REGULAR MEETING OF THE CITY OF CONCORD PLANNING COMMISSION

Wednesday, June 3, 2015
7:00 p.m. – Council Chamber
1950 Parkside Drive, Concord

Planning Commission Members:
Robert Hoag, Chair
Ernesto A. Avila, Vice Chair
Jason Laub, Commissioner
Tim McGallian, Commissioner
Carlyn Obringer, Commissioner

REGULAR MEETING
7:00 p.m. – Council Chamber

I. ROLL CALL

II. PLEDGE TO THE FLAG

III. PUBLIC COMMENT PERIOD

IV. COMMISSION APPOINTMENTS

1. Nomination and designation of Bicycle and Pedestrian Advisory Committee Representative and Alternate for 2015/16.

V. ADDITIONS / CONTINUANCES / WITHDRAWALS

VI. CONSENT CALENDAR

1. 4/15/15 Meeting Minutes

VII. PUBLIC HEARINGS

1. **Step By Step Montessori School** **(PL150157 – UP) –** Application to operate a day care center for ages 3 months to 2.5 years old within an existing 1,220 sq. ft. building at the northeast corner of Clayton Road and Heather Drive on a .18-acre site at 4991 Clayton Road. The General Plan designation is Community Office; Zoning classification is CO (Community Office); APN 116-203-004. **Project Planner: Joan Ryan @ (925) 671-3370**

2. **Costco Fueling Facility Expansion (PL131208 – UP, DR) –** Application for a Use Permit Amendment and Design Review to add one additional multi-product dispenser to all four existing fueling islands and to expand the existing gas canopy/roof by approximately 4,320 sq. ft. for the Costco Fueling Facility at 2400 Monument Boulevard. The General Plan designation is Regional Commercial; Zoning classification is RC (Regional Commercial); APN 129-040-010. **Project Planner: Frank Abejo @ (925) 671-3128**

VIII. ADDITIONS / CONTINUANCES / WITHDRAWALS

IX. COMMISSION CONSIDERATIONS

X. STAFF REPORTS / ANNOUNCEMENTS

XI. COMMISSION REPORTS / ANNOUNCEMENTS

XII. FUTURE PUBLIC HEARING ITEMS

XIII. ADJOURNMENT

NOTICE TO PUBLIC

ADA ACCOMMODATION

In accordance with the Americans With Disabilities Act and California Law, it is the policy of the City of Concord to offer its public programs, services and meetings in a manner that is readily accessible to everyone, including those with disabilities. If you are disabled and require a copy of a public hearing notice, or an agenda and/or agenda packet in an appropriate alternative format; or if you require other accommodation, please contact the ADA Coordinator at (925) 671-3031, at least five (5) days in advance of the hearing. Advance notification within this guideline will enable the City to make reasonable arrangements to ensure accessibility.

APPEALS

Decisions of the Planning Commission on use permits, variances, major subdivisions, appeals taken from decisions of the Zoning Administrator or staff interpretations of the Zoning Code may be appealed to the City Council. Appeals and the required filing fee must be filed with the City Clerk within ten (10) days of the decision.

APPLICANT'S SUBMITTAL OF INFORMATION

Submittal of information by a project applicant subsequent to the distribution of the agenda packet but prior to the public hearing may result in a continuance of the subject agenda item to the next regularly scheduled Planning Commission meeting, if the Commission determines that such late submittal compromises its ability to fully consider and evaluate the project at the time of the public hearing.

CONSENT CALENDAR

All matters listed under CONSENT CALENDAR are considered by the Commission to be routing and will be enacted by one motion. There will be no separate discussion of these items unless requested by a Commissioner prior to the time Commission votes on the motion to adopt.

CORRESPONDENCE

Correspondence and writings received within 72 hours of the scheduled Planning Commission meeting that constitute a public record under the Public Records Act concerning any matter on the agenda is available for inspection during normal business hours at the Permit Center located at 1950 Parkside Drive, Concord. For additional information contact the Planning Division at (925) 671-3152.

HEARINGS

Persons who wish to speak on hearings listed on the agenda will be heard when the hearing is opened, except on hearing items previously heard and closed to public comment. Each public speaker should limit their comments to three (3) minutes or less. The Chair may grant additional time. The project applicant normally shall be the first person to make a presentation when a hearing is opened for public comment. The project applicant's presentation should not exceed ten (10) minutes unless the Chair grants permission for a longer presentation. After the public has commented, the item is closed to further public comment and brought to the Planning Commission level for discussion and action. Further comment from the audience will not be received unless requested by the Commission. No public hearing or hearing shall commence after 11:00 p.m. unless this rule is waived by majority vote of the Commission.

MEETING RECORDS

Planning Commission meetings are available for viewing on the City's website, www.cityofconcord.org and at the Concord Public Library. Copies of DVDs of the Planning Commission Meeting are available for purchase. Contact the Planning Division at (925) 671-3152 for further information.

NOTICE TO THE HEARING IMPAIRED

The Council Chamber is equipped with Easy Listener Sound Amplifier units for use by the hearing impaired. The units operate in conjunction with the Chamber's sound system. You may request the Easy Listener Phonic Ear Personal Sound Amplifier from the staff for personal use during Commission meetings.

ROUTINE AGENDA ITEMS AND CONTINUED ITEMS

All routine and continued items will be considered by the Planning Commission at the beginning of the meeting. There will not be separate discussions of these items unless a request is made prior to the time the Planning Commission considers the motions.

SPEAKER'S CARD

Members of the audience who wish to address the Planning Commission should complete a speaker's card available in the lobby or at the front bench. Submit the completed card to staff before the item is called, preferably before the meeting begins.

TELEVISED MEETINGS

All Planning Commission meetings are broadcast live on Astound Broadband channel 29 and Comcast channel 28. The meeting is replayed on the Thursday following the meeting at 8:00 a.m., 2:00 p.m. and 8:00 p.m. Replays are also broadcast on Fridays and Saturdays. Please check the City website, http://www.cityofconcord.org/about/citynews/tvlistings.pdf or check the channels for broadcast times.

NEXT PLANNING COMMISSION MEETINGS:

June 17, 2015: 7:00 pm – Council Chamber
July 1, 2015: 7:00 pm – Council Chambers

Concord **REPORT TO PLANNING COMMISSION**

DATE: June 3, 2015

SUBJECT: STEP BY STEP MONTESSORI SCHOOL (PL1500157 - UP)

Recommendation: Adopt Resolution No. 15-05PC, approving a Use Permit (PL1500157 - UP) for Step by Step Montessori School.

I. Introduction

A. Application Request

Application for a Use Permit to establish a day care center for children ages 3 months to 30 months within an existing 1,220 sq. ft. building at the northwest corner of Clayton Road and Heather Drive on a 0.18-acre site.

B. Location

The project site is located at 4991 Clayton Road; APN 116-203-004.

C. Applicant
Betta Group, Inc.
Attn: Ashur Abbasi
2053 Lincoln Ave., #A
San Jose, CA 95125
(408) 267-7190

Owner
Ali Haghighi
704 Solana Drive
Lafayette, CA 94549
(925) 283-3513

II. Background

Since 2005, the owner has been operating 1507 Heather Drive as Step by Step Montessori Preschool, a child care center (UP 55-77) of 1,846 sq. ft. in size that provides care to 40 children ages 2 to 6. The owner is interested in opening a companion child care center at the subject site for younger children ages 3 months to 30 months because she has recognized a real need for care for this specific age range. The subject site at 4991 Clayton Road is next door to the current 1507 Heather Drive facility, and was purchased by the owner in December 2014.

On March 13, 2015, Ali Haghighi on behalf of the Betta Group Inc. submitted a pre-application to operate a child care center for 24 children within the existing building at 4991 Clayton Road. City staff held a Development Advisory Committee meeting on March 31, 2015 and determined that the parking situation presented too few spaces to accommodate the use. On April 22, 2015, the applicant discussed a revised plan with the City's Transportation Manager that provided four (4) more parking spaces by re-orienting the size and location of the play yard (to increase the parking to 8 spaces), and City staff determined that the solution was acceptable.

On April 28, 2015, Ali Haghighi submitted a formal application (Exhibit B) for a Use Permit to establish a child care center to accommodate 24 children ages 3 months to 30 months within the existing building at 4991 Clayton Road. The revised plans (Exhibit C) reflect the increased parking spaces. The City's Development Advisory Committee reviewed the plans on May 12, 2015, and deemed the application complete on May 22, 2015. A neighborhood meeting was held on May 20, 2015, however no neighbors attended the meeting.

III. General Information

A. General Plan

The General Plan designation is Community Office.

B. Zoning

The site is zoned Community Office.

C. CEQA Status

Pursuant to the provisions of the California Environmental Quality Act (CEQA) of 1970, as amended, and pursuant to CEQA Regulations Section 15301 "Existing Facilities," the project is classified as a Class 1 Categorical Exemption, and therefore, no further environmental review is required.

D. Site Description

An existing office building is located on the eastern side of the property. An existing parking lot is located on the western portion of the property. A handicapped access ramp provides access to the western side of the building from the parking area. The parking area is accessed from a driveway on Clayton Road. Lawn and landscaping currently exist on the southern and eastern perimeter of the site along Heather Drive and Clayton Road. A few fruit trees are located along the northern and western property lines. Two small accessory structures exist on the north side of the property.

Lot Size and Dimensions	8,110 sq. ft. (approx.)	91 ft. x 88 ft. (approx.)
Existing Improvements	1,220 sq. ft. office building, accessory structures, parking lot, fencing and landscaping.	
Topography	The parcel generally flat.	
Existing Vegetation	Trees, small shrubs, and lawn along the perimeter of the site and adjacent to the building.	

E. Surrounding Land Use

The site is surrounded by the following uses:

	Land Use	General Plan Designation	Zoning
North	Child Care facility	Low Density Residential	RS-8
East	Office	Community Office	CO
South	Condominiums	Medium Density Residential	PD
West	Residential	Low Density Residential	PD

IV. Detailed Project Description

A. Development Regulations

The following table lists the Community Office zoning district regulations compared to the proposed project. The project complies with the development standards.

Standards	Required	Provided
Lot Area (minimum square feet)	10,000	8,110
FAR (maximum)	1.0	0.15
Setbacks (minimum feet)		
Front yard	10	19'-8"
Side yard	5	47'-3"
Corner side yard	10	17'-10"
Rear yard	5	21'-3"
Landscaping (% coverage)	20	20%
Building Height (maximum feet)	30	Approx. 24'
Parking Spaces	7	8

B. Description of Business

The Step by Step Montessori School for the younger children on the subject site is proposed with a maximum capacity for 24 children. Business hours will be Monday through Friday from 7:00 a.m. to 6:00 p.m. Due to the schedules of parents, drop off and pick up times would be staggered during the early morning and afternoon. The school would employ 4 employees at the site. One of the four employees also serves as the site director that oversees both properties. Her office is located at the adjacent facility. The floor plan indicates two toddler rooms, two infant rooms, three restrooms and a reception area. A 1,080 sq. ft. playground would be located on the north side of the subject property and also on a portion of the adjacent 1507 Heather Drive lot (also owned by the owner). The adjacent parcel has a separate play area on the western side of that lot and would not share the new proposed outdoor play area on the subject lot. Outdoor play would typically take place at the subject site in the morning 8:30-9:00 a.m., after lunch at 12:30-1:00 p.m., and in the afternoon from 3:00-4:00 p.m.

V. Discussion

A. General Plan

The site's General Plan land use designation of Community Office allows a mix of small scale single and multiple tenant businesses, professional, and medical offices in low-rise buildings that are compatible with adjacent residential areas.

The project is consistent with policies contained in the General Plan. The child care center school would be consistent with Policy LU-4.2.2, which encourages Concord to provide sites for urban scale development including both amenities and services for workers and residents. In addition, the proposed use would be consistent with Policy PF-2.2.3 to "Continue to respond to the growing need for child care facilities and programs as a result of new residential, office, commercial, and industrial development, and allow child care facilities in all zoning districts." For these reasons, staff finds the proposed project consistent with the Community Office land use designation and the policies within the General Plan.

B. Zoning

The site is zoned Community Office (CO). The proposed use would fall under the "Child day care" use classification in the Development Code; that classification includes "Nursery school, preschool, and childcare" and means commercial or nonprofit child day care facility designed and approved to accommodate 15 or more children. Examples include nursery schools, preschools, and day care facilities. These may be operated in conjunction with a school or church facility, or as an independent land use." Such facilities are permitted in the CO zoning district subject to a Use Permit.

C. Site Planning/Circulation/Parking

Step by Step Montessori School will occupy an existing office building with adjacent parking and loading area. Vehicles will enter the parking lot from Clayton Road, park in one of five spaces available to parents to unload children into the building and then exit the site onto

Clayton Road. Vehicles with employees will park in one of three designated spaces: the two northern parking spaces and the space in front of the building. A portion of the northern side of the lot will be gated and fenced for use as an outdoor play yard. New striping for seven parking spaces, including one handicapped space and an accessible path of travel, will occur along the western edge of the site. An eighth space is proposed at the front of the building to be designated for employee parking. There is no vehicular circulation planned between the two parcels with common ownership.

Discussion

The Transportation Division and the Fire District reviewed the site plan and circulation pattern and determined the type of facility will generate relatively few trips to and from the site and requires only minor changes or improvements to the parking lot. The Fire District confirmed that the building will need to be protected with an approved automatic fire sprinkler system, due to the change of use.

Parking Requirements

	Parking Ratios	Required	Proposed
Parking by Land Use (Section 18.160.040A)	(1 space/6 children) *24 children*	4	4
Child Day Care facilities (Section 18.200.050D)	(1 space/per employee) *4 employees*	4	3[1]
Child Day Care facilities (Section 18.200.050D)	Loading area (off-street)	Yes	Yes

[1] The director (owner) will split her time between the two sites and will park at the adjacent site. Thus, three additional spaces can be provided.

Section 18.160.040A (Parking Requirements) requires 1 space per 6 children plus a loading area. Based on the requirement, four (4) parking spaces would be required for the 24 children at the site. In addition, Section 18.200.050D (Child Day Care facilities) requires a minimum of one (1) off-street parking space per employee. Based on this requirement, four spaces would typically be required. However, the facility director (owner) will split her time between the two sites and will park at the adjacent site. However, three additional spaces are provided. Section 18.200.050D requires that a safe loading area for pick-up and delivery of children shall be provided, and shall only be allowed in a driveway, in an off-street parking area, or other on-site area with direct access to the facility. The planned loading area is within the off-street parking area, within close proximity to the entry, in the parking space adjacent to the handicapped parking space.

Parents or responsible parties will be instructed to park within the specific designated loading area or if unavailable, one of the other (4) non-employee parking spaces within the parking lot. Pick-up times vary by child and are not expected to create conflicts. Staff concludes the parking lot design, drive aisle dimensions, vehicle-turning radii, loading/unloading area, the number of parking stalls, and available parking for pick-ups is appropriate for the project. Staff has included a condition for the applicant to include within their service agreement with

parents a description of the parking requirements, rules and regulations in terms of where to park, and that parents be provided a copy of the agreement for their signature when they sign up for child care service. Employee spaces have also been conditioned to be labeled.

D. Building Architecture

The single story building is residential in appearance, one story with wood siding and composition shingle roof material. No addition to the building is proposed. Other minor modifications are proposed including the addition of fire sprinklers and re-painting of the building to a light sand color.

Discussion
A new ramp will be required to the outside play area to allow access by children of all abilities, and thus an ADA access ramp has been included within the conditions of approval by the Building Division. Staff finds the scope of changes minor in nature and appropriate as proposed.

E. Landscaping/Walls/Fencing

Perimeter landscaping consists of mature trees, low shrubs, and lawn. An existing 16-inch oak tree is located within the proposed outdoor play yard. A number of fruit trees exist on the northern and western property line, within a 2-3 foot wide planting area. Good neighbor fences are located on the northern and western property lines. The applicant proposes to provide minor modifications and maintenance of the site including the addition of the outdoor play area and fencing around it, infill of a small 200 sq. ft. landscape area adjacent to the driveway.

Landscaping

New landscaping is proposed within a 200 sq. ft. area adjacent to the handicap accessible parking space in the parking area. Staff has conditioned the landscaping to be drought tolerant.

Discussion

Due to the amount of lawn already located at the site, staff has conditioned the project to provide drought tolerant landscaping for any new landscaping of the site (small area adjacent to the handicapped space).

Walls and Fencing

The City's transitional requirements provide standards for additional setbacks, screening, and landscaping to provide an appropriate transition between abutting properties. The transitional fence and wall requirements section of the code requires all uses with "outdoor operations to provide a six to eight foot wall unless otherwise approved by the Review Authority."

Discussion

Step by Step Montessori School proposes an outdoor play area on the northern side of the property. The play area would be screened with a 6-foot tall premium redwood fence. The play area is approximately 40 feet from the western property line shared by the adjacent residential neighborhood. The western property line is straddled by two existing wood fences, one approximately 5 feet high and one approximately 7 feet high. Constructing a wall to screen the outdoor play area or along the property line would be inappropriate in this particular case, given the age of the children, location of the play area, and existing of the two parallel fences already located on the western property line, and given the play area will be closest to the front yards of Silverleaf Court, not the rear yards. Staff will monitor the use and investigate neighborhood complaints if necessary however there is no history of objections from the adjacent subdivision nor did they raise concerns at the neighborhood meeting.

F. Signs

The applicant plans to replace the remnants of a previous freestanding sign with a new freestanding sign on Clayton Road that reads "Step by Step Montessori School" including the site address. A second similar wall sign may be proposed along the Heather Drive frontage. Both signs will be reviewed at the time of building permit submittal.

Discussion

The sign regulations allow both a wall sign and freestanding sign in the CO District. The signs are limited to a total of 8 sq. ft. with the free standing sign limited to 5 ft. in height. Staff has included a condition, noting that a building permit will be required for the two signs, one of which is expected on Clayton Road is approximately 6 sq. ft., with the address number (4991) incorporated into the sign. An additional wall sign of up to 2 sq. ft. would be allowed on the building façade facing, Heather Drive, if requested.

VI. Fiscal Impact

The proposed project would have a negligible fiscal impact on the City.

VII. Public Contact

Notification was mailed to all owners and occupants of property within three-hundred (300) feet of the subject parcel, and has been published in the Contra Costa Times, as required by the Concord Municipal Code. This item has also been posted at the Civic Center and at the subject site at least 10 days prior to the public hearing.

VIII. Summary and Recommendations

The proposed Step by Step Montessori School is consistent with the applicable goals and policies of the Concord 2030 Urban Area General Plan concerning schools and educational opportunities for the City's residents. The project is consistent with General Plan Policy PF-2.2.3 to "Continue to respond to the growing need for child care facilities and programs as a result of new residential, office,

commercial, and industrial development, and allow child care facilities in all zoning districts. The proposed use is also consistent with Development Code requirements. The proposed improvements will upgrade the site and be compatible with the character of the existing neighborhood. Furthermore, with the conditions of approval the project will not be detrimental to the health, safety and general welfare of persons residing or working in the neighborhood of such project.

Staff recommends the Planning Commission open the public hearing, consider the staff report and presentation by the applicant, the public testimony, and close the hearing upon completion of public testimony. Staff recommends the Commission adopt Resolution No. 15-05PC approving a Use Permit for Step by Step Montessori School.

IX. Motion

Project Approvals

I (Comm. _____) hereby move that the Planning Commission adopt Resolution No. 15-05PC approving Step by Step Montessori School Use Permit (PL1500157 – UP), subject to the Conditions of Approval set forth in Attachment A to Resolution 15-05PC. (Seconded by Comm. _____.)

Prepared by: _____
Joan Ryan, AICP
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(925) 671-3370
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Reviewed by: _____
Laura Simpson
Planning Manager
(925) 671-3369
Laura.simpson@cityofconcord.org

Exhibits:

A - PC Resolution No. 15-05PC, Conditions of Approval (Attachment A)
B - Applicant's written statement date-stamped received March 13, 2015 and April 24, 2015
C - Applicant's plan sheets date stamp received May 27, 2015

15srpc.022

EXHIBIT A

BEFORE THE PLANNING COMMISSION
OF THE CITY OF CONCORD,
COUNTY OF CONTRA COSTA, STATE OF CALIFORNIA

A RESOLUTION APPROVING STEP BY STEP MONTESSORI SCHOOL USE PERMIT (PL1500157 - UP)

Resolution No. 15-05PC

/

WHEREAS, on April 28, 2015, Ali Haghighi, on behalf of the Betta Group, Inc., submitted an application for a child care center to accommodate 24 children ages 3 months to 30 months within an existing 1,220 sq. ft. building on a 0.19-acre site at 4991 Clayton Rd., APN 116-203-004; and

WHEREAS, on May 22, 2015 the application was deemed complete for processing; and

WHEREAS, pursuant to the provisions of the California Environmental Quality Act (CEQA) of 1970, as amended; the project is classified as Categorically Exempt pursuant to Section 15301 "Existing Facilities," and therefore no further environmental review is required; and

WHEREAS, the Planning Commission, after giving all public notices required by State law and the Concord Municipal Code, held a duly noticed public hearing on June 3, 2015 the subject proposal; and

WHEREAS, the Planning Commission considered testimony and information received at the public hearing and the oral and written reports from City staff dated June 3, 2015, as well as other documents contained in the record of proceedings relating to the proposed project, which are maintained at the offices of the City of Concord Planning Division ("Project Information"); and

WHEREAS, on June 3, 2015 the Planning Commission, after consideration of all pertinent plans, documents and testimony, declared their intent to approve the subject proposal subject to the Conditions of Approval contained herein as Attachment A.

NOW, THEREFORE, BE IT RESOLVED AS FOLLOWS: that the Planning Commission does hereby approve Use Permit (PL1500157 - UP) subject to the Conditions of Approval and further makes the following findings:

CEQA

1. The project is not subject to additional environmental review pursuant to the provisions of the California Environmental Quality Act (CEQA) of 1970, as amended, and pursuant to Section 15301"Existing Facilities," the project is classified as a Class 1 Categorical Exemption.

Use Permit

1. *The proposed use is allowed within the applicable zoning district and complies with all other applicable provisions of the development code and the CMC.* The proposed use is a Childcare Facility, which is an allowed use within the CO (Community Office) Zoning District, with the approval of a Use Permit. The project meets standards for floor area ratio, setbacks, and building height of CO zoning, satisfies applicable requirements under Development Code, Division IV, General Development Standards, and complies with all other applicable provisions of the Development Code and Concord Municipal Code. The project complies with Section 18.160.040A of the development code requiring one parking space per 6 children and Section 18.200.050D which requires one parking space per employee and a safe off-street loading area, as described on page 5 of the staff report.
2. *The proposed use is consistent with the general plan.* The project provides a child care facility in an area predominated by office uses, residential uses, and other child care uses and is thus consistent with the intent of the Community Office Land Use designation that allows a mix of small scale single and multiple tenant businesses, professional, and medical offices in low-rise buildings that are compatible with adjacent residential areas. Additionally, the project is consistent with General Plan policies encouraging Concord to provide sites for urban scale development including both amenities and services for workers and residents (Policy LU-4.2.2), continuing to respond to the growing need for child care facilities and programs as a result of new residential, office, commercial, and industrial development, and allow child care facilities in all zoning districts (Policy PF-2.2.3), and actively seeing and encouraging the development of childcare facilities to help female-headed households, especially those with extremely low, very

low, low or moderate incomes (Policy H-3.4).

3. *The design, location, size and operating characteristics of the project are compatible with existing and future uses in the vicinity.* The project's design, location, size, and operating characteristics comply with the applicable standards related to circulation, access, parking, landscaping, drainage, building design, etc., to ensure compatibility with existing and future uses in the vicinity, such as the adjacent residential, child care and offices in the vicinity.
4. *The project site is physically suitable for the type, density and intensity of the proposed use, including access, utilities, and absence of physical constraints.* The project site is large enough to accommodate the child care facility and includes existing site access and utility service.
5. *Granting the Use Permit will not be detrimental to the public health, safety, or welfare of the persons residing or working in the subject neighborhood or materially detrimental or injurious to property or improvements in the vicinity and Zoning District where the property is located.* The proposed child care facility is allowed with a Use Permit by the CO (Community Office) zoning district that applies to the property. The project will not be detrimental to the public health, safety, or welfare of persons residing or working in the neighborhood because it will meet or exceed the applicable development standards to ensure setbacks, landscaping, parking, and other project features are appropriate for the area.
6. Project conditions and requirements will ensure on-going operations will not impact adjacent properties and maintenance of the building exteriors, parking lot, and landscaping will be secured through a separate property maintenance agreement.

<u>Transitional Requirements</u>

7. A six-foot tall redwood fence adjacent to the outdoor play area will provide adequate screening and buffering of the play yard and between properties and constructing a wall in its place is unnecessary to protect neighboring properties because they are setback from the play area by approximately 40 feet and two existing fences already straddle the western property line shared with the residential neighborhood.

Measure J

8. The project supports the following Growth Management Element policies and is therefore compliant with Measure "J".

a. Policy GM-1.1.1 because the project is an urban development located within the City's Urban Limit Line.

b. Policy GM-2.1.1 because the project results in urban infill development.

c. Policies GM-7.2.1 through GM-7.2.3 because the project's impact on public services and facilities are reduced by conditions of approval, proportionate to the project's demand on public services and facilities, including traffic impact, parkland, and sewer.

9. The Planning Commission does hereby approve Use Permit (PL1500157 - UP) subject to the Conditions of Approval.

Effective Date

In accordance with City of Concord Municipal Code Section 18.500.080, approvals or other decisions of the Planning Commission shall become effective on the 11th calendar day following the date the decision is rendered, if no appeal is filed ("Date of Decision").

PASSED AND ADOPTED this 3rd day of June, 2015, by the following vote:

AYES: Commissioners

NOES: Commissioners

ABSTAIN: Commissioners

ABSENT: Commissioners

_____
Laura Simpson
Secretary to the Planning Commission

Attachment:
A –Draft Conditions of Approval

cc: Robert Ovadia, City Engineer
Robert Woods, Building Division
Captain Robert Marshall, Contra Costa County Fire Protection District

ATTACHMENT A
DRAFT
CONDITIONS OF APPROVAL
STEP BY STEP MONTESSORI SCHOOL
PL1500157 - UP
4991 Clayton Road
APN 116-203-004

PERMIT DESCRIPTION

1. These Conditions apply to and constitute the approval of a **Use Permit (PL1500157 - UP)** for a **child care center to accommodate 24 children, ages 3 months to 30 months, within an existing 1,220 sq. ft. building on a 0.19-acre site at 4991 Clayton Rd.**

2. Exhibits date stamped received by the City of Concord on **May 27, 2015** are approved and shall be incorporated as Conditions of Approval.

GENERAL CONDITIONS

3. **The hours of operation shall be Monday through Friday from 7:00 a.m. to 6:00 p.m.** ***(PLNG)***

4. **Students shall be closely supervised by parents within the parking area and the pick-up and drop-off area. The applicant/owner shall provide parent with the parking and drop off rules within the school's Rules and Regulations and have parents or care takers sign an acknowledgement of the rules in particular regarding parking, drop-off and pick-up, upon signing up for service. Employee spaces shall be designated through signage at each of the spaces. Loading area for pick-up and drop-off shall also be designated and a minimum of 10 feet wide.** ***(PLNG)***

5. **Student enrollment shall be limited to 24 students.** ***(PLNG)***

6. **Three of the parking spaces at the subject site, shall be designated for employees, with the assumption that the director of both facilities will park on the adjacent site (Heather Drive). Employees shall park in designated employee spaces. The space adjacent to the handicapped space shall be designated as the loading area for pick-up/drop-off.** ***(PLNG)***

7. **The applicant shall provide required access to the enclosed outdoor yard area, adjacent to the north side of the building, via a ramp compliant with ADA requirements, such that access to playground area can be accomplished from within the building, without passing through the parking lot.** ***(BLDG)***

8. **One bathroom and one shower must be ADA compliant, or shower can be removed, or compliance hardship may be filed.** (***BLDG***)

9. The Conditions are the responsibility of the applicant and all contractors. Compliance shall occur as specified in the Conditions or at one of the following project milestones:
   a. With the submittal of Grading, Improvement, Landscape, or Building Plans.
   b. Prior to issuance of Encroachment, Grading, or Building Permits, whichever comes first.
   c. Prior to Construction.
   d. On-going during Construction.
   e. Prior to approval of the Final Map.
   f. Prior to occupancy approval.

   If timing for compliance is not specified, it shall be determined by the Divisions listed after the Condition. ***(PLNG, BLDG, ENGR)***

10. Where a plan or further information is required, it is subject to review and approval by the applicable City Department/Division, as noted at the end of each Condition. The Division listed first shall be the primary contact for implementation of that Condition. ***(PLNG, BLDG, ENGR)***

11. The project shall comply with all applicable Federal and State laws and Concord Municipal Code (CMC) requirements. ***(PLNG, BLDG, ENGR)***

12. Minor modifications that are found to be in substantial conformance with the approved plans such as colors, plant materials, or minor lot line adjustments, may be approved administratively. Major modifications shall be approved by the applicable decision making body. ***(PLNG, ENGR)***

13. The Conditions of Approval shall be listed on a plan sheet that is included in the plan set (Building, Site and Landscape Plans). ***(PLNG, ENGR, BLDG)***

14. Two annotated copies of the Conditions of Approval specifying how each applicable condition has been satisfied, shall be submitted as follows:
   a. At the time Grading, Building, and/or Landscape Plans are submitted for plan check, whichever comes first; and
   b. Prior to occupancy approval. ***(PLNG, ENGR)***

15. Submit three signed copies, one notarized, of the City's "Property Maintenance Agreement", to ensure on-going repair, replacement and maintenance of all exterior improvements including the storm drain outside of the public street right of way, parking lot lights, other privately maintained improvements, buildings, parking areas, walkways, landscaping, irrigation, signs, fences, and other improvements, prior to the issuance of a building permit. ***(PLNG, ENGR, BLDG)***

16. The project site and area surrounding the site shall be maintained in a weed and litter free condition for the period prior to construction. ***(BLDG, PLNG)***

17. The applicant shall have 90 days to arrange for the re-orientation of parking and play area should the adjacent site be sold (1507 Heather Drive), or staff may consider a reduction in the number of children served. ***(BLDG, PLNG)***

18. Modify occupancy type to I-4, from B, on the site plan for submittal to the Fire District. This also triggers the need for the building to be installed with fire sprinklers (***BLDG, FD***).

ARCHITECTURAL

19. **The applicant shall submit the final building colors to staff for review and approval prior to painting the building and prior to the issuance of any grading or building permits.** ***(PLNG)***

20. Rooftop equipment (HVAC, meters, refrigeration equipment, plumbing lines, ductwork and transformers), shall not extend above the building parapet and shall be screened from view on all sides with materials architecturally compatible with the main structure. Screening details shall be shown on the Building Plans and submitted for review and approval by the Planning Division, prior to the issuance of Building Permits and installed prior to occupancy approval. ***(PLNG)***

21. Vents, gutters, downspouts, flashing, electrical conduits, etc., shall be painted to match the color of the adjacent surface, unless otherwise approved by the Planning Division. ***(PLNG)***

LANDSCAPING

22. **The applicant shall provide a preliminary landscape plan indicating the planting to occur at the site. All new planting should be drought tolerant and designed for low water use, and be approved by staff prior to the issuance of a building permit. Fence detail for the outdoor play area shall be included with the landscape plan. A small 3-foot tall decorative fence, painted to match building, shall be installed at back of new planting area.** ***(PLNG)***

23. All landscaping shall be installed prior to occupancy approval. Contact the Planning Division at least two weeks prior to Occupancy, to request a site inspection of all exterior improvements

including buildings, driveways, parking lots, landscaping, irrigation, lighting, and walls. ***(PLNG)***

LIGHTING

24. All exterior building and parking lot lighting shall provide illumination for safety and shall be installed in a manner that is glare shielded and directed away from adjacent properties and right-of-ways. ***(PLNG)***

SIGNAGE

25. All signage shall comply with the City of Concord **Sign Regulations and the CO District standards**. ***(PLNG)*** **CMC**

26. All freestanding signs shall be setback a minimum of five feet from a public right-of-way. ***PLNG (CMC)***

27. Pennants, banners, streamers, or flags in connection with special promotions and business openings shall be permitted for a period not to exceed 30 days. The same, different, or similar pennants, banners, streamers, and flags shall not be permitted within 150 calendar days after such removal. No pennants, banners, streamers, balloons, inflatable devices, flags, or any other advertising devices shall be mounted on or above any roof or mansard, or otherwise extend above a parapet wall or ridge of a structure. ***(PLNG, NS)*** **CMC**

28. The applicant shall submit construction plans for all signage showing the details of the installation, dimensions, font, and materials and colors for review and approval prior to the issuance of a Sign Permit. ***(PLNG)***

PARKING

29. Parking shall comply with Division 3 of the City's Development Code, "Parking, Loading, and Access" including parking spaces, drive aisle and parking space dimensions, turning radii, back-out dimensions, driveway clearances, landscape median dimensions, and other relevant information. Applicant shall submit a restriping and signing plan of the parking lot showing handicapped parking, loading area (10 feet wide) and five additional spaces along the western boundary with an additional parking space in front of the building. Employee parking shall be designated. ***(ENGR, PLNG)*** **CMC**

30. Handicapped parking spaces shall comply with Chapter 11 "Site Development Requirements for Handicapped Accessibility" of Title 24 of the California Code of Regulations, and be located as close as possible to the primary entrance. ***(BLDG)***

CONSTRUCTION PLAN REVIEW/PRE-PERMIT REQUIREMENTS

31. Submit two copies of Preliminary Title Report, prepared within three months prior to plan submittal. Show all easements and vesting information on site plan. ***(ENGR)***

32. The Improvement Plans shall show frontage improvements including but not limited to: drainage improvements, curb, gutter and sidewalk per City Standard Detail S-10, and driveway construction per City Standard Detail S-14 and repair/replacement of deficient frontage improvements as determined by the City Engineer. Any unusable existing driveway shall be replaced with standard curb, gutter, and sidewalk per S-10 above. Any trenching for utility installation shall comply with the modified City Standard Detail S-17 for pavement repair and possible slurry placement. ***(ENGR)***

33. Design improvements in accordance with the City Standard Plans S-34 and S-36 for sight distance, sidewalk, back up, fencing, geometrics at intersection and corner setback requirements, prior to the Acceptance of Improvements. Plans shall be subject to review and approval by Engineering Services. ***(ENGR)***

34. Obtain an Encroachment Permit from the City prior to performing any work within the public right-of-way or public easements. ***(ENGR) CMC***

STREET IMPROVEMENTS

35. Reconstruct deficient frontage improvements as determined by the City Engineer along the frontage on **Clayton Road**, including but not limited to: driveway removal; wheel chair ramps; curb, gutter and sidewalk; ADA compliant concrete driveway approach; storm drainage system; conforms to existing improvements prior to occupancy approval or Acceptance of Improvements. ***(ENGR)***

36. Construct all public facilities in accordance with the current Americans with Disabilities Act (ADA), including driveways and curb ramps. ***(ENGR)***

NOISE

37. Noise producing site preparation and construction activities shall be limited to the days and hours as set forth below:

    Monday through Friday.....7:30 a.m. to 6:00 p.m.

    Construction on Saturdays may be allowed only upon prior approval by the Building, Engineering, and Planning Divisions. No changes to these construction hours shall be allowed without the prior written consent of the City. A contact person shall be available during all construction activities in the evening and on weekends to respond to complaints and take actions necessary to reduce noise. ***(BLDG, ENGR, PLNG)***

CONSTRUCTION ACTIVITIES

38. Contact Engineering Services to arrange for a Pre-Construction Meeting prior to issuance of Grading or Building Permits, whichever comes first. ***(ENGR)***

39. Implement a dust and construction noise control plan. Submit the plan to Engineering Services for review and approval prior to issuance of the Grading Permit. ***(ENGR)***

40. Construction equipment shall not be serviced at the site at any time. During construction, no deliveries shall be made to the site and no delivery vehicles (including gasoline tanker trucks) shall enter the site between 6:00 p.m. and 7:30 a.m. on weekdays, and between 5:00 p.m. and 8:00 a.m. on weekends and federal holidays. Delivery vehicles shall have their engines turned off during unloading. ***(BLDG, ENGR, PLNG)***

41. Employ the quietest construction equipment available, to muffle noise from construction equipment and keep all mufflers in good working order in accordance with State law. ***(BLDG, ENGR, PLNG)***

42. Implement the following measures during construction:
    a. Gather all construction debris on a regular basis and place them in a dumpster or other container that is emptied or removed on a weekly basis. When appropriate, use tarps on the ground to collect fallen debris or splatters that could contribute to storm water pollution.
    b. Remove all dirt, gravel, rubbish, refuse, and green waste from the street pavement, and storm drains adjoining the project site. During wet weather, avoid driving vehicles off paved areas.
    c. Broom sweep the public street pavement adjoining the project site on a daily basis. Caked-on mud or dirt shall be scraped from these areas before sweeping.
    d. Install filter materials (e.g., sandbags and filter fabric) at the storm drain inlet nearest the downstream side of the site in order to preclude any debris or dirt from flowing into the City storm drain system. Filter materials shall be maintained and/or replaced as necessary to ensure effectiveness and to prevent street flooding. Dispose of filter particles in an approved trash receptacle.
    e. Create a contained and covered area on the site for the storage of bags, cement, paints, flammable, oils, fertilizers, pesticides, or any other materials used on the site that have the potential for being discharged to the storm drain system by being windblown or in the event of a material spill.
    f. Never clean items such as machinery, tools, and brushes or rinse containers in a street, gutter, or storm drain.
    g. Ensure that concrete, gunite, plaster, or similar supply trucks do not discharge wash water into street gutters or drains. ***(ENGR, BLDG)***

43. No equipment shall be started or staging area be established on the streets or the site before or after the specified hours of construction. ***(ENGR, BLDG)***

44. Ensure that no debris or construction scrap material is placed on any adjoining lot, open space area, or street, and that any such material stored on an adjoining site shall be completely removed and the site cleaned, prior to occupancy approval. ***(ENGR, BLDG)***

45. At no time shall campers, trailers, motor homes, or any other vehicle be used as living or sleeping quarters on the construction site unless authorized for site security. ***(ENGR, BLDG)***

46. There shall be no parking of construction equipment or construction worker's vehicles on residential streets at any time; all vehicles shall be maintained on-site. ***(ENGR, BLDG)***

47. Portable toilets used during construction shall be kept as far as possible from adjacent properties and shall be emptied on a regular basis as necessary to prevent odor. ***(ENGR, BLDG)***

GRADING/EROSION CONTROL/GEOLOGIC

48. All grading shall require a Grading and Drainage Plan prepared by a registered Civil Engineer, a Soils Report prepared by a registered Geotechnical Engineer and receipt of a Grading Permit approved by the City Engineer. The Grading Plans and Soils Report shall require review by the City's Geotechnical consultant with all costs to be borne by the applicant. ***(ENGR)***

49. Sweep or vacuum the parking lot(s) a minimum of once a month and prevent the accumulation of litter and debris on the site. Corners and hard to reach areas shall be swept manually. If sidewalks and/or the parking lot are pressure washed, debris must be trapped and collected to prevent entry into the storm drain system. No cleaning agent may be discharged into the storm drain. If any cleaning agent or degreaser is used, wash water shall be collected and discharged to the sanitary sewer, subject to the approval of the Central Contra Costa Sanitary District. ***(ENGR)***

50. Ensure that the area surrounding the project such as the streets stay free and clear of construction debris such as silt, dirt, dust, and tracked mud coming in from or in any way related to project construction. Areas that are exposed for extended periods shall be watered regularly to reduce wind erosion. Paved areas and access roads shall be swept on a regular basis. All trucks shall be covered. ***(ENGR)***

SOLID WASTE/RECYCLING

51. Comply with CMC Chapter 82, Solid Waste, Article V, Construction and Demolition (C&D) Waste Recycling, Sections 82-114 through 82-126, as applicable. ***(BLDG)***

AGREEMENTS, FEES, BONDS

52. All fees noted below are the fees currently in effect as of July 1, 2014 per the Resolution of Fees and Charges. The fees and charges are reviewed annually as part of the budget public

hearing process. Fee adjustments are based on a number of factors and vary depending on the type of fee:

Service-based fees are adjusted annually based on the San Francisco-San Jose-Oakland Area Consumer Price Index;

Improvement based fees (also called impact fees) are adjusted annually based on Engineering News Record Construction Cost Index (San Francisco Bay Area); and the

Parkland Fee is adjusted per Section 78-95 of the Concord Municipal Code.

The fees become effective as of the date set forth in Exhibit A of Resolution No. 78-6042, Fees and Charges for Various Municipal Services, as most recently amended and approved by the City Council. Persons interested in how a particular fee is calculated should contact the City Department administering the fee or the Finance Department. **(ENGR)**

53. Provide a **$500** cash deposit to the Planning Division to cover Condition Compliance costs, at the time of submittal of plans and documents to Engineering Services or the Building Division for plan check. Planning staff's time will be charged to this deposit for work performed to implement the Conditions of Approval, from the time of project approval to occupancy approval. The deposit will be placed in a refundable account and any unused funds will be returned upon completion. If the initial deposit is insufficient to cover actual costs, an additional deposit will be required. ***(PLNG)***

54. Pay a Document Imaging fee of **$64** to reimburse the City for implementation of the Document Imaging and File Retention programs, prior to issuance of Grading or Building Permits. ***(PLNG)***

55. All improvement agreements required in connection with said plans shall be submitted to and approved by the City and other agencies having jurisdiction over said project prior to issuance of the Building or Grading Permit, whichever comes first. ***(ENGR)***

56. Encroachment Permit Application:
    a. Pay the Filing Fee at the time of submittal of permit application, Improvement plans and supporting documents to City Engineering Services for review. The current fee is **$86.00**.
    b. Provide a restoration security before issuance of the Encroachment Permit. The security shall be in an amount sufficient to restore existing public improvements to a serviceable condition should development improvement activity cause damage. The amount of the security shall be determined by, and be in a form acceptable to the City Engineer.
    c. Provide a **$2,000.00** cash deposit to cover Condition Compliance costs at the time of submittal of plans and documents to Engineering Services for review. The deposit will be placed in a refundable account. Condition Compliance costs will be charged to this deposit over the life of the project permit and mitigation requirements. Any unused

funds will be returned at project completion. If the initial deposit is insufficient to cover actual costs, an additional deposit in an amount determined by the City Engineer will be required.

d. Provide a **$2,000.00** cash deposit to cover review of Improvement Plans, Grading Plans, Landscape Plans, Joint Trench Plans, Storm water Control Plans, and other pertinent documents at the time of first submittal of the documents to Engineering Services for review. The deposit will be placed in a refundable account. Review fees will be charged at the hourly rate of **$172.00**. Any unused funds will be returned at project completion. If the initial deposit is insufficient to cover actual costs, an additional deposit in an amount determined by the City Engineer will be required. ***(ENGR)***

57. Grading Permit Application:

a. Pay Grading Permit Fees at submittal of a Grading Permit application. The current fee is determined based on cubic yardage of cut and fill combined, or at the hourly rate of **$172.00** if the hourly rate is used.

b. Provide a **$1,000.00** cash deposit for Erosion Control prior to issuance of Grading Permit. The deposit will be placed in a refundable account. Any unused funds will be returned at project completion. If the initial deposit is insufficient to cover actual costs, an additional deposit in an amount determined by the City Engineer will be required.

c. Pay Stockpile and Erosion Control Monitoring fee prior to issuance of Grading Permit. The stockpile and erosion control monitoring fee is currently **$23.00** per calendar day and is collected for the life of the Grading Permit activity. ***(ENGR)***

OTHER/MISCELLANEOUS

58. Comply with the requirements of the Contra Costa County Health Department for the abandonment of existing septic tanks or wells. ***(ENGR) CMC***

59. Comply with the requirements of the Contra Costa Fire Protection District, in their letter dated **April 2, 2015, noting the change of building use from the B occupancy to an I-4 occupancy and the addition of automatic fire sprinklers.** Submit complete sets of plans and specifications to the Fire District for review and approval at:

Contra Costa County Fire Protection District
2010 Geary Road
Pleasant Hill, CA 94523

Plan review fees are assessed at that time. The City is not responsible for the collection of fees or enforcement of requirements imposed by the Fire District. ***(CCCFPD)***

60. The applicant shall defend, indemnify and hold harmless the City, its agents, officials, and employees from any claim, action or proceeding brought by a third party to set aside, annul, attack or otherwise void the permit. ***(PLNG)***

61. The permit and approval shall expire in ***one*** year from the date on which they became effective unless construction permits are obtained and work has begun. The effective date of the permit and approval is ***June 3, 2015***. ***(PLNG)***

62. A request for a time extension from the expiration date **(June 3, 2016)** can be considered if an application with required fee is filed at least 10 days before the original expiration date, otherwise a new application is required. A public hearing will be required for all extension applications, except those involving only Design Review. Extensions are not automatically approved. Changes in conditions, City policies, surrounding neighborhood, and other factors permitted to be considered under the law, may require, or permit denial. ***(PLNG)***

EXHIBIT B

Statement of intended business activity at 1449 Clayton Road Concord, California

The intended business at this location is a Childcare center for ages 3 months-2.5 years of age. This ages of children are kept in two Separate groups of infants and toddlers.

For infants, activities consist of quiet and active play, resting and relaxation, eating, diaper changes, individual attention, & being held by a care giver.

For toddlers, in addition to what is provided for infants, there will be educational sessions and play time inside/outside.

The onsite Child to Adult ratios are as follows: 4 infants: 1 teacher, and 6 toddlers: 1 teacher.

An on the job training aide will be available as a substitute for breaks and assisting when needed.

A total of 4 employees and the director will be working in the center.

The client base for the center are parents, other family members registered to drop off and pick up the children.

Parents drop off their children and pick up them up by their pre-determined & agreed upon schedule. This varies for each child depending on the parents' needs. Schedules are available for morning, or mid-day start and could be half, full or partial day attendance.

The Center will be open between the hours of 7AM until 6PM. Due to the various schedules for each child, the drop offs and pickups will create minimal traffic.

There are 4 parking spaces on site, with one specifically dedicated to loading and unloading, another for handicapped parking and 3 others for regular parking.

The owner, Marzi Haghighi, holds a director's license from State of California and Bachelors in Nutrition from SFSU with a focus on children's nutrition. She intends to help the nearby neighborhood with their child care needs and educate the young children to be well prepared for preschool level.

RECEIVED
MAR 13 2015
PERMIT CENTER

Ryan, Joan

From: Ali Haghighi <ali.g.haghighi@gmail.com>
Sent: Friday, April 24, 2015 7:53 AM
To: Ryan, Joan
Subject: Step by Step Montessori Application

Hello Joan,

I hope you are well. I submitted the required number of copies of the new plan yesterday.

The proposed application is for child care center with 24 children capacity.

This center requires 3 employees and so only 3 parking spots.
24 children requires 4 parking spot including one disabled.
1 spot for load/unload was required.

We have provided 8 spots in our plan now.

I spoke with Ray and explained that director has her own parking spot next door and she has no distance with the proposed center.

This explanation is provided in case of any possible confusions in any departments.

I wish you the best day.

Ali

PROJECT
STEP BY STEP
MONTESSORI SCHOOL INC.
4991 CLAYTON ROAD
CONCORD, CA 94521

DRAWINGS INDEX

SHEET	TITLE
A	EXISTING AND NEW SITE PLAN AND PROJECT DATA
A1	NEW SITE PLAN AND ADJACENT LOTS

PARKING TABULATION

- 24 CHILDREN — 4 PARKING SPACES

CHILD TO ADULT RATIO

(4) INFANTS — (1) TEACHER
(6) TODDLERS — (1) TEACHER

WALL LEGEND

LEGEND

PROJECT DATA

- A.P.N. # 116293004
- CONST TYPE V-N
- LOT SIZE 0.183838 ACRES 8,009 S.F.
- EXISTING BUILDING 1,222 S.F.
- OCCUPANCY GROUP I-4
- ZONING CO
- FAR BLDG. 15%
- FAR LANDSCAPE AND COMMON AREA 85%
- FLOOD ZONE AO-DEPTH 1

PARKING DATA

- STANDARD STALLS 4
- H.C. VAN ACCESS 1
- TOTAL STALLS PROVIDED 5

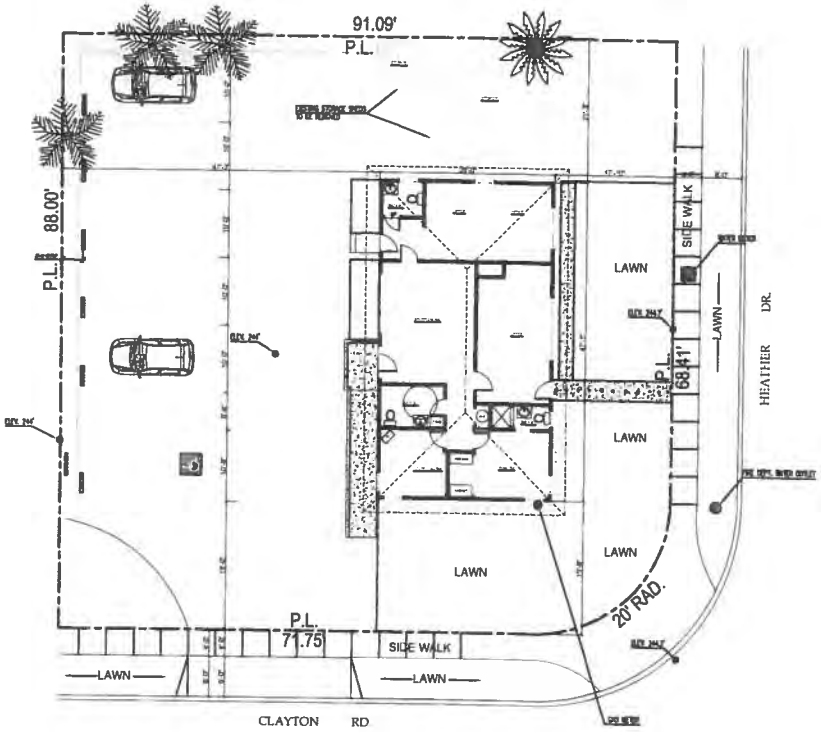
CODES

2013 CALIFORNIA ENERGY CODE
2013 CALIFORNIA ELECTRICAL CODE
2013 CALIFORNIA RESIDENTIAL CODE

SCOPE OF WORK

TO CONVERT EXISTING MEDICAL BUILDING TO A DAY CARE WITH NO MORE THAN 30 OCCUPANCIES, AS A RESULT THE USE STILL REMAINS AS BEFORE AS "B" OCCUPANCY.

VICINITY MAP



EXISTING SITE PLAN
SCALE 1/8" = 1'=0"

RECEIVED
MAY 27 2015
PLANNING

BETTA GROUP

PROJECT:
STEP BY STEP
MONTESSORI SCHOOL INC.
4991 CLAYTON ROAD
CONCORD, CA 94521

SHEET TITLE:
EXSTG SITE PLAN
& PROJECT DATA

JOB NO: 0115-1482
PLOT DATE: 1/28/2015
DRAWN BY: F.M.

No. C051905
Exp. 12-31-16

PROVISIONS

CONDITIONS OF ISSUANCE

A

SCALE: 1/8" = 1'-0"

EXHIBIT C

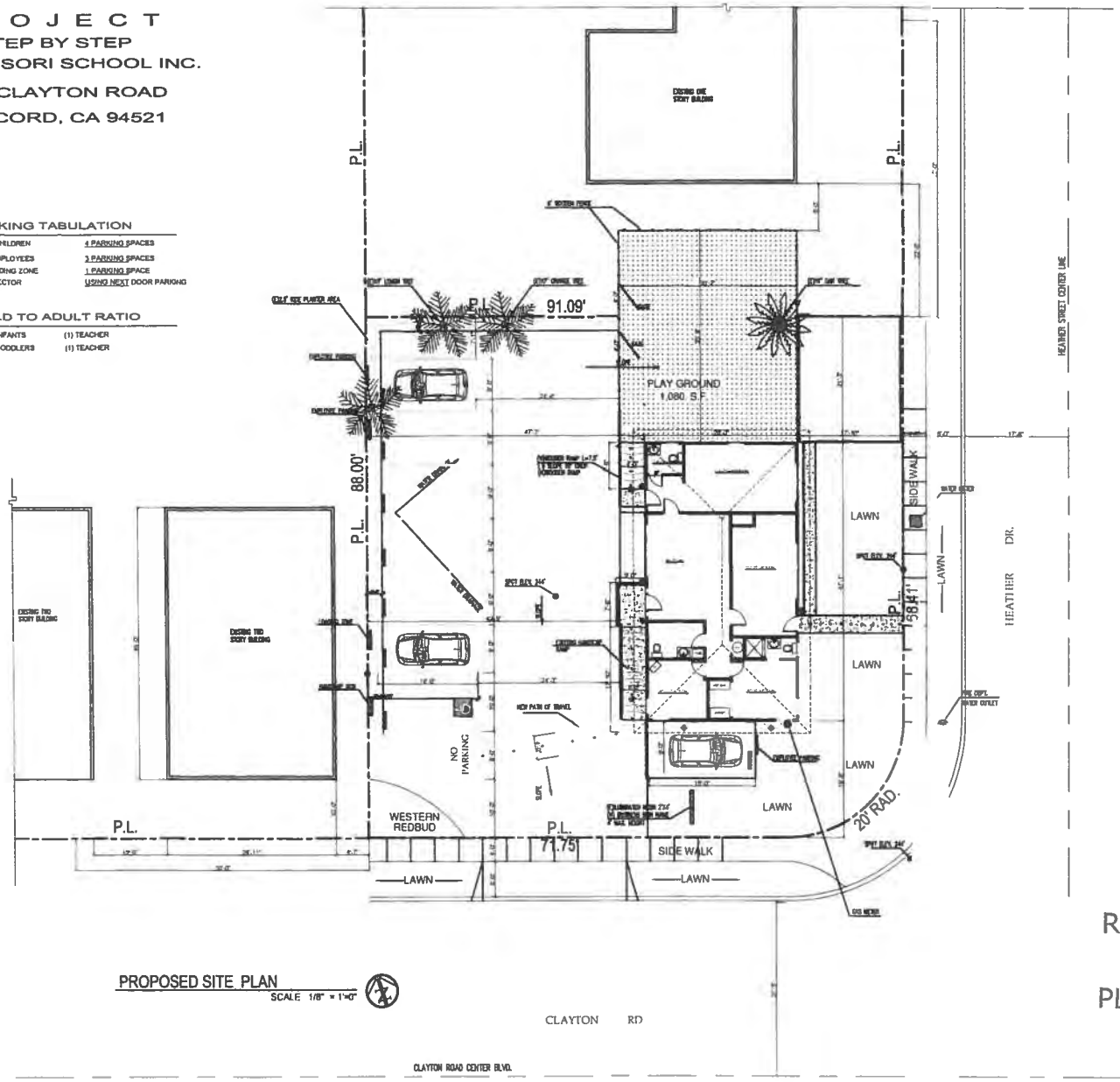
PROJECT
STEP BY STEP
MONTESSORI SCHOOL INC.
4991 CLAYTON ROAD
CONCORD, CA 94521

PARKING TABULATION

24 CHILDREN	4 PARKING SPACES
3 EMPLOYEES	3 PARKING SPACES
LOADING ZONE	1 PARKING SPACE
DIRECTOR	USING NEXT DOOR PARKING

CHILD TO ADULT RATIO

(4) INFANTS	(1) TEACHER
(6) TODDLERS	(1) TEACHER



PROPOSED SITE PLAN
SCALE 1/8" = 1'-0"

RECEIVED
MAY 27 2015
PLANNING

BETTA GROUP

PROJECT:

STEP BY STEP
MONTESSORI SCHOOL INC.
4991 CLAYTON ROAD
CONCORD, CA 94521

SHEET TITLE:

NEW SITE PLAN
& ADJACENT LOTS

JOB NO: 0115-1482
PLOT DATE: 1/28/2015
DRAWN BY: F.M.

REVISIONS

SEAL

No. C051995
Exp 12 31 16

PROVISIONS

CONDITIONS OF ISSUANCE

DRAWING NO.

A1

SCALE 1/8" = 1'-0"

Concord

REPORT TO PLANNING COMMISSION

DATE: June 3, 2015

SUBJECT: COSTCO FUELING FACILITY EXPANSION - PL131129-UA, DR

Recommendation: Adopt Resolution No. 15-04 PC, approving and adopting an Addendum to the 1999 Costco Wholesale Project Environmental Impact Report (EIR 1-99) and approving an application for a Use Permit Amendment and Design Review for the Costco Wholesale Fueling Facility Expansion (PL131129-UA, DR).

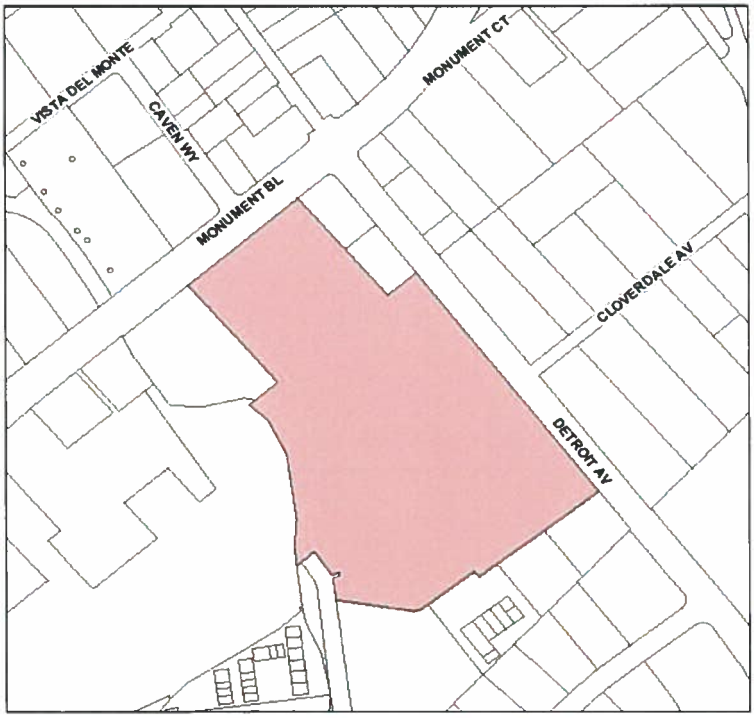
I. Introduction

A. Application Request

Consideration of an Addendum to the 1999 Costco Wholesale Project Environmental Impact Report (EIR 1-99) originally certified for Costco by City Council Resolution No. 99-119, and application for a Use Permit Amendment and Design Review to add three multi-product dispensers (MPD) on the entry side of all four existing fueling islands and related improvements.

B. Location

The project site is located at 2400 Monument Boulevard; APN 129-040-010



C. Applicant
Barghausen Consulting Engineers
18215 72nd Avenue South
Kent, WA 98032

Owners
Costco Wholesale
999 Lake Drive
Issaquah, WA 98027

II. Background

In 1999, the City approved a Rezone (RZ 3-99), Preliminary Development Plan (PDP 5-99), and Use Permit (UP 26-99) application by Costco to construct a bulk retail warehouse, food court, tire center, and three-island fueling facility at 2400 Monument Boulevard (1999 Project). An Environmental Impact Report (EIR 1-99) with Statement of Overriding Considerations and Mitigation Monitoring Program were certified for the project. The 1999 Project was completed soon after entitlement approval.

The following projects were approved and constructed for Costco subsequent to completion of the 1999 Project:

- Addition of a fourth fueling island with three additional fuel pumps in 2001 (UP 01-10).
- A 3,840 square foot receiving dock expansion and 7,840 square foot enclosed garden center addition (ZA 07-03).
- Off-site employee-only parking lot addition with 162 spaces located directly across the warehouse on Detroit Avenue (ZA 11-10)

These projects were Categorically Exempt from CEQA review as small projects or minor additions to the 1999 Project. The 1999 Project and subsequently completed projects are hereafter collectively referred to as the "Approved Project."

On May 14, 2013, Costco filed a Preliminary Application for plans to add a fifth fueling island to their gas station. The application was reviewed on May 28, 2013 by the Development Advisory Committee (DAC), who commented on information requirements and site circulation.

On May 30, 2013, the Design Review Board conducted a conceptual review of the Preliminary Application. The Board recommended design approval with a condition to reconfigure existing drive aisles around the gas station to improve vehicular circulation. The Board deferred its review of this change to staff and the Planning Commission.

Costco filed a formal Use Permit Amendment and Design Review application for the project on July 25, 2013, and proposed various project revisions subsequent to their application submittal. On April 30, 2015, Costco revised its application and project scope to consist of the following improvements: 1) the addition of one multi-product dispenser (MPD) on the entry side of all four existing fueling islands, resulting in eight additional fueling positions, 2) a 36-foot by 120-foot fueling island canopy addition (approximately 4,320 square feet) to provide weather protection for the MPDs, 3) the installation of one, 20,000-gallon diesel product underground storage tank (UST), 4) installation of one, 3,500-gallon gasoline/diesel split additive UST, and associated product piping, and 5) the

removal of five parking stalls for the addition of an 800 square foot water quality bio-retention area (hereafter referred to as "2015 Project"). The application was deemed complete on May 5, 2015.

III. General Information

A. General Plan

The General Plan designation is Regional Commercial.

B. Zoning

The site is zoned RC (Regional Commercial).

C. CEQA Status

Pursuant to CEQA of 1970, as amended, staff prepared an Addendum to the 1999 Environmental Impact Report ("1999 EIR") originally certified and adopted for the Costco Wholesale Development project approved by the City of Concord via City Council Resolution No. 99-119, along with the associated Mitigation and Monitoring Program ("MMP"), a Statement of Findings, and a Statement of Overriding Considerations that potential impacts would be reduced to less-than-significant levels, except for one significant and unavoidable impact on the environment related to regional emissions. The MMP, the Statement of Findings, and the Statement of Overriding Considerations are included within the definition of 1999 EIR.

The Addendum evaluates whether the 2015 Project (i.e., the Use Permit Amendment for the expansion of the fueling facility) proposes changes to the Approved Project which would result in any new or substantially more adverse significant effects or require any new mitigation measures not identified in the 1999 EIR, and concludes that the analysis and the conclusions of the 1999 EIR remain current and valid. No substantial changes have occurred with respect to existing conditions that would cause new or substantially more severe significant environmental effects than were identified in the 1999 EIR. Additionally, no new meaningful information indicates that the 2015 Project would cause new or substantially more severe significant environmental effects that were analyzed in the 1999 EIR.

The Addendum also considers whether any substantial changes have occurred with respect to the circumstances under which the 2015 Project will be undertaken which would require major revisions to the 1999 EIR due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects. While there have been regulatory changes since the 1999 EIR (e.g., requirement for an analysis of greenhouse gas emissions), in all instances, the changes in circumstances do not result in new or substantially more severe significant effects or the need for new mitigation measures. The Addendum further finds that, notwithstanding the changes in circumstances, completion of the expansion would not result in new significant or substantially more severe environmental impacts than those analyzed in the 1999 EIR, all mitigation measures will

remain in place and continue to be enforced, and the Statement of Overriding Considerations will remain in effect.

D. Site Description & Surrounding Land Use

Costco Warehouse is located on a 15.75-acre site with frontage along Monument Boulevard to the north, Detroit Avenue to the east, and a private access road to the south. The site is primarily accessed from Monument Boulevard by a right turn only driveway and from Detroit Avenue via signalized driveway. Two additional driveways off the private roadway provide access to the rear of the property where additional parking and Costco's loading docks and back of house operations are located.

Costco's retail warehouse is located at the south end of the site with the fueling facility on the north end adjacent to Monument Boulevard. Customer parking is located between these two buildings and along the west side of the warehouse. An employee-only parking lot is located across the street on Detroit Avenue. The site is surrounded by the following uses:

Table 1: Surrounding Uses

	Land Use	General Plan Designation	Zoning
North	Harvest House/ Retail	Service Commercial	SC
East	Arco Gas Station	Service Commercial	SC
South	Church of Jesus Christ of Latter Day Saints/ Just Floors	Regional Commercial	PD
West	Self Storage	Regional Commercial	PD

IV. Project Description & Analysis

The 2015 Project proposes the following improvements to the Costco Fueling Facility: 1) the addition of one multi-product dispenser (MPD) on the entry side of all four existing fueling islands, resulting in eight additional fueling positions, 2) a 36-foot by 120-foot fueling island canopy addition (approximately 4,320 square feet) to provide weather protection for the MPDs, 3) the installation of one, 20,000-gallon diesel product underground storage tank (UST), 4) installation of one, 3,500-gallon gasoline/diesel split additive UST, and associated product piping, and 5) the removal of five parking stalls for the addition of an 800 square foot water quality bio-retention area. No changes are proposed to the facility's hours of operation (Weekdays 6:00 a.m. – 9:30 p.m., Saturday 6:00 a.m. – 8:00 p.m., and Sunday 7:00 a.m. – 7:00 p.m.).

A. General Plan & Zoning

General Plan

The 2015 Project is consistent with the Regional Commercial designation for the property under the Concord 2030 General Plan. This designation is intended for large-scale commercial development serving both local and regional residents. A broad range of region-serving retail uses and services are envisioned, including warehouse membership clubs and travel-related

services such as gas stations. Pursuant to finding #5b of the attached resolution, the project is consistent with all applicable policies contained in the Land Use and Growth Management elements of the General Plan.

Zoning

The subject property is zoned RC (Regional Commercial). The project is classified as "Gas Stations" under the Development Code and is a conditionally permitted use in the RC district. The project meets RC zoning standards and all applicable development standards as noted in Table 2 of this report and findings #5a of the attached resolution.

B. CEQA Determination

The 1999 EIR identified mitigation measures to reduce all potentially cumulative impacts related to drainage, traffic/circulation, biological resources, noise, and visual resources, to a less-than-significant level, and resulted in no growth-inducing impacts. The 1999 EIR, however, identified one significant and unavoidable adverse impact to air quality: the Approved Project would contribute to an increase in regional emissions that could not be mitigated to an acceptable level.

The Addendum prepared in May 2015 finds that, notwithstanding the changes in circumstances, completion of the 2015 Project would not result in new significant or substantially more severe environmental impacts than those analyzed in the 1999 EIR, and no additional mitigation measures are required. Existing mitigation measures will remain in place and continue to be enforced. Potential impacts would be reduced to less-than-significant levels with incorporation of the 1999 EIR and Mitigation and Monitoring Matrix. The 2015 Project will comply with all applicable mitigation measures of the 1999 EIR. The Addendum further finds that no substantial changes will occur with respect to Air Quality and the Statement of Overriding Considerations will remain in effect.

C. Development Regulations

The site is zoned RC (Regional Commercial). The existing development complies with RC development standards related to lot dimensions, lot area, building setbacks to property lines, building height, and floor area. The proposed addition would not alter these conditions and the project will continue to conform with RC standards. While on-site parking will be reduced by five spaces (from 944 to 939 parking spaces), the reduced parking still complies with retail parking requirements, as noted in the table and explained further in Section D of this report.

Table 2: Development Standards

Standards	Required	Proposed
Lot Area (minimum)	80,000 s.f.	686,232 s.f.
FAR (max.)	0.5	0.23[1]
Lot width (minimum)	100 ft.	400 ft.
Lot Depth (minimum)	200 ft.	> 1,000 ft.
Setbacks (minimum)		

Standards	Required	Proposed
Front yard	5 ft.	44 ft.
Side yard	None[2]	160 ft.
Exterior Side yard	10 ft.	30 ft.
Rear yard	None[2]	65 ft.
Building Height (max.)	50'	32'
Parking Spaces	1 space/250 s.f. of gross floor area (641 total spaces)	1 space/175 s.f. of gross floor area (939 spaces)[3]

[1]FAR (Floor Area Ratio) is based on enclosed floor area and does not apply to unenclosed structures such as canopies, carports and similar structures.
[2]No setback required unless adjacent to R district or residential use.
[3]Total parking consists of 777 on-site spaces and 162 off-site spaces for employees only.

D. Site Planning/Circulation/Parking

Site Plan/Circulation

The project proposes minimal changes to the existing gas station configuration and circulation. The entry side of the existing gas canopy and fueling islands will be extended approximately 36 feet to accommodate one additional MPD at each fueling island. As discussed above, five parking spaces located adjacent to the Monument Boulevard driveway will be removed for landscaping and bio-retention improvements.

Parking

General Retail uses are required to provide one parking space per 250 square feet of gross floor area. A total of 641 parking spaces are required based on Costco's gross floor area of 160,638 sq. ft.

Costco currently has a total of 944 parking spaces consisting of 782 on-site customer parking spaces, and an off-site employee-only parking lot with 162 spaces directly across the street on Detroit Avenue. The proposed expansion will result in a loss off five on-site parking stalls for the construction of a bio-retention facility, for a proposed total of 939 parking spaces. Even with the loss of five spaces, the proposed total still exceeds the retail parking requirement.
And as further explained in the Addendum,[1] and there is currently a 6 percent reserve capacity for parking during the weekend peak half-hour (or approximately 57 spaces) to accommodate a fluctuation in parking demand.

[1]The December 2009 amendments to the State CEQA Guidelines (which became effective March 18, 2010) removed parking from the State's Environmental Checklist (Appendix G of the State CEQA Guidelines) as an environmental factor to be considered under CEQA. However, the City in its review of the 2015 Project, wants to ensure that the potential loss of parking spaces would result in minimal adverse effects to project occupants and visitors. As such, although not required by CEQA, parking conditions are evaluated in this document and in the Addendum as a non-CEQA topic for informational purposes.

E. Building Architecture/Landscaping

The existing gas canopy is constructed of a standing seam metal mansard roof, metal fascia, and fluted masonry columns. The proposed canopy addition will match the current design. Landscaping that needs to be removed for the construction of new piping and other conduits will be replaced. An approximately 800 square foot bio-retention area will also be constructed in the place of five existing parking spaces located adjacent to the Monument Boulevard driveway. These improvements will result in minimal changes to the look, layout, and circulation of the existing facility, and meet all applicable design criteria as discussed in findings #6a-c in the attached resolution.

F. Use Permit

The required use permit findings are listed below in *italics* followed by a brief explanation of how the project meets each finding.

1. *The proposed use is allowed within the applicable Zoning District and complies with all other applicable provisions of the Development Code and the CMC.*

   Gas Station is a conditionally allowed use under the property's RC (Regional Commercial) zoning. The project includes a Use Permit Amendment as required by the Development Code to expand the existing Gas Station use. The project meets all applicable RC zoning and development standards related to building setback, building height, and parking as explained in this report and Table 2. The project meets all applicable standards for gas stations set forth in Development Code Section 18.200.090, including setbacks requirements for fueling islands and screening of vapor processing units.

2. *The proposed use is consistent with the General Plan and any applicable Specific Plan.*

   The subject property is designated as Regional Commercial by the General Plan. This designation is intended for large-scale commercial development serving both local and regional residents. A broad range of retail uses and personal services are envisioned including "warehouse membership clubs" and "travel-related services such as…gas stations." There is no specific plan that applies to the project site.

3. *The design, location, size, and operating characteristics of the proposed activity are compatible with the existing and future land uses in the vicinity.*

   The project is compatible with existing development because it would merely expand a gas station while maintaining current operational characteristics including business hours, site circulation, and aesthetics. Additionally, the expansion is internal to the site and would not impact any existing or future land uses in the vicinity.

4. *The site is physically suitable for the type, density, and intensity of the proposed use, including access, utilities, and the absence of physical constraints.*

   The project proposes a minor expansion that will not significantly alter the type, density and intensity of the existing fueling facility. The site is adequately served by access and utilities, and does not have any physical constraints.

5. *Granting the permit would not be detrimental to the public health, safety, or welfare of the persons residing or working in the subject neighborhood or materially detrimental or injurious to property or improvements in the vicinity and Zoning District where the property is located.*

   Granting the permit would not be detrimental to the public health, safety, or welfare of persons residing or working in the neighborhood because the project would expand an existing use that is consistent with the General Plan and allowed by zoning. The project is also compatible with commercial uses in the vicinity, including auto-related services and gas stations. Moreover, the proposed improvements are located away from neighboring properties and thus will not be materially injurious to nearby properties or improvements.

V. Fiscal Impact

The proposed would have a negligible fiscal impact on the City.

VI. Public Contact

Notification was mailed to all owners and occupants of property within three-hundred (300) feet of the subject parcel, and has been published in the Contra Costa Times, as required by the Concord Municipal Code. This item has also been posted at the Civic Center and at the subject site at least 10 days prior to the public hearing.

VII. Summary and Recommendations

The changes associated with the project would not trigger any of the conditions described in CEQA Guidelines Section 15162 requiring preparation of a subsequent or supplemental EIR or MND. Thus, the Addendum satisfies the requirements of CEQA Guidelines sections 15162 and 15164. The Project would not introduce new significant environmental effects, substantially increase the severity of previously identified significant environmental effects, or show that mitigation measures previously found not to be feasible would in fact be feasible.

The proposed expansion will result in minimal changes to the existing facility, and will remain compatible with current operational characteristics and surrounding developments. The project is consistent with General Plan policies related to Regional Commercial uses and applicable development standards of the RC (Regional Commercial) zoning. Staff recommends the Planning Commission open the public hearing, consider the staff report and presentation by the applicant, the public testimony, and close the hearing upon completion of public testimony. Staff recommends the

Planning Commission adopt Resolution No. 15-04 PC, approving and adopting an Addendum to the 1999 Costco Wholesale Project Environmental Impact Report (EIR 1-99) and approving an application for a Use Permit Amendment and Design Review for the Costco Wholesale Fueling Facility Expansion (PL131129-UA, DR).

VIII. Motion

Project Approvals

I (Comm. _____) hereby move that the Planning Commission adopt Resolution No. 15-04PC Adopt Resolution No. 15-04 PC, approving and adopting an Addendum to the 1999 Costco Wholesale Project Environmental Impact Report (EIR 1-99) and approving an application for a Use Permit Amendment and Design Review for the Costco Wholesale Fueling Facility Expansion (PL131129-UA, DR). (Seconded by Comm. _____.)

Prepared by: Frank Abejo
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Reviewed by: Laura Simpson
Laura Simpson
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Exhibits:

A - Prior Project Approvals
B - Applicant's Project Narrative
C - Project Plans
D - Resolution 15-04PC, Draft Conditions of Approval (Attachment A), 1999 Costco Wholesale Project Environmental Impact Report (Attachment B) and Addendum (Attachment C)[2]

15srpc.025 Costco Fueling Facility Expansion.docx

[2] The 1999 Costco Wholesale Project Environmental Impact Report (Attachment B), Addendum (Attachment C), and reference documents are available at the City of Concord Permit Center, 1950 Parkside, Concord, CA 94519, Monday through Thursday, 8:00 a.m. – 5:00 p.m., and Friday 8:00 a.m. – 12:00 p.m., and on the City's website at www.cityofconcord.org

EXHIBIT A

ORIGINAL

BEFORE THE CITY COUNCIL OF THE CITY OF CONCORD
COUNTY OF CONTRA COSTA, STATE OF CALIFORNIA

A Resolution Approving the Preliminary Development Plan (PDP 5-99) for the Costco Wholesale Project, Located at the Southwest Corner of Monument Boulevard and Detroit Avenue, Parcel Numbers 129-030-007, 014, 027, 035, and 129-040-004, 007, 008

Resolution No. 99-109

WHEREAS, an application for a Preliminary Development Plan (PDP 5-99), including an approximately 149,000 square foot bulk retail/wholesale facility, a 5,200 square foot tire center, a 1,075 square foot food court, a three-island gas station, and approximately 70,000 square feet of additional commercial/industrial space on a 21.4 acre site for the Costco Wholesale project was filed; and

WHEREAS, after giving all notice required by state and local law, the Planning Commission held public hearings on October 6, 1999 and October 20, 1999 on the Preliminary Development Plan application (PDP 5-99); and

WHEREAS, at the public hearings members of the public were afforded an opportunity to present testimony regarding the applications; and

WHEREAS, the Planning Commission held study sessions on September 29, 1999 and November 10, 1999 to discuss the proposed project and environmental document; and

WHEREAS, upon the close of the public hearings, the Planning Commission considered the testimony and information received at the public hearings and the written reports from City staff; and

WHEREAS, the Planning Commission reviewed and considered the information contained in the Preliminary Final EIR in making its recommendations on the project; and

WHEREAS, the Planning Commission recommended approval of the Preliminary Development Plan on November 17, 1999; and

WHEREAS, after giving all notice required by state and local law, the City Council held a public hearing on November 23, 1999 on the Preliminary Development Plan application (PDP 5-99); and

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WHEREAS, at said public hearing members of the public were afforded an opportunity to present testimony regarding the applications; and

WHEREAS, upon the close of the public hearing the City Council considered the testimony and information received at the public hearing and the written reports from City staff.

NOW, THEREFORE, THE CITY COUNCIL OF THE CITY OF CONCORD DOES RESOLVE AS FOLLOWS:

Section 1. Approves the Rezoning and the Preliminary Development Plan with findings and conditions for the Costco Wholesale project (Attachment A).

Section 2. Finds the Costco Wholesale project to be consistent with the Concord General Plan and Zoning Ordinance.

Section 3. Requires that the approval of the Preliminary Development Plan and any other approvals required for this project be subject to compliance with the adopted environmental mitigation measures and monitoring program.

Section 4. This resolution shall become effective immediately upon its passage and adoption.

PASSED AND ADOPTED by the City Council of the City of Concord on December 14, 1999, by the following vote:

AYES: Councilmembers - B. McManigal, M. Pastrick, M. Peterson, H. Allen

NOES: Councilmembers - L. Hoffmeister

ABSTAIN: Councilmembers - None

ABSENT: Councilmembers - None

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I HEREBY CERTIFY that the foregoing Resolution No. 99-109 was duly and regularly adopted at a regular joint meeting of the City Council and the Redevelopment Agency of the City of Concord on December 14, 1999.

Lynnet Keihl, CMC
City Clerk

By Mardie Traver
Mardie Traver, CMC
Assistant City Clerk

APPROVED AS TO FORM:

Richard Doyle
City Attorney

ORIGINAL

BEFORE THE CITY COUNCIL OF THE CITY OF CONCORD
COUNTY OF CONTRA COSTA, STATE OF CALIFORNIA

A Resolution Certifying the Environmental Impact Report (EIR 1-99) for the Costco Wholesale Project, Finding that the Project will have One Significant Impact on the Environment, Adopting a Statement of Findings and Statement of Overriding Considerations, and Incorporating Mitigation Measures and the Mitigation Monitoring Program as a Condition of Project Approval

Resolution No. 99-119

WHEREAS, an application for a Preliminary Development Plan (PDP 5-99) for the Costco Wholesale project was filed; and

WHEREAS, in accordance with the California Environmental Quality Act (CEQA) and its implementing guidelines, the City determined that an Environmental Impact Report (EIR) would be required and caused an EIR to be prepared for the project; and

WHEREAS, the Draft EIR evaluated the environmental impacts of the proposed Costco Wholesale project in the City of Concord; and

WHEREAS, a Notice of Preparation of a Draft EIR was issued on March 4, 1999 allowing a thirty-day comment and review period in accordance with applicable regulations; and

WHEREAS, a Scoping Meeting was held on March 10, 1999 to allow public input prior to completion of the Draft EIR; and

WHEREAS, the Draft EIR was circulated to the public for comment and review from September 4, 1999 to October 20, 1999, a 47-day review period in accordance with applicable regulations; and

WHEREAS, oral and written comments on the Draft EIR were received from the public during the review period through October 20, 1999; and

WHEREAS, public hearings were held by the Planning Commission after providing all public notices as required by State law and the Concord Municipal Code at which time any and all members of the public were allowed to comment on all environmental and planning documents submitted. The Planning Commission conducted public hearings to receive public testimony with respect to the environmental documentation on October 6, 1999 and October 20, 1999; and

WHEREAS, the Planning Commission held study sessions on August 26, 1998, September 29, 1999, and November 10, 1999 to discuss the proposed project and environmental document; and

WHEREAS, at the conclusion of public testimony on the Draft EIR, the Planning Commission caused to be prepared a Preliminary Final EIR, which consists of the Draft EIR, substantive written and oral comments received during the review period, responses to substantive comments, and the Mitigation Monitoring Program; and

WHEREAS, the Planning Commission, at the conclusion of public testimony, recommended that the City Council certify that the Preliminary Final Environmental Impact Report for the Costco Wholesale project (including the proposed Mitigation and Monitoring Program) considered all the substantive environmental impacts of the proposed Costco Wholesale project, is complete and adequate, and complies with all requirements of CEQA and the CEQA Guidelines; and

WHEREAS, the Planning Commission recommended that the City Council find that the proposed project will have a significant effect on the environment; all but one impact can be reduced to a level less than significant: traffic generated by the project would increase regional emissions above the Bay Area Air Quality Management District's threshold of significance. This impact would remain significant and unavoidable resulting from the use and occupancy of the proposed project; and

WHEREAS, the Planning Commission recommended that the City Council adopt a Statement of Findings; and

WHEREAS, the Planning Commission recommended that the City Council adopt the Environmental Mitigation Measures and Mitigation Monitoring Program to reduce the environmental impacts of the project; and

WHEREAS, the Planning Commission recommended that the City Council adopt a Statement of Overriding Considerations finding that the benefits of the proposed project outweigh the significant unavoidable environmental impact related to regional emissions; and

WHEREAS, public hearings were held by the City Council after providing all public notices as required by State law and the Concord Municipal Code at which time any and all members of the public were allowed to comment on all environmental and planning documents submitted. The City

Council conducted a public hearing to receive public testimony with respect to the environmental documentation on November 23, 1999; and

WHEREAS, at the conclusion of public testimony on the Preliminary Final EIR, the City Council caused to be prepared a Final EIR, which consists of the Draft EIR, substantive written and oral comments received during the review period, responses to substantive comments, and the Mitigation Monitoring Program.

NOW, THEREFORE, THE CITY COUNCIL OF THE CITY OF CONCORD DOES RESOLVE AS FOLLOWS:

Section 1. Finds that the Final EIR (EIR 1-99) considers all substantial environmental impacts of the proposed Costco Wholesale project, is complete and adequate, provides adequate responses to all written and oral comments received in response to the Draft EIR and complies with all requirements of the California Environmental Quality Act (CEQA) and the CEQA Guidelines.

Section 2. Finds that the Final EIR (EIR 1-99) applies to all necessary entitlements for the development of the project which are described therein as Rezoning 3-99 (RZ 3-99) and Preliminary Development Plan (PDP 5-99) and all subsequent entitlements, including, for example, the Use Permit and Design Review Board approval, consistent with CEQA and its implementing Guidelines.

Section 3. Finds that the Final EIR has identified all significant environmental effects of the project and that there are no known potential environmental impacts not addressed therein.

Section 4. Finds that a good faith effort was made to evaluate alternatives in the preparation of the Final EIR and all reasonable alternatives were considered in the CEQA review process and decisions and recommendations on the project.

Section 5. Certifies the Final Environmental Impact Report (FEIR)for the Costco Wholesale project as complete and adequate in that it addresses all environmental effects of the proposed project and complies with the requirements of the CEQA and the CEQA Guidelines.

Section 6. Certifies that the Final EIR for the Costco Wholesale project has been presented to the City Council which has reviewed and considered the information contained in the EIR.

Section 7. Finds that the project will have a significant effect on the environment. All but one identified impact can be reduced to a level of insignificance. The impact that will remain significant

and unavoidable is the regional emissions generated by project traffic.

Section 8. Adopts the attached Statement of Findings, Attachment "A," which is required by Section 15091 of the CEQA Guidelines if the City Council approves a project which would have a significant effect on the environment.

Section 9. Adopts the Environmental Mitigation Measures and related Mitigation Monitoring Program incorporated in Attachment "B" to reduce the environmental impacts of the project.

Section 10. Adopts the attached Statement of Overriding Considerations (Attachment "C") which is required if the City Council approves a project which would have a significant effect on the environment but the benefits of the project outweigh unavoidable adverse environmental effects. In this case the unavoidable adverse impacts are related to regional emissions generated by project traffic.

Section 11. This resolution shall become effective immediately upon its passage and adoption.

PASSED AND ADOPTED by the City Council of the City of Concord on December 14, 1999, by the following vote:

AYES: Councilmembers - L. Hoffmeister, B. McManigal, M. Pastrick, M. Peterson, H. Allen

NOES: Councilmembers - None

ABSTAIN: Councilmembers - None

ABSENT: Councilmembers - None

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I HEREBY CERTIFY that the foregoing Resolution No. 99-119 was duly and regularly adopted at a regular joint meeting of the City Council and the Redevelopment Agency of the City of Concord on December 14, 1999.

Lynnet Keihl, CMC
City Clerk

By Mardie Traver
Mardie Traver, CMC
Assistant City Clerk

APPROVED AS TO FORM:

Richard Doyle
City Attorney

CEQA Statement of Findings
Costco Wholesale Environmental Impact Report

The California Environmental Quality Act (CEQA) and the State CEQA Guidelines promulgated pursuant thereto provide:

"No public Agency shall approve or carry out a project for which an EIR has been certified which identifies one or more significant environmental effects of the project unless the public agency makes one or more written findings for each of those significant effects, accompanied by a brief explanation of the rationale for each finding. The possible findings are:

1. Changes or alterations have been required in, or incorporated into the project which avoid or substantially lessen the significant environmental effect as identified in the Final EIR.

2. Such changes or alterations are within the responsibility and jurisdiction of another public agency and not the agency making the finding. Such changes have been adopted by such other agency or can and should be adopted by another agency.

3. Specific economic, legal, social, technological, or other considerations, including provision of employment for highly trained workers, make infeasible the mitigation measures or project alternatives identified in the Final EIR. [Guidelines §15091(a)]

The following are the City of Concord's finding and brief explanations of rationale for each of the significant environmental effects identified in the Costco Wholesale Development EIR. All of the findings below relate to possible finding #1 above, except the finding related to Impact 4.2-3, which relates to possible finding #1 and #2.

1. IMPACT 4.1-1: The Costco building would be out of scale with the adjoining properties and with many of the buildings in the project vicinity.

FINDING: This impact has been reduced to less than significant levels through project revisions as set forth in Mitigation Measures 4.1-1A and 4.1-1B below. The addition of trellises, increased landscaping, and greater architectural detail along the most visible elevations of buildings will reduce the apparent scale of the proposed building. These measures have been incorporated into the plan by the project sponsor.

> **Mitigation 4.1-1A:** The project sponsor shall revise project plans to include additional trellises along the eastern wall to the left and right of the middle section where two trellises are currently proposed.
>
> **Mitigation 4.1-1B:** The project sponsor shall incorporate additional architectural treatment or landscaping on the southern and western elevations where large expanses of blank wall are visible. This can include the use of trellises, the planting of additional trees next to the building, or scoring the concrete and painting the wall with a darker tone.

2. IMPACT 4.1-2: The parking lot lights and service station canopy lights will create glare impacts for the residents in the Sierra Gardens condominiums who overlook the site.

FINDING: This impact has been reduced to less than significant levels through project revisions relocating the gas station away from Sierra Gardens. The reduction in the height of parking lot standards and the reduction in wattage of bulbs to 400 watts will reduce project generated glare on the adjacent Sierra Gardens condominiums as set forth in mitigation measures 4.1-2 below.

> **Mitigation 4.1-2:** The project sponsor shall reduce the wattage of the parking lot lights as well as install shorter light standards that do not exceed 30 feet. Two, 400-watt bulbs could be used on 30-foot-tall light poles.

3. IMPACT 4.1-3: Construction-related impacts would occur without implementation of mitigation measures.

FINDING: This impact will be reduced to less than significant levels through project revisions as set forth in mitigation measures 4.1-3A and B, below, by requiring the implementation of these measures as a conditions of project approval. These construction period operational requirements are required to be included in the contract of the general contractor for the project. Implementation of these measures have proved effective in reducing fugitive dust from construction sites and in reducing construction related noise to acceptable levels. Construction-related noise impacts will be reduced to less than significant levels through implementation of the Mitigation 4.1-3C below by requiring the preparation of a noise attenuation plan as a condition of project approval. The required measures of the attenuation plan have been proven over time to be effective in reducing construction period noise levels.

> **Mitigation 4.1-3A:** The project sponsor shall ensure that the following measures are included in construction contracts to control fugitive dust emissions during demolition of existing structures:
>
> - Water site during demolition of structures and break-up of pavement to control dust generation.
> - Cover all trucks hauling demolition debris from the site.
>
> **Mitigation 4.1-3B**: The project sponsor shall ensure that the following measures are included in construction contracts to control fugitive dust emissions during grading and site preparation activities:
>
> - Water all active construction areas at least twice daily and when necessary. Active areas adjacent to existing land uses shall be kept damp at all times, or shall be treated with non-toxic stabilizers or dust palliatives.
> - Cover all trucks hauling soil, sand, and other loose materials or require all trucks to maintain at least two feet of freeboard.
> - Pave, apply water three times daily, or apply (non-toxic) soil stabilizers on all unpaved access roads, parking areas and staging areas at construction sites.

- Sweep daily (preferably with water sweepers) all paved access roads, parking areas and staging areas at construction sites.
- Sweep streets daily (preferably with water sweepers) if visible soil material is carried onto adjacent public streets.
- Hydroseed or apply non-toxic soil stabilizers to inactive construction areas.
- Enclose, cover, water twice daily or apply non-toxic soil binders to exposed stockpiles (dirt, sand, etc.).
- Limit traffic speeds on unpaved roads to 15 mph.
- Install tire grates at the site exits to avoid tracking mud from the site onto City streets.
- Install sandbags or other erosion control measures to prevent silt runoff to public roadways.

Mitigation 4.1-3C: The project sponsor shall prepare and implement a noise attenuation plan that will include the following measures:

- Limit noise producing construction activity between the hours of 7:00 a.m. and 6:00 p.m. with no construction activity on Sundays or holidays without prior written approval by the Chief of Planning.
- Maintain and muffle all construction equipment powered by internal combustion engines.
- Identify construction equipment staging areas that are 200 feet from residential units.

4. IMPACT 4.2-1: If storm water runoff from portions of the project site are routed into either of the existing City drain lines along the site's east and west boundaries, the resulting peak flow rates could exceed available capacities, resulting in localized flooding along upstream portions of these drainage systems.

FINDING. The project has been revised to avoid this impact. Since the publication of the Draft EIR, the project drainage plan has been refined such that most of the project site will drain directly into Pine Creek. A small portion of the site will drain into the storm drain system on Monument Boulevard. Implementation of Mitigation 4.2-1 below as a condition of project approval will provide the City with documentation that the modest amount of runoff that will drain into the storm drain system on Monument Boulevard is adequate.

Mitigation 4.2-1: The project sponsor shall prepare a drainage plan and calculations demonstrating that there shall be no increase in either the rate or total volume of runoff from the project site into the existing storm drain systems along the site's east and west boundaries unless it can be demonstrated that sufficient capacity exists to accommodate the increased runoff. This can be accomplished with either previously prepared drainage studies or by a new study prepared by the project sponsor, in accordance with City design criteria.

5. IMPACT 4.2-2: Development of the proposed project would prevent future construction of a new drainage outlet to Pine Creek for the Cloverdale Avenue area, as described in the City's Master Drainage Plan.

FINDING. The project has been revised and refined to eliminate this impact. The project drainage system will provide for a connection to the existing storm drain system in Cloverdale Avenue. The project sponsor will grant an easement to the City for all required access rights across the project site as required by Mitigation 4.2-2 below to allow connection to Pine Creek as envisioned in the City's Master Drainage Plan.

> **Mitigation 4.2-2:** The project's central drainage system shall extend to Detroit Avenue, in the vicinity of Cloverdale Avenue. It shall have sufficient capacity to accommodate the runoff from the Cloverdale Avenue neighborhood, as defined by the City Engineering and Transportation Department, and it shall be routed through a drainage easement that grants the City all required access rights.

6. IMPACT 4.2-3: If the project's central drainage system cannot be connected to the existing 36-inch diameter culvert stub in the Pine Creek channel, a new connection will have to be installed, which could potentially compromise the integrity of the existing Pine Creek concrete channel.

FINDING. This impact will be reduced to a less than significant level through implementation of Mitigation 4.2-3, below, which is a condition of project approval. The drainage system connection to the Pine Creek channel will be subject to approval by Contra Costa Flood Control District.

> **Mitigation 4.2-3:** The pipe connection into the Pine Creek channel and all associated modifications of the existing channel walls shall be constructed in accordance with design requirements set forth by the Flood Control District.

7. IMPACT 4.2-4: Soil erosion would be expected to increase during project construction.

FINDING. This impact will be reduced to a less than significant level through implementation of Mitigation 4.2-4 below as a condition of project approval. The implementation of a Storm Water Pollution Prevention Plan has proven to be an effective tool for controlling construction period erosion from development projects throughout the state.

> **Mitigation 4.2-4:** The project sponsor shall prepare a Storm Water Pollution Prevention Plan to control erosion on the project site during construction.

8. IMPACT 4.2-5: The quality of storm water runoff from the developed project site would be expected to decline, resulting from an increase in the production of non-point source urban pollutants.

FINDING. This impact will be reduced to less than significant levels through the implementation of Mitigations 4.2-5A and 4.2-5B, below, which are conditions of project approval. The project sponsor has agreed to include an oil/water separator at the gasoline facility storm drain inlets and fossil filters for the other inlets. The requirement for a long term maintenance plan will ensure that these devises are effective over the long term. The project sponsor has also committed to sweeping of the parking lot twice weekly at a minimum. These measures have proven to be effective in the reduction of adverse impacts to the quality of storm water runoff from nonpoint source urban pollutants.

> **Mitigation 4.2-5A:** The project sponsor shall prepare a plan for regular maintenance and long-term implementation of its Clean Water Program responsibilities, for approval and monitoring by the City Engineering and Transportation Department.
>
> **Mitigation 4.2-5B:** The drainage system and site plan shall be configured to provide infiltration areas throughout the project to capture the "first flush" of storm water runoff, in accordance with the recommendations set forth in the Bay Area Storm Water Management Agencies Association "Start at the Source" design guidance manual.

9. IMPACT 4.3-1: Construction activities such as demolition, excavation and grading operations, construction vehicle traffic and wind blowing over exposed earth would generate exhaust emissions and fugitive particulate matter emissions that would affect local air quality.

FINDING. These impacts will be reduced to less than significant levels through implementation of Mitigations 4.3-1A and 4.3-1B, below, as conditions of project approval. The measures described below have proven to be effective in the reduction of construction period impacts to air quality in past development projects in Concord and throughout the State.

> **Mitigation 4.3-1A:** The project sponsor shall ensure that the following measures are included in construction contracts to control fugitive dust emissions during demolition of existing structures:
>
> - Water affected areas during demolition of structures and break-up of pavement to control dust generation.
> - Cover all trucks hauling demolition debris from the site.
>
> **Mitigation 4.3-1B**: The project sponsor shall ensure that the following measures are included in construction contracts to control fugitive dust emissions during grading and site preparation activities:
>
> - Water all active construction areas at least twice daily and when necessary. Active areas adjacent to sensitive receptors shall be kept damp at all times, or shall be treated with non-toxic stabilizers or dust palliatives.

- Cover all trucks hauling soil, sand, and other loose materials or require all trucks to maintain at least two feet of freeboard.
- Pave, apply water three times daily, or apply (non-toxic) soil stabilizers on all unpaved access roads, parking areas and staging areas at construction sites.
- Sweep daily (preferably with water sweepers) all paved access road, parking areas and staging areas at construction sites.
- Sweep streets daily (preferably with water sweepers) if visible soil material is carried onto adjacent public streets.
- Hydroseed or apply non-toxic soil stabilizers to inactive construction areas.
- Enclose, cover, water twice daily or apply non-toxic soil binders to exposed stockpiles (dirt, sand, etc.).
- Limit traffic speeds on unpaved roads to 15 mph.
- Install tire grates at the site exits to avoid tracking mud from the site onto City streets.
- Install sandbags or other erosion control measures to prevent silt runoff to public roadways.

10. IMPACT 4.3-3: New traffic generated by the project would increase regional emissions. This impact cannot be fully mitigated and is, therefore, significant and unavoidable.

FINDING. This impact will be reduced through implementation of mitigation measure 4.3-3 below which has been included as condition of project approval. However, implementation of this mitigation measure would not reduce the impacts of the project on regional emissions to a less than significant level.

Mitigation 4.3-3: The applicant shall develop, in consultation with the City of Concord Planning Division staff, a Transportation Demand Management plan to reduce single occupant vehicle commute trips by employees of the Costco store and future development within the residual parcel. Prior to issuance of an occupancy permit, the plan shall be submitted for review and approval by the Planning Division. The plan should include the following:

- Designation of an on-site TDM Coordinator
- Provisions to encourage bicycle commutes
- Provision of transit use incentives, and provision of information such as printed schedules and commuter promotions.

11. IMPACT 4.4-1: Project-generated traffic would cause the level of service at the intersection of Detroit Avenue and Whitman Road to deteriorate to LOS F during the Saturday peak period.

FINDING. This impact will be reduced to a less than significant level through implementation of Mitigation 4.4-1 below which has been included as a condition of project approval. Detailed analysis of the effects of such a mitigation on the operation of the intersection of Detroit Avenue and Whitman Road was completed as a part of the EIR traffic study. The study found that such a mitigation would be effective in reducing the identified impact to a less than significant level.

> **Mitigation 4.4-1:** The project sponsor shall install signals at the Detroit Avenue/Whitman Road intersection since the signal would not be needed without the project.

12. IMPACT 4.4-2: Project-generated traffic would result in left-turn queuing at the westbound approach to the intersection of Monument Boulevard and Detroit Avenue that would exceed left-turn capacity.

FINDING. This impact will be reduced to a less than significant level through implementation of Mitigation 4.4-2 below which has been included as a condition of project approval. Detailed analysis of the effects of such a mitigation on the operation of the intersection at Monument Boulevard and Detroit Avenue was completed as a part of the EIR traffic study. The study found that such a mitigation would be effective in reducing the identified impact to a less than significant level.

> **Mitigation 4.4-2:** The project sponsor shall extend the existing left-turn lane at the westbound approach to the intersection of Monument Boulevard and Detroit Avenue to 250 feet, provide an additional left-turn lane of the same length, and adjust the signal timing to eight-phase to provide protected left-turn phases.

13. IMPACT 4.4-3: On-site queuing at the main site entrance during worst-case conditions (PM Peak) would result in unacceptable delays and congestion in internal circulation.

FINDING. This impact will be reduced to a less than significant level through implementation of Mitigation 4.4-3A below which has been included as a condition of project approval. Detailed analysis of the effects of such a mitigation on the operation of the internal circulation of the project was completed as a part of the EIR traffic study. The study found that such a mitigation would be effective in reducing the identified impact to a less than significant level. The implementation of Mitigation 4.4-3A would result in the loss of on-street parking on Detroit Avenue. Implementation of Mitigation 4.4-3B below which has been included as a condition of project approval would replace these lost parking spaces on the site.

> **Mitigation 4.4-3A:** The project sponsor shall install a traffic signal at the main entrance to the project site.

> **Mitigation 4.4-3B:** The project sponsor shall be required to provide parking on site to the impacted businesses equal to the number of parallel parking stalls eliminated on Detroit Avenue.

14. IMPACT 4.4-4: Level of service at the intersection of Detroit Avenue and Whitman Road will deteriorate to LOS F during the Saturday peak period.

FINDING. This impact will be reduced to a less than significant level through implementation of Mitigation 4.4-4 below which has been included as a condition of project approval. Detailed analysis of the effects of such a mitigation on the operation of the intersection of Detroit Avenue and Whitman Drive was completed as a part of the EIR traffic study. The study found that such a mitigation would be effective in reducing the identified impact to a less than significant level.

> **Mitigation 4.4-4:** The project sponsor shall install signals at the Detroit Avenue/Whitman Road intersection since the signal would not be needed without the project.

15. IMPACT 4.4-5: Cumulative future traffic, including project-generated traffic, would result in left-turn queuing at the westbound approach to the intersection of Monument Boulevard and Detroit Avenue that would exceed left-turn lane capacity and degrade the level of service below acceptable levels.

FINDING. This impact will be reduced to a less than significant level through implementation of Mitigation 4.4-5 below which has been included as a condition of project approval. Detailed analysis of the effects of such a mitigation on the operation of the intersection of Monument Boulevard and Detroit Avenue was completed as a part of the EIR traffic study. The study found that such a mitigation would be effective in reducing the identified impact to a less than significant level.

> **Mitigation 4.4-5:** The project sponsor shall extend the existing left-turn lane at the westbound approach to the intersection of Monument Boulevard and Detroit Avenue to 250 feet, provide an additional left-turn lane of the same length, and adjust the signal timing to eight-phase.

16. IMPACT 4.5-2: Water quality in Pine Creek could be adversely affected by construction activities.

FINDING This impact will be reduced to a less than significant level through implementation of Mitigation 4.5-2 below as a condition of project approval. The implementation of Storm Water Pollution Prevention Plan and the measures required by Mitigations 4.5-2B, 4.5-2C have proven to be effective tools for controlling the flow of sediment-laden runoff and other pollutants into down-stream storm drainage systems in development projects throughout the state. The implementation of Mitigation 4.5-2D, which is a condition of project approval, would serve to further minimize the potential impacts of such impacts to Pine Creek by reducing the area of disturbance and by using the natural drainage pattern of the site to direct any sediment and/or pollutants away from the creek.

Mitigation 4.5-2A: Prior to the initiation of any grading or land clearing in areas that could drain to Pine Creek, the project sponsor shall prepare and implement a Storm Water Pollution Prevention Plan (SWPPP). This plan shall be consistent with the applicable requirements of Contra Costa County's non-point source NPDES program. The plan should prevent the movement of sediment from the upland areas subject to construction into the off-site Pine Creek.

Mitigation 4.5-2B: Any topsoil to be stockpiled shall be located in areas on the site where runoff to Pine Creek will not occur.

Mitigation 4.5-2C: Equipment storage and staging areas shall be located in disturbed areas or areas within the development envelope where runoff to Pine Creek will not occur.

Mitigation 4.5-2D: Fueling and maintenance of equipment shall be conducted in the northeast corner of the project site or along the Detroit Avenue corridor to prevent any leakage or runoff into Pine Creek.

17. IMPACT 4.5-4: Development of the project site could result in the loss of potential breeding habitat for migratory birds and potential roosting habitat for special-status bat species due to removal of 53 trees and demolition of existing buildings.

FINDING. Implementation of Mitigation 4.5-4 below which is a condition of project approval will reduce this impact to less than significant levels. While none of the species of concern have been observed on the site, they do occur in the region and could use the existing structures and/or trees on the site for roosting. The proposed survey and recommendations for conditions related to buffering of roosting location and construction scheduling, and required consultation with the Department of Fish and Game would ensure that the identified species would be protected if they should be found to be roosting on the site prior to project demolition, grading, or construction activities.

Mitigation 4.5-4: A biological survey shall be conducted of all on-site trees and buildings that may contain roosting sites. The survey should begin no more than 30 days prior to construction. This survey will determine if nests of protected bird and special-status bat species' roosting sites are present on site. If active nests or roosts are present, recommendations on construction buffers, scheduled removal of the trees and/or buildings shall be developed and any other protective measures will be made. These measures would require the approval of California Department of Fish and Game. Once the measures have been approved by the California Department of Fish and Game, they will be implemented by the project sponsor.

18. IMPACT 4.5-5: Runoff from the gas station and the parking lot could pollute Pine Creek.

FINDING. The project has been revised and refined to include the oil/grease separators required in Mitigation 4.5-A below. Implementation of Mitigation 4.5-5B which is a condition of project approval would reduce the risk of surface runoff into Pine Creek. Implementation of such plans is an effective method of addressing potential spills of gasoline at similar uses throughout the country.

> **Mitigation 4.5-5A:** The project sponsor shall install oil/grease separators in the storm drain system for the parking lot and developed area to prevent the runoff of oil and grease into Pine Creek.
>
> **Mitigation 4.5-5B:** The project sponsor shall prepare and implement a containment plan for the gas station site that will result in the prevention of runoff of any gas or gas station pollutants into Pine Creek.

19. IMPACT 4.7-2: The majority of non-transportation (stationary) noise sources generated by the proposed project would be compatible with surrounding land uses including noise-sensitive receptors (multi-family apartments) to the southwest. However, noise levels generated by parking lot maintenance activities could exceed established noise standards.

FINDING. Implementation of Mitigation Measure 4.7-2 below which is a condition of project approval will reduce this impact to less than significant levels. The restriction of this noisy activity to daytime hours would reduce potential noise conflicts with residents of Sierra Gardens condominiums located approximately 200 feet from some area of the project parking lot.

> **Mitigation 4.7-2:** The use of leaf blowers shall be restricted to the hours of 7:00 a.m. to 6:00 p.m., Monday through Saturday.

20. IMPACT 4.7-3: Noise levels associated with development of the residual property could exceed City standards.

FINDING.. Implementation of Mitigation Measure 4.7-3 below, which is a condition of project approval, will reduce this impact to a less than significant level. While it is unknown what uses and facilities will be proposed to be located on the residual parcel, the requirement to prepare a noise study when specific future development proposals are made for that portion of the site will ensure that potential noise impacts are kept with City noise standards for compatibility with residential uses.

> **Mitigation 4.7-3:** A noise study shall be conducted for the residual property to determine potential noise impacts associated with the future development of buildings and necessary mitigation measures to reduce noise levels below City standards.

21. IMPACT 4.7-5: Construction of the proposed project will temporarily increase noise levels at noise-sensitive receptors.

FINDING: Construction-related noise impacts will be reduced to less than significant levels through implementation of the Mitigation 4.7-5 below by requiring the preparation of a noise attenuation plan as part of project approval. The required measures of the plan have been proven over time to be effective in reducing construction period noise levels at other development sites in Concord.

> **Mitigation 4.7-5:** The project sponsor shall prepare a noise attenuation plan that will include the following restrictions:
>
> - Limit construction activity to daytime hours (7:00 a.m. to 6:00 p.m.) with no construction activity on Sundays or holidays without prior written approval by the Chief of Planning.
> - Maintain and muffle all construction equipment powered by internal combustion engines.
> - Identify construction equipment staging areas that are 200 feet from residential units.

22. IMPACT 4.8-1: The Costco building will dominate the west side of the Detroit Avenue streetscape between Monument Boulevard and Shary Circle.

FINDING. This impact has been reduced to less than significant levels through project revisions including those found in Mitigations 4.8-1A and 4.8-1B below and through other modification to project architectural design including additional landscaping, more definition of proposed façade variations, more contrast in masonry colors, and other architectural details.

> **Mitigation 4.8-1A:** The project sponsor shall revise project plans to include additional trellises along the eastern wall to the left and right of the middle section where two trellises are currently proposed.
>
> **Mitigation 4.8-1B:** The project sponsor shall incorporate additional architectural treatment or landscaping on the southern and western elevations where large expanses of blank wall are visible. This can include the use of trellises, the planting of additional trees next to the building, or scoring the concrete and painting the wall with a darker tone.

23. IMPACT 4.8-3: The gas station and the glare of its lights will be visible to residents overlooking the project site.

FINDING. This impact has been eliminated through the relocation of the gas station away from Sierra Gardens. The impact of other project lighting has been reduced through revisions in the project as recommended in Mitigation 4.8-3.

> **Mitigation 4.8-3:** The project sponsor shall revise the landscape plan to extend the tree mix around the south/southwest perimeter of the gas station area. The depth of the planting should be similar to that placed between the western property line and the gas station area as shown on the conceptual landscape plan in Figure 2-3.

24. IMPACT 4.8-4: The glare of the parking lot lights will be evident to residents overlooking the project site.

FINDING. This impact has been reduced to less than significant levels by incorporation of Mitigation 4.8-4A, below, into the project. The reduction of light pole height and reduction in proposed bulb wattage will be effective in reducing the impacts of site lighting on the residents of Sierra Gardens. This impact will be further reduced through implementation of the recommendations of Mitigation 4.8-4B below which has been included as a condition of project approval.

> **Mitigation 4.8-4A:** The project sponsor shall reduce the wattage of the parking lot lights as well as install shorter light standards that do not exceed 30 feet. Two, 400-watt bulbs may be used on 30-foot-tall light poles.
>
> **Mitigation 4.8-4B:** The project sponsor shall revise either the landscape plan or the lighting plan to avoid lighting conflicts between the trees and light poles. Either place the lights in the middle of the parking row reserving the ends for landscaping, or place a grouping of trees in the center of the parking row. If the latter alternative is selected, shrubbery should be placed around the base of the light pole.

25. IMPACT 4.9-1: Construction of the proposed Costco facility would involve site grading that could potentially disturb and damage buried historical and/or archaeological artifacts or human remains.

FINDING: This impact will be reduced to less than significant levels through inclusion of mitigations 4.9-1A and 4.9-1B below as conditions of project approval. These provisions will be included in the contracts of construction contractors working on the site. The procedures specified in the mitigation measures are adequate to assure that any historical and/or archaeological artifacts or human remains found on the site can be observed and evaluated such that these resources can be preserved or adequately recorded.

> **Mitigation 4.9-1A:** During all grading and excavation activities, if cultural resources are encountered, all work shall be halted and the Planning Division notified at once.
>
> **Mitigation 4.9-1B:** If human remains are among any artifacts uncovered during site disturbance or excavation, all ground-disturbing work shall cease, and the County Coroner and the City of Concord Chief of Planning and Building Official must be notified immediately. If the coroner determines the remains to be Native American, the Native American Heritage Commission must be contacted within 24 hours. The qualified archaeologist, in consultation with the Native American Heritage Commission, will recommend subsequent measures for disposition of the remains.

MITIGATION MONITORING PLAN
(For Significant Impacts only)

Mitigation Measure	Person/Agency Responsible for Mitigation	Monitoring Requirements	Person/Agency Responsible for Monitoring	Timing or Frequency of Monitoring
LAND USE AND LAND USE COMPATIBILITY				
4.1-1A: The project sponsor shall revise project plans to include additional trellises along the eastern wall to the left and right of the middle section where two trellises are currently proposed.	Project Sponsor	Confirm revision to landscape plan incorporating additional trellises on eastern wall	City Planning Division	Prior to use permit approval
4.1-1B: The project sponsor shall incorporate additional architectural treatment or landscaping on the southern and western elevations where large expanses of blank wall are visible. This can include the use of trellises, the planting of additional trees next to the building, or scoring the concrete and painting the wall with a darker tone.	Project Sponsor	Confirm revision of plans for southern and western elevations incorporating the use of trellises, planting of additional trees, or addition of architectural treatment	City Planning Division	Prior to use permit approval Prior to Design Review Board approval
4.1-2: The project sponsor shall reduce the wattage of the parking lot lights as well as install shorter light standards that do not exceed 30 feet. Two, 400-watt bulbs could be used on 30-foot-tall light poles.	Project Sponsor	Confirm that appropriate reductions in wattage and pole height have been made on lighting plan. Conduct on-site inspection	City Planning Division City Construction Division	Review plan prior to use permit approval Prior to issuance of occupancy permit
4.1-3A: The project sponsor shall ensure that the following measures are included in construction contracts to control fugitive dust emissions during demolition of existing structures: • Water site during demolition of structures and break-up of pavement to control dust generation. • Cover all trucks hauling demolition debris from the site.	Project Sponsor/Contractor	Confirm submittal of dust control plan Conduct site visits to confirm plan implementation	City Current Development Division City Construction Division	Prior to issuance of grading permit Daily inspections during demolition
4.1-3B: The project sponsor shall ensure that the following measures are included in construction contracts to control fugitive dust emissions during grading and site preparation activities:	Project Sponsor/Contractor	Confirm submittal of dust control plan Conduct site visits to confirm plan	City Construction Division City Construction Division	Prior to issuance of grading permit Inspections twice per

ATTACHMENT B

Mitigation Measure	Person/Agency Responsible for Mitigation	Monitoring Requirements	Person/Agency Responsible for Monitoring	Timing or Frequency of Monitoring
• Water all active construction areas at least twice daily and when necessary. Active areas adjacent to existing land uses shall be kept damp at all times, or shall be treated with non-toxic stabilizers or dust palliatives. • Cover all trucks hauling soil, sand, and other loose materials or require all trucks to maintain at least two feet of freeboard. • Pave, apply water three times daily, or apply (non-toxic) soil stabilizers on all unpaved access roads, parking areas and staging areas at construction sites. • Sweep daily (preferably with water sweepers) all paved access road, parking areas and staging areas at construction sites. • Sweep streets daily (preferably with water sweepers) if visible soil material is carried onto adjacent public streets. • Hydroseed or apply non-toxic soil stabilizers to inactive construction areas. • Enclose, cover, water twice daily or apply non-toxic soil binders to exposed stockpiles (dirt, sand, etc.). • Limit traffic speeds on unpaved roads to 15 mph. • Install tire grates at the site exits to avoid tracking mud from the site onto City streets. • Install sandbags or other erosion control measures to prevent silt runoff to public roadways.		implementation		week during grading operation
4.1-3C: The project sponsor shall prepare and implement a noise attenuation plan that will include the following measures: • Limit noise producing construction activity between the hours of 7:00 a.m. and 6:00 p.m. with no construction activity on Sundays or holidays without prior written approval by the Chief of Planning.	Project Sponsor/Contractor	Confirm submittal of noise attenuation plan that addresses: construction hours, use of muffled equipment, and staging of equipment Conduct site inspection to confirm compliance with plan	City Construction Division City Construction Division	Prior to issuance of grading permit Periodically during construction

Mitigation Measure	Person/Agency Responsible for Mitigation	Monitoring Requirements	Person/Agency Responsible for Monitoring	Timing or Frequency of Monitoring
• Maintain and muffle all construction equipment powered by internal combustion engines. • Identify construction equipment staging areas that are 200 feet from residential units.				
DRAINAGE				
4.2-1: The project sponsor shall prepare a drainage plan and calculations demonstrating that there shall be no increase in either the rate or total volume of runoff from the project site into the existing storm drain systems along the site's east and west boundaries unless it can be demonstrated that sufficient capacity exists to accommodate the increased runoff. This can be accomplished with either previously prepared drainage studies or by a new study prepared by the project sponsor, in accordance with City design criteria.	Project Sponsor	Review drainage plan and associated calculations	City Construction Division	Prior to issuance of grading permits
4.2-2: The project's central drainage system shall extend to Detroit Avenue, in the vicinity of Cloverdale Avenue. It shall have sufficient capacity to accommodate the runoff from the Cloverdale Avenue neighborhood, as defined by the City Engineering and Transportation Department, and it shall be routed through a drainage easement that grants the City all required access rights.	Project Sponsor	Confirm preparation of storm drain design	City Construction Division	Prior to issuance of grading permits
4.2-3: The pipe connection into the Pine Creek channel and all associated modifications of the existing channel walls shall be constructed in accordance with design requirements set forth by the Flood Control District.	Project Sponsor	Confirm preparation of design in accordance with all applicable County Flood Control and Water Conservation District design guidelines Perform field check during construction	Flood Control District and City Construction Division City Construction Division	Prior to issuance of grading permit Inspect periodically during construction
4.2-4: The project sponsor shall prepare a Storm Water Pollution Prevention Plan to control erosion on the project site during construction.	Project Sponsor	Confirm preparation of SWPPP and approval by RWQCB City to field check implementation of	RWQCB and City Construction Division City Construction Division	Prior to issuance of grading permit Periodically during

Mitigation Measure	Person/Agency Responsible for Mitigation	Monitoring Requirements	Person/Agency Responsible for Monitoring	Timing or Frequency of Monitoring
		plan		construction
4.2-5A: The project sponsor shall prepare a plan for regular maintenance and long-term implementation of its Clean Water Program responsibilities, for approval and monitoring by the City Engineering and Transportation Department.	Project Sponsor	Confirm preparation of long-term SWPPP maintenance plan Confirm implementation of long-term SWPPP maintenance plan with on-site inspections	City Construction Division City Construction Division	Prior to issuance of grading permit Inspect as needed thereafter
4.2-5B: The drainage system and site plan shall be configured to provide infiltration areas throughout the project to capture the "first flush" of storm water runoff, in accordance with the recommendations set forth in the Bay Area Stormwater Management Agencies Association "Start at the Source" design guidance manual.	Project Sponsor	Confirm location of infiltration areas on site plan Conduct periodic inspections	City Construction Division City Construction Division	Prior to issuance of grading permit Inspect as needed thereafter
AIR QUALITY				
4.3-1A: The project sponsor shall ensure that the following measures are included in construction contracts to control fugitive dust emissions during demolition of existing structures: • Water affected areas during demolition of structures and break-up of pavement to control dust generation. • Cover all trucks hauling demolition debris from the site.	Project Sponsor/Contractor	Confirm submittal of dust control plan Conduct site visits to confirm plan implementation	City Construction Division City Construction Division	Prior to issuance of grading permit Daily inspections during demolition
4.3-1B: The project sponsor shall ensure that the following measures are included in construction contracts to control fugitive dust emissions during grading and site preparation activities: • Water all active construction areas at least twice daily and when necessary. Active areas adjacent to sensitive receptors shall be kept damp at all times, or shall be treated with non-toxic stabilizers or dust	Project Sponsor/Contractor	Confirm submittal of dust control plan Conduct site visits to confirm plan implementation	City Construction Division City Construction Division	Prior to issuance of grading permit Inspections twice per week during grading operation

Mitigation Measure	Person/Agency Responsible for Mitigation	Monitoring Requirements	Person/Agency Responsible for Monitoring	Timing or Frequency of Monitoring
palliatives. • Cover all trucks hauling soil, sand, and other loose materials or require all trucks to maintain at least two feet of freeboard. • Pave, apply water three times daily, or apply (non-toxic) soil stabilizers on all unpaved access roads, parking areas and staging areas at construction sites.				
4.3-1B *(continued)* • Sweep daily (preferably with water sweepers) all paved access road, parking areas and staging areas at construction sites. • Sweep streets daily (preferably with water sweepers) if visible soil material is carried onto adjacent public streets. • Hydroseed or apply non-toxic soil stabilizers to inactive construction areas. • Enclose, cover, water twice daily or apply non-toxic soil binders to exposed stockpiles (dirt, sand, etc.). • Limit traffic speeds on unpaved roads to 15 mph. • Install tire grates at the site exits to avoid tracking mud from the site onto City streets. • Install sandbags or other erosion control				
4.3-3: The applicant shall develop, in consultation with the city of Concord Planning Division staff, a Transportation Demand Management plan to reduce single occupant vehicle commute trips by employees of the Costco store and future development within the residual parcel. Prior to issuance of an occupancy permit, the plan shall be submitted for review and approval by the Planning Division. The plan should include, at	Project Sponsor	Review and approve the TDM Plan	City Planning/Transportation Divisions	Prior to issuance of occupancy permit for the store and gas station.

Mitigation Measure	Person/Agency Responsible for Mitigation	Monitoring Requirements	Person/Agency Responsible for Monitoring	Timing or Frequency of Monitoring
a minimum, the following components: • Designation of an on-site TDM coordinator. • Provisions to encourage bicycle commutes. • Provision of transit use incentives, and provision of information, such as printed schedules and commuter promotions. • Carpool incentives.				
TRANSPORTATION/CIRCULATION				
4.4-1: The project sponsor shall install signals at the Detroit Avenue/Whitman Road intersection since the signal would not be needed without the project.	Project Sponsor	Review and approve the design and installation of traffic signal in accordance with City standards	City Transportation Division	Prior to issuance of occupancy permit for the store and gas station
4.4-2: The project sponsor shall extend the existing left-turn lane at the westbound approach to the intersection of Monument Boulevard and Detroit Avenue to 250 feet, provide an additional left-turn lane of the same length, and adjust the signal timing to eight-phase to provide protected left-turn phases.	Project Sponsor	Review and approve the design for extension of left-turn lane, adding an additional left-turn lane and adjusting the signal timing in accordance with City standards Inspect construction of traffic lane and signal improvements	City Transportation Division City Transportation Division	Prior to issuance of occupancy permit for the store and gas station Prior to issuance of occupancy permit for the store and gas station
4.4-3A: The project sponsor shall install a traffic signal at the main entrance to the project site.	Project Sponsor	Review and approve the design and installation of traffic signal in accordance with City standards	City Transportation Division	Prior to issuance of occupancy permit for the store and gas station
4.4-3B: The project sponsor shall be required to provide parking on site to the impacted businesses equal to the number of parallel parking stalls eliminated on Detroit Avenue.	Project Sponsor	Confirm installation of signage restricting the appropriate number of parking spaces for use by businesses on Detroit Avenue	City Transportation Division	Prior to issuance of occupancy permit for the store and gas station
4.4-4: The project sponsor shall install signals at the Detroit	Project Sponsor	Review and approve the design and	City Transportation Division	Prior to issuance of

Mitigation Measure	Person/Agency Responsible for Mitigation	Monitoring Requirements	Person/Agency Responsible for Monitoring	Timing or Frequency of Monitoring
Avenue/Whitman Road intersection since the signal would not be needed without the project.		installation of the traffic signal in accordance with City standards		occupancy permit for the store and gas station
4.4-5: The project sponsor shall extend the existing left-turn lane at the westbound approach to the intersection of Monument Boulevard and Detroit Avenue to 250 feet, provide an additional left-turn lane of the same length, and adjust the signal timing to eight-phase.	Project Sponsor	Review and approve the design for extension of left-turn lane, adding an additional left-turn lane and adjusting the signal timing in accordance with City standards Inspect construction of traffic lane and inspect signal improvements	City Transportation Division City Transportation Division	Prior to issuance of occupancy permit for the store and gas station Prior to issuance of occupancy permit for the store and gas station
BIOLOGICAL RESOURCES				
4.5-2A: Prior to the initiation of any grading or land clearing in areas that could drain to Pine Creek, the project sponsor shall prepare and implement a Storm Water Pollution Prevention Plan (SWPPP). This plan shall be consistent with the applicable requirements of Contra Costa County's non-point source NPDES program. The plan should prevent the movement of sediment from the upland areas subject to construction into the off-site Pine Creek.	Project Sponsor	Confirm preparation of SWPPP and approval by Regional Water Quality Control Board City to field check implementation of plan	Regional Water Quality Control Board and City Construction Division City Construction Division	Prior to issuance of grading permit Field checks periodically during construction
4.5-2B: Any topsoil to be stockpiled shall be located in areas on the site where runoff to Pine Creek will not occur.	Project Sponsor	Approve suitable stockpile locations Inspect suitable stockpile locations	City Construction Division City Construction Division	Prior to issuance of grading permit Periodic on-site inspections during grading
4.5-2C: Equipment storage and staging areas shall be located in disturbed areas or areas within the development envelope where runoff to Pine Creek will not occur.	Project Sponsor	Approve locations of staging areas Inspect locations of staging areas	City Construction Division City Construction Division	Prior to issuance of grading permit Periodic on-site inspections
4.5-2D: Fueling and maintenance of equipment shall be conducted in the northeast corner of the project site or along the Detroit Avenue corridor to prevent any leakage or runoff	Project Sponsor	Approve location for fueling/ maintenance of equipment	City Construction Division City Construction Division	Prior to issuance of grading permit

Mitigation Measure	Person/Agency Responsible for Mitigation	Monitoring Requirements	Person/Agency Responsible for Monitoring	Timing or Frequency of Monitoring
into Pine Creek.		Inspect location for fueling/ maintenance of equipment		Periodic on-site inspections
4.5-4: A biological survey shall be conducted of all on-site trees and buildings that may contain roosting sites. The survey should begin no more than 30 days prior to construction. This survey will determine if nests of protected bird and special-status bat species' roosting sites are present on site. If active nests or roosts are present, recommendations on construction buffers, scheduled removal of the trees and/or buildings shall be developed and any other protective measures will be made. These measures would require the approval of California Department of Fish and Game. Once the measures have been approved by the California Department of Fish and Game, they will be implemented by the project sponsor.	Project Sponsor	Hire wildlife biologist to be paid by project sponsor Confirm completion of survey by wildlife biologist	City Planning Division California Department of Fish and Game and City Planning Division	60 days prior to start of site preparation activities 30 days prior to start of site preparation activities
4.5-5A: The project sponsor shall install oil/grease separators in the storm drain system for the parking lot and developed area to prevent the runoff of oil and grease into Pine Creek.	Project Sponsor	Confirm location of oil/grease separators on drainage plans Inspect location of oil/grease separators	City Construction Division City Construction Division	Prior to issuance of grading permit During construction
4.5-5B: The project sponsor shall prepare and implement a containment plan for the gas station site that will result in the prevention of runoff of any gas or gas station pollutants into Pine Creek.	Project Sponsor	Inspect plans for gas station runoff containment Field check during construction	City Construction Division City Construction Division	Prior to issuance of building permits During construction
NOISE				
4.7-2: The use of leaf blowers shall be restricted to the hours of 7:00 a.m. to 6:00 p.m., Monday through Saturday.	Project Sponsor	Confirm submittal of a noise attenuation plan identifying hours of parking lot cleanup	City Planning Division	As required
4.7-3: A noise study shall be conducted for the residual property to determine potential noise impacts associated with the future development of buildings and necessary mitigation measures to reduce noise levels below City standards.	Future Project Sponsor	Hire noise consultant to be paid by future project sponsor Confirm preparation of noise study	City Planning Division City Planning Division	Part of environmental review process During environmental review process for development of residual property
4.7-5: The project sponsor shall prepare and implement a	Project Sponsor/Contractor	Confirm submittal of noise attenuation	City Construction Division	Prior to issuance of

Mitigation Measure	Person/Agency Responsible for Mitigation	Monitoring Requirements	Person/Agency Responsible for Monitoring	Timing or Frequency of Monitoring
noise attenuation plan that will include the following measures: • Limit construction activity between the hours of 7:00 a.m. and 6:00 p.m. with no construction activity on Sundays or holidays without prior written approval by the Chief of Planning. • Maintain and muffle all construction equipment powered by internal combustion engines. • Identify construction equipment staging areas that are 200 feet from residential units.		plan that addresses: construction hours, use of properly muffled equipment, and staging of equipment Conduct site inspection to confirm compliance with plan	 City Construction Division	grading permit Periodically during construction
VISUAL QUALITY/AESTHETICS				
4.8-1A: The project sponsor shall revise project plans to include additional trellises along the eastern wall to the left and right of the middle section where two trellises are currently proposed.	Project Sponsor	Confirm revision to landscape plan incorporating additional trellises on eastern wall	City Planning Division	Prior to use permit approval Prior to Design Review Board approval
4.8-1B: The project sponsor shall incorporate additional architectural treatment or landscaping on the southern and western elevations where large expanses of blank wall are visible. This can include the use of trellises, the planting of additional trees next to the building, or scoring the concrete and painting the wall with a darker tone.	Project Sponsor	Confirm revision of plans for southern and western elevations incorporating use of trellises, planting of additional trees, or addition of architectural treatment	City Planning Division	Prior to use permit approval Prior to Design Review Board approval
4.8-3: The project sponsor shall revise the landscape plan to extend the tree mix around the south/southwest perimeter of the gas station area. The depth of the planting should be similar to that placed between the western property line and the gas station area as shown on the conceptual landscape plan in Figure 2-3.	Project Sponsor	Confirm that appropriate revisions have been made to landscape plan	City Planning Division	Prior to use permit approval Prior to Design Review Board approval
4.8-4A: The project sponsor shall reduce the wattage of the parking lot lights as well as install shorter light standards that do not exceed 30 feet. Two, 400-watt bulbs may be used on 30-foot-tall light poles.	Project Sponsor	Confirm that appropriate reductions in wattage and pole height have been made on lighting plan Conduct on-site inspection	City Planning Division City Construction Division	Review plan prior to use permit approval Prior to issuance of occupancy permit

Mitigation Measure	Person/Agency Responsible for Mitigation	Monitoring Requirements	Person/Agency Responsible for Monitoring	Timing or Frequency of Monitoring
4.8-4B: The project sponsor shall revise either the landscape plan or the lighting plan to avoid lighting conflicts between the trees and light poles. Either place the lights in the middle of the parking row reserving the ends for landscaping, or place a grouping of trees in the center of the parking row. If the latter alternative is selected, shrubbery should be placed around the base of the light pole.	Project Sponsor	Confirm that appropriate revisions have been made to either the landscape or lighting plan	City Planning Division	Prior to use permit approval Prior to Design Review Board approval
CULTURAL RESOURCES				
4.9-1A: During all grading and excavation activities, if cultural resources are encountered, all work shall be halted and the Planning Division notified at once.	Contractor	Notify City Planning Division when cultural resources encountered	Contractor/City Planning Division	During grading/ excavation activities
4.9-1B: If human remains are among any artifacts uncovered during site disturbance or excavation, all ground-disturbing work shall cease, and the County Coroner and City of Concord Chief of Planning and Building Official must be notified immediately. If the coroner determines the remains to be Native American, the Native American Heritage Commission must be contacted within 24 hours. The qualified archaeologist, in consultation with the Native American Heritage Commission, will recommend subsequent measures for disposition of the remains.	Contractor and/or Archaeologist	Confirm completion of contact with County Coroner, Native American Heritage commission, and qualified archaeologist	Contractor/City Planning Division	Immediately following notification by project sponsor

ATTACHMENT C

Statement of Overriding Considerations
Costco Wholesale Project Environmental Impact Report (EIR 1-99)

The California Environmental Quality Act (CEQA) requires the City to balance the benefits of a proposed project against its unavoidable environmental impacts in determining whether to approve the project. If the benefits of the project outweigh the unavoidable adverse effect, the adverse effects may be considered acceptable.

In the case of the Costco Wholesale Project, there is one significant unavoidable environmental effect: project generated traffic would result in regional air emissions of reactive organic gases and nitrogen oxide above the Bay Area Air Quality Management District's thresholds for identifying significant impacts. Because the bulk retail nature of the proposed facility requires most customers to drive to the proposed site, there are no mitigation measures available to reduce the identified impact to less than significant levels.

When a Lead Agency approves a project that will result in the occurrence of significant effects that are identified in the EIR but can not be avoided or mitigated to a less than significant level, the agency must state in writing the specific reasons for its actions. The following are the overriding considerations to outweigh the identified impact to regional emissions:

1. The project will provide economic benefit to existing businesses in the Monument Boulevard corridor by increasing their exposure to potential customers driving to Costco.

2. The project will provide a convenient centralized location for residents and merchants who are Costco Wholesale members.

3. The project will contribute to the overall upgrading of the Monument Boulevard corridor that is occurring as a result of considerable private and City investment in the area.

4. The project will improve the appearance of the site through the development of a property that has been vacant and underutilized for many years, and will contribute to the upgrading of the image of Monument Boulevard and Detroit Avenue.

5. The project will result in increased revenue to the City of approximately $800,000 annually through the payment of retail sales tax, property taxes and business license fees. The project will help diversify the City's tax base, and enable the city to better fund unmet needs.

6. The project will bring approximately 69 new jobs to the City of Concord, half of which will be full time jobs.

7. The project will provide an easement across private property for the implementation of a planned trail route identified in the City General Plan.

8. The proposed use implements City General Plan Regional Commercial land use designation of the site.

9. The same significant unavoidable impact to regional emissions identified in the EIR would occur regardless of the project location within the Bay Area. If Costco does not locate in Concord, but rather at alternative locations in other jurisdictions, the same significant impact to regional air quality would occur.

CITY OF CONCORD
PERMIT CENTER
1950 Parkside Drive MS/53
Concord, California 94519-2578

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Concord

CITY COUNCIL
Bill McManigal, Mayor
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Helen M. Allen
Laura M. Hoffmeister
Michael A. Pastrick

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Thomas Wentling, City Treasurer

Edward R. James, City Manager

January 6, 2000

Jackie Frank
Costco Wholesale
999 Lake Drive
Issaquah, WA 98027

Re: **COSTCO WHOLESALE USE PERMIT (UP 26-99)**

Dear Mr. Frank:

At a regular meeting of the City of Concord Planning Commission on January 5, 2000 a public hearing was held on your application for a 149,562 square foot bulk retail/wholesale facility, a 5,200 square foot tire center, a 1,075 square foot food court, a three island gas station, and approximately 70,000 square feet of additional commercial/industrial space proposed on 21.4 acres on the southwest corner of Monument Boulevard and Detroit Avenue, parcels 129-030-007, 014, 027, 035, and 129-040-004, 007, 008.

We are pleased to inform you that the Planning Commission, on a vote of 3-1 (Costa)(Moran absent), approved the project with the following environmental determination, findings and conditions:

Environmental Determination

The City Council certified the Final Environmental Impact Report for the Costco Wholesale project on December 14, 1999.

Findings for Approval

1. An EIR for the Costco Project has been certified by the City Council including a CEQA Statement of Overriding Considerations and a mitigation and monitoring program.

2. The proposed project described in the use permit application and as amended by the conditions of approval below is consistent with the Preliminary Development Plan approved for the site by City Council on December 14, 1999.

3. The establishment, maintenance, or operation of the proposed use will not be detrimental to the health, safety, peace, morals, comfort and general welfare of persons residing or working in the neighborhood of the use. The use will not be detrimental or injurious to property and improvements in the neighborhood or to the general welfare of the City.

Conditions of Approval

1. Project development shall conform to plans dated December 14, 1999 titled "Costco Wholesale, Concord California," as modified by the following conditions of approval. (Concept Site Plan is dated November 22, 1999; Concept Landscape Plan is dated November 9, 1999, Concept Elevations are dated November 17, 1999)

2. As required by conditions of the Preliminary Development Plan approval, the project sponsor shall offer to dedicate a trail easement across the site from Detroit Avenue to the west property line to implement the General Plan designated trail . This easement shall be located in the vicinity of the southerly driveway off of Detroit Avenue between the Costco store and the residual property, subject to Planning Division staff approval. The easement shall be of adequate width to accommodate a ten foot wide trail and shall be separated from automobile traffic. The offer of dedication shall be recorded prior to occupancy of the Costco structure. The trail need not be constructed until similar easements are granted across the adjacent flood control channel, PG&E property, the Bruzzone property to the west, and a crossing of the flood control channel is provided. The location of the easement may be relocated subject to the approval of the Planning Commission.

3. All mitigation measures identified in the Final Environmental Impact Report certified by the City council on December 14, 1999 shall be included as conditions of project approval.

4. The landscape plan shall be revised to include additional trees in the north parking lot at the end of the rows of parking along the entrance drive from Detroit Avenue adjacent to the propose pedestrian walkway. Revisions shall be subject to the approval of the Planning Division.

5. A tree removal plan shall be submitted to the Planning Division and approved by Planning Division staff prior to the removal of any trees along the project boundaries of the north parking area. This plan shall include specific tree preservation measures to ensure construction period and long term survival of those trees to be preserved.

6. The project shall comply with all conditions of the Department of Engineering and Transportation (Exhibit A).

7. The use permit is not effective until the approved rezoning takes effect.

8. The ignition of any trucks entering the site outside of allowed loading/unloading hours shall be turned off to prevent noise from idling.

9. The lighting plan shall be revised to reflect the 30-foot height limit imposed by the conditions of the Preliminary Development Plan approval.

This action of the Planning Commission may be appealed to the City Council within ten (10) calendar days of the date of the Planning Commission action. Forms for this purpose are available in the Planning Division office. Other materials necessary for submittal along with the appeal form include a $58.00 fee and stamped, addressed envelopes for notification to property owners and occupants within 300 ft. of the project site.

Please contact me at 671-3369 if you have any questions regarding the Planning Commission's action.

Very truly yours,

Brian Dolan
Principal Planner

BD/cpd

Attach: Exhibit A – Engineering and Transportation Comments dated December 29, 1999

C: Alex Pascual, Engineering Division
Bob Clarke, Engineering Division
Helen Rock-Burk, Information Systems
Hamid Pouya, Building Division
Bill Lewis, Contra Costa County Fire Protection Dist., 2010 Geary Rd, Pleasant Hill, CA 94523
Rich Lambert, Kabler/Robbins, 185 Front, Suite 207, Danville, CA 94526-3323
Brett Hansen, Mulvany Architects, 11820 Northrup Way, Suite E-300, Bellevue, WA 98005-1926

APPROVAL OF MINUTES

The minutes for the 4/18/01Planning Commission meeting were approved unanimously without amendment.

Deborah Raines, Planning Manager, noted to the Commission and audience that staff had received a request to continue agenda item #2 to the May 16th, 2001 Planning Commission meeting.

PUBLIC HEARINGS

1. **COSTCO GASOLINE STATION EXPANSION USE PERMIT AMENDMENT (UPA 2-01)** - Application to add a fourth fueling island, two additional fuel dispensers, and extend the existing fueling island canopy approximately 22 feet at 2400 Monument Boulevard. The General Plan land use designation is Industrial/Business Park; zoning classification is Planned District (PD); APN 129-030-035. Project Planner: Chuck Gabrysiak at 671-3044.

Chuck Gabrysiak, Senior Planner, summarized the staff report and recommended to the Commission that they approve the Use Permit Amendment application.

Vice Chair Sylls asked staff if the parking requirement would be met if the landscaping were enlarged. Mr. Gabrysiak indicated that Costco has more than enough parking spaces to meet the City's Ordinance.

John Ellingsen, Barghausen Construction Engineers, Inc., 18215 72nd Avenue South, Kent, WA, representing Costco, indicated that a revised landscaping plan was submitted prior to the hearing. He indicated that a landscaped island would be removed, but it would not be recognizable. He also stated that with the expansion there would be no loss in parking for the warehouse. He also passed out to the Commission a picture of the subject site. He stated that part of Costco's philosophy is to be able to purchase gas quickly and at a fair price. He indicated that from this expansion the facility would operate more efficiently. Mr. Ellingsen indicated that the expansion is simply extending the canopy to the east to enable customers to move along more quickly in the gas station area. He indicated that the expanded gas station would have a total of eight dispensers. He indicated that some improvements at the gas station were designed and built anticipating the future expansion for four islands. He further indicated that he concurs with the staff report and recommended to the Commission that they approve the application.

Comm. Bjerke requested clarification regarding the removal of the landscape buffer, extending the canopy, and adding the additional pumps. Mr. Ellingsen went to the map and indicated the areas that would be removed with this expansion. He stated that there would be no loss of parking, but the landscaped island would be removed.

Vice Chair Sylls indicated to the applicant that by shifting the island, traffic congestion results in the drive aisle for cars parked in the area. He stated that he has a safety concern for the flow of traffic in the drive aisle when there will be cars backing up in that area. Mr. Ellingsen indicated that it is a parking lot with a standard two-way drive aisle. He indicated that it would not impose any hazards and it would continue to function as a parking lot drive aisle. He indicated that the drive aisle is the primary access to the gas station. Mr. Ellingsen stated to the Commission that the traffic congestion would be minimal.

Vice Chair Sylls opened the public hearing.

Marcus O'Connell, 2061 Grant St., Concord, expressed concerns for the air quality in Contra Costa County. He indicated that Concord has the worst air quality in the County. He stated that he does not believe that the expansion is a minor addition to the project. He also indicated that there are regional impacts as well with this project. He further asked the Commission to explain why CEQA was not involved in this project.

Mitch Khan, 2490 Monument Blvd. Concord, representing Arco Gas Station, stated concerns for the traffic on Detroit Ave., due to traffic blocking the intersection coming from Costco. He indicated that with this expansion more customers would be coming in and out of Costco, but he indicated that there is only one way out. He suggested to the Commission to put a traffic light on Monument Blvd. and Detroit Avenue in order to minimize the traffic problem in that area.

Vice Chair Sylls noted that Mr. Khan's comments should be referred to the Traffic Division to work out the issue with the traffic congestion in that area.

Comm. Bjerke asked staff to contact Mr. Templeton in the Transportation Division and have him evaluate the concerns of Mr. Khan. Mr. Gabrysiak indicated that he would relay those comments to the Traffic Division.

Comm. Costa asked staff why there was no review required by CEQA. Ms. Raines indicated that CEQA provides exemptions for projects considered to be of minor scale and size. She indicated that this project does fall within that. However, she indicated that the Commission might desire to question the applicant regarding the prior EIR. Ms. Raines indicated that her understanding of this project was that this was anticipated in the future. She indicated that this particular expansion was analyzed, evaluated and included in the prior EIR.

Mr. Ellingsen responded to the comments made about the air quality issue. He indicated that they are within the Bay Area Air Quality Management District. He stated that they had authority to construct the facility. He indicated that they would be required to secure a new authority to construct the expanded island, basically meeting the same equipment requirements, frequent limits and vapor recovery components for the station.

Comm. Bjerke clarified with Ms. Raines the reason why this project is categorically exempt from CEQA is because it is a relatively small project. Ms. Raines responded in the affirmative.

Comm. Costa made a motion that the Commission approve the project with the findings and conditions listed in the staff report for the Costco Amendment UPA 2-01.

Comm. Brumley seconded the motion.

Comm. Costa indicated that the Engineering Department should look into the legal requirements for exiting the Arco Gas Station. He indicated that Arco and Costco both have an issue with traffic congestion and that needs to be addressed.

AYES: Bjerke, Brumley, Costa, Sylls

NOES: None

ABSTENTIONS: None

ABSENT: Cornelius

2. **UNOCAL 76 CONVENIENCE MARKET USE PERMIT AMENDMENT (UPA 43-75)** - Application to establish a convenience market by remodeling existing gasoline station, at 4190 Treat Lane. The General Plan land use designation is Neighborhood/Community Commercial; zoning classification is Planned District (PD); APN: 134-062-023. Project Planner: Chuck Gabrysiak @ 671-3044.

Chuck Gabrysiak, Senior Planner, recommended to the Commission that they continue this item to the May 16th, 2001 Planning Commission meeting, based upon the applicant's request.

Vice Chair Sylls opened the public hearing.

Bob Braumhoefner, 1227 Shakespeare Dr., Concord, stated that he has lived in the neighborhood for about 45 years. He stated that this is a quiet family neighborhood, and indicated to the Commission that this type of project would create more trash, cars and beer cans all over the neighborhood. He indicated to the Commission that the place adjacent from the Union 76 Station has been vacant for years because it was also rejected for this type of project. He recommended to the Commission to deny the Unocal 76 convenience market permit.

Comm. Costa asked staff to put the current hours of operation in the staff report that they will receive in two weeks. Mr. Gabrysiak responded that at the study session the project applicant indicated that their corporate hours are to close at midnight and open at 6:00 a.m.

ZA ORDER NO. 07-016

OFFICE OF THE ZONING ADMINISTRATOR
CITY OF CONCORD
APPROVING ZONING ADMINISTRATOR PERMIT (ZA 07-003) AND DESIGN REVIEW (DR 07-012)
Applicant: David Babcock and Associates
Owner: Costco Wholesale
Project Name: Costco Wholesale Warehouse Expansion

WHEREAS, on July 19, 2007, David Babcock and Associates submitted an application for a Zoning Administrator Permit and Design Review for a 3,840 sq. ft. receiving dock expansion and 7,840 sq. ft. enclosed garden center addition to the existing Costco Wholesale warehouse located at 2400 Monument Boulevard, APN: 129-040-010; and

WHEREAS, on August 27, 2007 the application was deemed complete for processing; and

WHEREAS, the application was duly noticed pursuant to the Concord Municipal Code; and

WHEREAS, the subject proposal is consistent with the General Plan; and

WHEREAS, pursuant to the provisions of the California Environmental Quality Act (CEQA) of 1970, as amended; the project is classified as Categorically Exempt pursuant to Section 15301 Class I "Existing Facilities," and therefore no further environmental review is required.

NOW, THEREFORE, BE IT RESOLVED that the Zoning Administrator does hereby approve Zoning Administrator Permit (ZA 07-003) and Design Review (DR 07-012) subject to the attached Conditions of Approval referenced in Attachment A, based on the following findings:

1. The subject proposal is consistent with the City of Concord General Plan, which designates the site as Regional Commercial.

2. The subject proposal is Categorically Exempt from the requirements of CEQA pursuant to Class I "Existing Facilities."

3. The subject proposal will not adversely affect the surrounding properties, which are either zoned for or developed with similar uses.

4. The proposed project meets all the provisions of the City's Zoning Code relating to uses.

Based on the above findings, the Zoning Administrator approved said application subject to

the attached Conditions of Approval, referenced as Attachment A.

G. Ryan Lenhardt
Zoning Administrator

Attachments:
A – Final Conditions of Approval

FINAL CONDITIONS OF APPROVAL
COSTCO WHOLESALE WAREHOUSE EXPANSION
ZONING ADMINISTRATOR PERMIT (ZA 07-003) AND
DESIGN REVIEW (DR 07-012)
2400 MONUMENT BOULEVARD
APN: 129-040-010

PERMIT DESCRIPTION

1. These conditions apply to and constitute Zoning Administrator Permit (ZA 07-003) and Design Review (DR 07-012) approval for a 3,840 square foot expansion to the receiving dock area and 7,840 square foot enclosed garden center addition to the existing Costco Wholesale warehouse located at 2400 Monument Boulevard.

2. All conditions of approval associated with PDP 5-99 and UP 26-99 shall apply unless modified by the following conditions.

EXHIBITS

3. The following exhibits are incorporated as conditions of approval, except where specifically modified by these conditions:

	Date Received By City	Prepared by	Sheet Number
Title Sheet	July 19, 2007	David Babcock & Associates	1
Context Photos/ Aerial Plan	July 19, 2007	David Babcock & Associates	2
Concept Site Plan	August 29, 2007	David Babcock & Associates	3
Existing Floor Plan	July 19, 2007	David Babcock & Associates	4
Concept Floor Plan	July 19, 2007	David Babcock & Associates	5
Concept Roof Plan	July 19, 2007	David Babcock & Associates	6
Existing Building Elevations	July 19, 2007	David Babcock & Associates	7
Concept Building Elevations	July 19, 2007	David Babcock & Associates	8
Topographic Survey	July 19, 2007	David Babcock & Associates	C1
Preliminary Grading and Drainage Plan	July 19, 2007	David Babcock & Associates	C2

All construction plans shall conform to these exhibits except as modified by these conditions. Where a plan or further information is required, it is subject to review and approval by the Planning Division, Building Division, and/or Engineering Services/Current Development Division as required. ***(PLNG, BLDG, ENGR)***

GENERAL CONDITIONS

4. The following conditions of approval are the responsibility of the project applicant and shall be complied with prior to issuance of any construction permit unless noted otherwise. The proposed development shall comply with the applicable requirements of Federal law, State law, and the City of Concord Municipal Code. ***(PLNG, ENGR)***

5. Within 30 days of the date of the final approval or 30 days prior to submission of plans for any permit or plan check, the applicant shall submit two sets of revised plans that incorporate all revisions required by the conditions of approval, to the Planning Division for review and approval. This submittal shall occur prior to filing an application for site demolition, grading, construction, or other permit. ***(PLNG)***

6. Minor modifications such as paint colors, landscape materials or minor lot line adjustments may be allowed subject to approval by the Planning Division if found to be in substantial conformance with the approved exhibits. Substantial modifications shall require approval from the applicable decision making body. ***(PLNG, BLDG, ENGR)***

7. Prior to the issuance of a Building permit and prior to final building occupancy, an annotated copy of the Conditions of Approval noting how each condition has been satisfied, shall be submitted to the Planning Division for review and approval. ***(PLNG)***

8. Prior to any building occupancy, the applicant shall submit three signed copies (one notarized) of the "Property Maintenance Agreement" on a form approved by Planning and the City Attorney to address the repair, replacement and maintenance of all parking lot and driving surfaces, pedestrian walkways, landscaping, irrigation equipment, signs, fences and walls, building exteriors (colors and materials) and other exterior improvements. ***(PLNG, ENGR)***

ARCHITECTURAL

9. All exterior building materials, including trim and prominent exterior details, shall be in substantial compliance with the color schemes as shown on the approved color board. ***(PLNG)***

14. The installation of new television or radio antennae or satellite reception dishes are prohibited unless a Zoning Administrator permit is obtained pursuant to CMC §122-981 or said antenna(s) is exempt from permit requirements pursuant to CMC §122-982. ***(PLNG)***

LANDSCAPING

15. Any existing tree, shrub, and/or groundcover on the adjacent properties that is damaged or destroyed by construction activities shall be replaced with a like or comparable species prior to occupancy approval. ***(PLNG)***

16. No outdoor storage, display, work or other activity is permitted at any time. ***(PLNG)***

LIGHTING

17. Prior to the issuance of a building permit, the applicant shall submit plans showing all exterior lighting including: building fixtures, walkways, parking areas and streets. The height and style of fixtures shall be shown. Lighting fixtures shall be shown on the site plan and building plans. Energy-saving fixtures shall be used and noted on the plans. ***(PLNG)***

18. All exterior building lighting and parking lot lighting shall be of low intensity, directed to provide illumination for safety and installed in a manner that is directed away from adjacent properties and right-of-ways. ***(PLNG)***

PARKING

19. The existing three parking stalls located to the south side of the receiving dock area shall be designated with signage for employee parking only. ***(PLNG)***

20. All parking spaces shall be striped; full-size spaces shall measure a minimum 9 ft. by 19 ft. ***(PLNG, ENGR)***

21. Parking plans shall comply with CMC §122-843, "Off-Street Parking Facilities" and shall include drive aisle and parking stall dimensions, turning radii, back-out dimensions, driveway clearances, landscape median dimensions, and other relevant information. ***(PLNG, ENGR)***

22. Any vehicle that identifies a business by way of signage that is painted on or applied to a vehicle shall be parked in a delivery or storage area or in an area screened from view from the adjacent public right-of-way. ***(PLNG)***

23. Parking accessible to handicapped or disabled persons shall be provided as close as possible to a primary entrance, in accordance with Chapter 71 "Site Development Requirements for Handicapped Accessibility" of Title 24 of the California Code of Regulations, which includes standards for the number of stalls, size, location, signing, and striping. ***(BLDG)***

STREET IMPROVEMENTS

24. Construct all public and pedestrian facilities in accordance with the current Title 24 (Handicap Access) and the current Americans with Disabilities Act (ADA), including driveways and curb ramps. ***(ENGR)***

ENVIRONMENTAL

25. Comply with all applicable mitigation measures associated with the Final Environmental Impact Report certified by the City Council on December 14, 1999. ***(PLNG)***

NOISE

26. Noise producing site preparation and construction activities shall be limited to the days and hours as set forth below:

Monday through Friday 7:30 a.m. to 6:00 p.m.

Construction on Saturdays requires prior approval by the Building, Engineering, Neighborhood Services, and Planning Divisions

No changes to these construction hours will be allowed without the prior written consent of the City. The applicant shall designate a contact person available during the evenings and on weekends to respond to complaints and take appropriate action to reduce noise. This does not pertain to work done inside of the building. ***(BLDG, ENGR, PLNG)***

CONSTRUCTION ACTIVITIES

27. Contact Engineering Services to arrange for a pre-construction meeting prior to the start of any construction activity. ***(ENGR)***

28. Construction equipment shall not be serviced at the site at any time. Between 6:00 p.m. and 7:30 a.m. on weekdays, and between 5:00 p.m. and 8:00 a.m. on weekends and federal holidays, no deliveries shall be made to the site; no delivery vehicles (including gasoline tanker trucks) shall enter the site. Delivery vehicles shall have their engines turned off during unloading. This pertains to construction deliveries only. ***(BLDG, ENGR, PLNG)***

29. Employ the quietest construction equipment available to the maximum extent practicable, to muffle noise from construction equipment and keep all mufflers in good working order in accordance with State law. ***(BLDG, ENGR, PLNG)***

30. Implement the following measures during construction:

a. Gather all construction debris on a regular basis and place them in a dumpster or other container that is emptied or removed on a weekly basis. When appropriate, use tarps on the ground to collect fallen debris or splatters that could contribute to storm water pollution.

b. Remove all dirt, gravel, rubbish, refuse, and green waste from the street pavement, and storm drains adjoining the project site. During wet weather, avoid driving vehicles off paved areas.

c. Broom sweep the public street pavement adjoining the project site on a daily basis. Caked-on mud or dirt shall be scraped from these areas before sweeping.

d. Install filter materials (e.g., sandbags and filter fabric) at the storm drain inlet nearest the downstream side of the site in order to preclude any debris or dirt from flowing into the City storm drain system. Filter materials shall be maintained and/or replaced as necessary to ensure effectiveness and to prevent street flooding. Dispose of filter particles in an approved trash receptacle.

e. Create a contained and covered area on the site for the storage of bags, cement, paints, flammable, oils, fertilizers, pesticides, or any other materials used on the site that have the potential for being discharged to the storm drain system by being windblown or in the event of a material spill.

f. Never clean items such as machinery, tools, and brushes or rinse containers in a street, gutter, or storm drain.

g. Ensure that concrete, gunite, plaster, or similar supply trucks do not discharge wash water into street gutters or drains. ***(ENGR, BLDG)***

31. No equipment shall be started or staging area be established on the streets or the site before or after the specified hours of construction. ***(ENGR, BLDG)***

32. Ensure that no debris or construction scrap material is placed on any adjoining lot, open space area, or street and that any such material stored on an adjoining site shall be completely removed and the site cleaned prior to occupancy. ***(ENGR, BLDG)***

33. At no time shall campers, trailers, motor homes, or any other vehicle be used as living or sleeping quarters on the construction site unless authorized for site security. ***(ENGR, BLDG)***

34. There shall be no parking of construction equipment or construction worker's vehicles on residential streets at any time; all vehicles shall be maintained on-site. ***(ENGR, BLDG)***

35. Portable toilets used during construction shall be kept as far as possible from adjacent properties and shall be emptied on a regular basis as necessary to prevent odor. ***(ENGR, BLDG)***

36. Identify truck routes for the import or export of cut/fill material and/or construction debris for review and approval by the City Engineer prior to the issuance of permits. Repair any damage to city streets (private and public) caused by activity associated with this project. ***(ENGR)***

CONSTRUCTION PLAN REVIEW/PRE-PERMIT REQUIREMENTS

37. Submit two copies of preliminary title report, prepared within three months prior to plan submittal. ***(ENGR)***

38. The Improvement Plans shall show plan and profile of all proposed drainage and sewer improvements, details for parking lot, median island and loading dock construction. ***(ENGR)***

39. Design improvement plan in accordance with the City Standard Plans S-34 and S-36 for sight distance, sidewalk, back up, fencing, geometrics at intersection and corner setback requirements, prior to the acceptance of improvements. Plans shall be subject to review and approval by Engineering Services. ***(ENGR)***

40. Obtain an encroachment permit from the City prior to performing any work within the public right-of-way or public easements. ***(ENGR) CMC***

GRADING/EROSION CONTROL/GEOLOGIC

41. Submit a geotechnical report with the Grading Plans and Building Plans, pursuant to CMC Section 94-51 and Section 86-73 that addresses and provides recommendations for grading, drainage, walls, building foundations, and pavement structural sections. ***(ENGR)***

42. All grading shall require a grading and drainage plan prepared by a registered Civil Engineer, a soils report prepared by a registered Geotechnical Engineer and receipt of a grading permit approved by the City Engineer. ***(ENGR)***

43. On-site finish grading work shall require drainage to be directed away from all building foundations at a minimum slope of 2 percent and a maximum slope of 20 percent toward approved drainage facilities or swales. Non-paved drainage swales shall have a minimum slope of 1 percent. ***(ENGR)***

44. The applicant's engineer shall inspect the finished grading and certify that it conforms to the compaction and elevations shown on the Grading Plan and Soils Report. ***(ENRG) CMC***

45. Erosion control measures shall be implemented per plans approved by the City Engineer for all grading work not completed before October 15th. At the time of approval of the improvement and/or grading plans, an approved Erosion Control Plan prepared by a registered Civil Engineer shall be filed with the City Engineer. ***(ENGR)***

46. All graded slopes and stockpiles of loose soil shall be hydromulched/hydroseeded by October 15th of any given year. If during grading work between October 15th and April 15th, a rain forecast is determined, stop all grading work two (2) days before the rain forecast and implement BMP's to insure that the site is protected from erosion. ***(ENGR)***

47. Submit Grading, Erosion Control and Improvement Plans to Engineering Services for review and approval prior to the issuance of grading, encroachment, and building permits. ***(ENGR) CMC***

48. Comply with the applicable provisions of the Grading Ordinance and the Storm Water Management and Discharge Control Ordinance. ***(ENGR) CMC***

UTILITIES

49. All new utilities shall be constructed underground prior to issuance of certificate of occupancy. ***(ENGR)***

50. Coordinate all facility adjustments, relocations, or additions to utility services with the appropriate utility companies. ***(ENGR)***

51. The location of all outdoor, above-ground and/or at-grade pad mounted transformers, utility equipment, vaults, irrigation control boxes, back flow prevention devices, and the like shall be subject to approval by Planning and Engineering Services prior to the issuance of the first project permit. Such equipment shall be painted forest green or a similar color and be screened from view from the street by the building, landscaping, fencing, and/or an enclosure approved by the Planning Division. ***(ENGR, PLNG)***

DRAINAGE/STORMWATER C.3 REQUIREMENTS

52. Prevent site drainage from draining across sidewalks and driveways in a concentrated manner. ***(ENGR)***

53. Collect and convey all storm water entering, and/or originating from, the site to an adequate downstream drainage facility. ***(ENGR)***

54. Install City of Concord "No Dumping, Drains to Creek" curb marker (English and Spanish version) on all catch basins. ***(ENGR)***

55. Include erosion control/storm water quality measures in the final grading plan that specifically address measures to prevent soil, dirt, and debris from entering the storm drain system. Such measures may include, but are not limited to, hydroseeding, straw wattles, sandbags, and siltation fences and are subject to review and approval by the City. The applicant shall be responsible for ensuring that the contractor is aware of and implements such measures. ***(ENGR, BLDG)***

56. Submit a Construction Best Management Practice (BMP) Program for review and approval by Engineering Services prior to issuance of a grading permit. The general contractor and all subcontractors and suppliers of materials and equipment shall implement these BMP's. Construction site cleanup and control of construction debris shall also be addressed in this program. Failure to comply with the approved construction BMP may result in the issuance of correction notices, citations, or a project stop work order. ***(ENGR)***

57. Sweep or vacuum the parking lot(s) a minimum of once a month and prevent the accumulation of litter and debris on the site. Corners and hard to reach areas shall be swept manually. If sidewalks and/or the parking lot are pressure washed, debris must be trapped and collected to prevent entry into the storm drain system. No cleaning agent may be discharged into the storm drain. If any cleaning agent or degreaser is used, wash water shall be collected and discharged to the sanitary sewer, subject to the approval of the Central Contra Costa Sanitary District) ***(ENGR)***

58. Ensure that the area surrounding the project such as the streets stay free and clear of construction debris such as silt, dirt, dust, and tracked mud coming in from or in any way related to project construction. Areas that are exposed for extended periods shall be watered regularly to reduce wind erosion. Paved areas and access roads shall be swept on a regular basis. All trucks shall be covered. ***(ENGR)***

59. Clean all on-site storm drain facilities a minimum of twice a year, once immediately prior to October 15 and once in January. Additional cleaning may be required if found necessary by the City Engineer/Director of Building Inspection. ***(ENGR)***

SOLID WASTE/RECYCLING

60. Prior to issuance of a building permit, design and implement city approved source reduction/ recycling plan and demonstrate that interior and exterior refuse enclosures are sufficiently designed and located for the storage and pick up of recyclable materials in accordance with CMC Section 82-83 Source Reduction and Recycling. ***(PLNG)***

61. The trash bins and all refuse shall be stored within the trash enclosure and the door(s) shall be closed at all times except when the bins are being accessed to be emptied. ***(PLNG)***

62. Comply with the provisions of the CMC and with the local franchised wastehauler regarding enclosure design, access requirements, and the number of required individual refuse receptacles based upon waste pickup schedules. Verification of these facilities shall be made by the City and approved by the Planning Division prior to issuance of a building permit and the facilities shall be installed prior to final building occupancy. ***(PLNG)***

63. Prior to the issuance of a building permit, the applicant shall design and implement city-approved source reduction/recycling plans for white paper, computer paper, glass, cans, cardboard, polystyrene, paper products, and other recoverable materials in accordance with the CMC Section 82-83, Source Reduction/Recycling. ***(PLNG) CMC***

AGREEMENTS, FEES, BONDS

64. Planning Fees:

    a. Pay Condition Compliance fee per City Resolution, Fees and Charges for Various Municipal Services, within 30 days of billing by the City. Said fee shall reimburse Planning for staff work performed from the time of project approval to issuance of the certificate of occupancy for implementation of the Conditions of Approval and/or Mitigation Monitoring Program. Mitigation monitoring costs will be charged at cost over the life of the project mitigation requirements. If the initial deposit is insufficient to cover actual costs, an additional deposit in an amount determined by the Planning Manager will be required. ***(PLNG)***

    b. Prior to issuance of construction or building permits, the applicant shall pay a Document Imaging Fee per City Resolution "Fees and Charges for Various Municipal Services." Said fee shall reimburse the City for implementation of the Document Imaging and File Retention programs. ***(PLNG)***

65. All required faithful performance bonds and labor materials bonds in an amount equal to 100 percent of the approved estimates of construction costs of improvements shall be submitted to and approved by the City prior to issuance of a grading permit. ***(ENGR)***

66. All fees noted below are the fees currently in effect as of July 1, 2007 per the Resolution of Fees and Charges. The fees are adjusted annually by City Council action every June and new fees become effective as of the date set forth in the Resolution of Fees and Charges. **(ENGR)**

67. Grading Permit Application:

a. Pay the Filing Fee at the time of submittal of permit application, improvement plans and supporting documents to City Engineering Services for review. The current fee is $79.00

b. Pay Grading Permit Fees at submittal of a Grading Permit application. The current fee is determined based on cubic yardage of cut and fill combined, or at the hourly rate of $158 if the hourly rate is used.

c. Provide a $3,000 cash deposit for erosion control prior to issuance of grading permit. The deposit will be placed in a refundable account. Any unused funds will be returned at project completion. If the initial deposit is insufficient to cover actual costs, an additional deposit in an amount determined by the City Engineer will be required.

d. Pay stockpile and erosion control monitoring fee prior to issuance of grading permit. The stockpile and erosion control monitoring fee is currently $19 per calendar day and is collected for the life of the grading permit activity.

e. Pay the construction inspection fee prior to issuance of the Grading Permit. The current fee is based on 9% of the estimated cost of constructing the required improvements to support the development. ***(ENGR)***

68. Traffic Mitigation Fee:

Pay Offsite Street Improvement Program (OSIP) less possible fee credit. The OSIP Fee shall be the fee in effect at the time the building permit application is filed and is accepted as being substantially complete by the Building Division. The current OSIP Fee is $8.15 per gross square footage for Commercial Use and shall be paid prior to issuance of a Building Permit. ***(ENGR)***

OTHER/MISCELLANEOUS

69. Comply with the requirements of the Contra Costa County Health Department for the abandonment of any existing septic tanks or wells. ***(ENGR) CMC***

70. Comply with the requirements of the Contra Costa Fire Protection District. Submit complete sets of plans and specifications to the Fire District for review and approval at:

Contra Costa County Fire Protection District
2010 Geary Road
Pleasant Hill, CA 94523

Plan review fees will be assessed at that time. The City is not responsible for the collection of fees or enforcement of requirements imposed by the Fire District. ***(CCCFIRE) CMC***

71. Applicant shall defend, indemnify and hold harmless the City, its agents, officials, and employees from any claim, action or proceeding brought by a third party to set aside, annul, attack or otherwise void the permit. ***(PLNG)***

72. The permit and approval shall expire in ***one*** year from the date on which they became effective unless a building permit is obtained and construction begun. The effective date of the permit and approval is ***November 14, 2007. (PLNG)***

73. A request for a time extension from the expiration date of ***November 14, 2008*** can be considered if an application with required fee is filed at least 45 days before the original expiration date (otherwise a new application is required). A public hearing will be required for all extension applications, except those involving only Design Review. Extensions are not automatically approved. Changes in conditions, City policies, surrounding neighborhood, and other factors permitted to be considered under the law, may require, or permit denial. ***(PLNG)***

ZA ORDER NO. 12-006

OFFICE OF THE ZONING ADMINISTRATOR
CITY OF CONCORD
APPROVING ZONING ADMINISTRATOR PERMIT AND DESIGN REVIEW
ZA 11-010, DR 11-017
Applicant: Costco Wholesale
Owner: DM Jacobson & Sons, Inc.
Project Name: Costco Parking Lot Expansion

WHEREAS, on August 10, 2011, the Zoning Administrator approved a Zoning Administrator Permit (ZA 11-010) and Design Review (DR 11-017) application for Costco Wholesale to construct an employee-only parking lot at the southeast corner of Detroit Avenue and Cloverdale Avenue, APN 129-040-005; and

WHEREAS, the Zoning Administrator Permit and Design Review approval was to expire unless project construction begun within a year of the project's approval; and

WHEREAS, on June 14, 2012, Costco Wholesale filed an application to extend the Zoning Administrator Permit and Design Review approval an additional year; and

WHEREAS, the Zoning Administrator, after giving all public notices required by State law and the Concord Municipal Code, held a duly noticed public hearing on August 8, 2012 to consider the application; and

NOW, THEREFORE, BE IT RESOLVED that the Zoning Administrator does hereby extend the approval for the Costco Parking Lot Expansion Zoning Administrator Permit (ZA 11-010) and Design Review (DR 11-017) application an additional year based on the following findings:

1. The project has not changed and remains consistent with the plans approved by the Zoning Administrator on August 10, 2011.

2. The project remains consistent with the findings of approval made by the Zoning Administrator on August 10, 2011.

3. Costco has made good faith efforts to construct the project within the next year, including recent meetings with staff to discuss grading permit requirements and plan revisions required by conditions of approval.

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Based on the above findings, the Zoning Administrator approved said extension on August 8, 2012, subject to the attached Conditions of Approval, referenced as Attachment A.

G. Ryan Lenhardt
Zoning Administrator

Attachments:
A –Conditions of Approval

ATTACHMENT A

FINAL CONDITIONS OF APPROVAL

COSTCO PARKING LOT EXPANSION

ZA 11-010, DR 11-017

APN 129-040-005

PERMIT DESCRIPTION

1. These Conditions of Approval apply to and constitute the approval of a **Zoning Administrator Permit (ZA 11-010)** for an employee-only parking lot on a 1.75-acre vacant site at the southeast corner of Detroit Avenue and Cloverdale Avenue.

2. These Conditions apply to and constitute approval of **Design Review (DR 11-017)** for parking lot landscaping and related improvements.

GENERAL CONDITIONS

3. The Conditions are the responsibility of the applicant and all contractors. Compliance shall occur as specified in the Conditions or at one of the following project milestones:

   (a) Prior to Construction.
   (b) With the submittal of Grading, Improvement, Landscape, or Building Plans.
   (c) Prior to issuance of Encroachment, Grading, or Building Permits, whichever comes first.
   (d) On going during Construction.
   (e) Prior to occupancy approval.

   If timing for compliance is not specified, it shall be determined by the Divisions listed after the Condition. ***(PLNG, BLDG, ENGR)***

4. Where a plan or further information is required, it is subject to review and approval by the applicable City Department/Division, as noted at the end of each Condition. The Division listed first shall be the primary contact for implementation of that Condition. ***(PLNG, BLDG, ENGR)***

5. The development/project shall comply with all applicable Federal and State laws and Concord Municipal Code (CMC) requirements. ***(PLNG, BLDG, ENGR)***

6. Minor modifications that are found to be in substantial conformance with the approved plans such as colors, plant materials, or minor lot line adjustments, may be approved administratively. Major modifications shall be approved by the applicable decision making body. ***(PLNG, ENGR)***

7. The Conditions of Approval shall be listed on a plan sheet that is included in the construction plan set (Grading, Utility, Landscape and Building Plans). ***(PLNG, ENGR)***

8. Two annotated copies of the Conditions of Approval specifying how each applicable condition has been satisfied, shall be submitted as follows:

   a. At the time Grading, Utility, Landscape, and/or Building Plans are submitted for plan check, whichever comes first.
   b. Prior to occupancy approval. ***(PLNG, ENGR)***

9. Submit three signed copies, one notarized, of the City's "Property Maintenance Agreement", to ensure on-going repair, replacement and maintenance of all exterior improvements including parking areas, private roads, walkways, landscaping, irrigation, signs, fences, walls, and other improvements, prior to issuance of Grading or Building permits, whichever comes first. ***(PLNG)***

10. The project site and area surrounding the site shall be fenced and maintained in a weed and litter free condition for the period prior to construction. ***(BLDG, PLNG)***

LANDSCAPING

11. Provide trees/tree wells in-lieu of planters in the double-row parking area to provide additional parking depth for abutting parking spaces. ***(PLNG)***

12. Prior to issuance of a Building Permit, the Final Landscape Plan shall be peer reviewed, at the applicant's expense, by a licensed landscape architect. The plan shall be drawn on or consistent with the Grading, Improvement, Utility, and Stormwater Plans prepared by the Civil Engineer, and include the following information:

   a. A legend that lists all plant species (Latin and common name), including size, quantities, spacing, and ultimate height and width.
   b. Specifications and details for planting, including staking of trees and planting in bio-swales or other stormwater treatment areas.
   c. Utility and Grading information on the base map, screened back.
   d. Existing Heritage trees to be saved.
   e. Trees with a minimum size of 24-gallon and shrubs with a minimum size of 5-gallon or larger, except accent or sub-shrubs may be a minimum size of 1-gallon.
   f. Root control barriers and four-inch perforated pipes for parking lot trees, street trees, and trees within 6 inch of any paved area or curb.
   g. Six-inch vertical concrete curbs around landscaped areas.
   h. A soils report prepared by a soils and plant laboratory shown on the planting plan with recommendations for fertilization and mulching incorporated into the planting specifications.
   i. A Layout/Hardscape Plan showing the location and details of all non-plant improvements, with dimensions and call outs, showing finished grades, hardscape/paving treatment, planter details, arbors, trellis', fences, walls, trash enclosures, and other features.
   j. Landscaping along the site's frontage and Detroit Avenue right-of-way.

13. Landscape and irrigation plans shall meet all applicable requirements of the State Model Water Efficiency Ordinance as found in the Regional Landscape Water Conservation Ordinance prepared by the Contra Costa Water District (CCWD) dated April 29, 2010. Applicant shall submit a copy of the Certificate of Compliance from CCWD prior to the Planning Division's inspection of landscaping.

14. All landscaping shall be installed prior to occupancy. Contact the Planning Division at least two weeks prior to occupancy approval, to request a site inspection of all exterior improvements including buildings, driveways, parking lots, landscaping, irrigation, signs, lighting, walls, fences, and trash enclosures. ***(PLNG)***

15. Prior to occupancy approval, the licensed Landscape Architect shall:

    a. Conduct a final field observation and an open trench examination of the irrigation system.

    b. Provide written certification verifying that:

        i) The landscaping and irrigation system were installed in conformance with the approved landscape and irrigation plans.

        ii) The landscaping has been installed in accordance with the CCWD water conservation guidelines or the State of California Model Efficiency Water in Landscaping Ordinance.

        iii) An irrigation audit was performed and deficiencies were listed which will be corrected within 30 days.

        iv) There will be a minimum 60-day maintenance period for all landscape improvements.

    c. Provide a signed letter of compliance with the final construction documents stating that the Landscape Architect has met all State and City requirements. ***(PLNG)***

16. The establishment of plant materials shall be guaranteed for a period of two years after final inspection approval. A cash or equivalent guarantee shall be posted in an amount equal to 10 % of the value of the improvements, which will be released upon final inspection and acceptance of landscape improvements by a registered landscape architect at the end of the two-year period. ***(PLNG)***

FENCES/WALLS

17. A minimum four foot high decorative metal fence shall be installed around the site. Applicant shall work with staff and the property owner of 2750 Cloverdale Avenue on locating the fence so that access is provided for maintaining the existing buildings abutting the southeast corner. ***(PLNG)***

18. The parking lot shall be secured when not in use with a gate or bollards and chain at the parking lot entrance. ***(PLNG)***

TREE PRESERVATION

19. All existing trees within the project boundaries shall be preserved. ***(PLNG)***

20. Prior to demolition, site preparation, grading, or construction activity on a site with trees to be preserved , the following measures from CMC §114-68, shall be required:

a. All trees to be preserved shall be clearly indicated on the Grading, Utility, Civil Site, and Landscape Plans.

b. A temporary six foot fence shall be installed around the drip line of the trees, prior to on-site activity such as grading and construction activities. Prior to grading or construction, the City shall inspect and approve the placement of the fencing.

c. No grading, compaction, stockpiling, trenching, paving or change in ground elevation shall be permitted within the drip line of any tree to be saved, until a report prepared by a certified arborist has been submitted to and approved by the City, providing specific guidelines for each case.

d. No construction waste, either liquid or solid or other substance (oil, gasoline, chemicals, or other harmful materials) shall be deposited, disposed of, or stored, within the drip line or within an area near the tree, which could enter into the root system of the tree.

e. Wires, signs, ropes, pulleys, etc., shall not be attached to any tree.***(PLNG, PARKS)*** **CMC**

21. Comply with the Tree Protection Recommendations contained in the tree survey prepared by SBCA Tree Consulting dated July 5, 2011. One year after final inspection of the parking lot, a Certified Arborist, retained by the applicant at their expense, shall evaluate tree health, vigor and acclamation to the new environment. The arborist shall identify measures to restore the health of any heritage trees that are found to be in poor condition due to the impact of the project. If the tree cannot be restored, replacement trees shall be required at a ratio and size consistent with the value of the damaged tree. ***(PARKS, PLNG)***

LIGHTING

22. Show all exterior lighting including: building fixtures, walkway lighting, parking lot lighting, and street lights on the Site, Utility, Landscape, and Building Plans, prior to the issuance of any permits. The height and style of fixtures shall be shown. Energy-saving fixtures shall be used and noted on the plans. ***(PLNG, ENGR, BLDG)***

23. All exterior building and parking lot lighting shall provide illumination for safety and shall be installed in a manner that is glare shielded and directed away from adjacent properties and right-of-ways. ***(PLNG)***

24. Submit a photometric plan for review and approval, showing the location of all light sources, streetlight spacing, intensity of luminance, and uniformity ratio, in accordance with the City's specifications, with the Improvement, Utility, or Building Plans, whichever comes first. The photometric analysis shall be reviewed by Engineering Services for the determination of streetlight spacing. ***(ENGR, TRANS, BLDG, PD)***

SIGNAGE

25. Provide signage that clearly designates the parking lot as employee-only parking subject to review and approval of the Planning Division. Submit construction plans showing details for

installation, dimensions, font, logos, materials and colors, including a sample of all materials and colors for review and approval prior to the issuance of a Sign Permit. ***(PLNG)***

26. All signage shall comply with the City of Concord Sign Ordinance. ***(PLNG)*** **CMC**

27. Pennants, banners, streamers, or flags in connection with special promotions and business openings are not allowed in the employee parking lot. ***(PLNG)*** **CMC**

28. One sign denoting the architect, engineer, or contractor associated with the project may be permitted on site. The maximum sign area shall be 12 sq. ft. within single family districts and 40 sq. ft. for other districts, of which 32 sq.ft. may be for the general contractor. These signs shall be removed upon occupancy approval. ***(PLNG)*** **CMC**

PARKING

29. All parking spaces shall be striped; full-size spaces shall be 9 ft. by 19 ft; compact spaces shall be 8 ft. by 16 ft. Wheel stops shall be provided, except when parking spaces abut a concrete curb for a landscaped planter, then a two foot overhang is allowed. ***(PLNG, ENGR)*** **CMC**

30. A maximum of 50 percent of the required parking spaces may be compact. Compact stalls shall be clearly identified. ***(PLNG, ENGR)*** **CMC**

31. Re-stripe the store parking lot to provide additional handicap parking in compliance with Chapter 11 "Site Development Requirements for Handicapped Accessibility" of Title 24 of the California Code of Regulations. The existing number of parking spaces at the store site shall not be reduced. Submit striping plans for review and approval prior to issuance of a Building Permit. ***(PLNG/BLDG)***

STREET IMPROVEMENTS

32. Dedicate a 5'-6" right-of-way to the City along Cloverdale Avenue frontage prior to issuance of construction permits. ***(ENGR)***

33. Construct improvements along the frontage on Cloverdale Avenue and Detroit Avenue including but not limited to: driveway removal; pavement replacement 9 feet wide measured perpendicular from face of curb on Cloverdale Avenue; pavement widening; concrete valley gutter; wheel chair ramps; construction of concrete curb, gutter and sidewalk; ADA compliant concrete driveway approach; storm drainage system; conforms to existing improvements; and repair/replacement of deficient frontage improvements as determined by the City Engineer, prior to occupancy or acceptance of improvements. ***(ENGR)***

34. Construct all public facilities in accordance with the current Americans with Disabilities Act (ADA), including driveways and curb ramps. ***(ENGR)***

NOISE

35. Noise producing site preparation and construction activities shall be limited to the days and hours as set forth below:

Monday through Friday.....7:30 a.m. to 6:00 p.m.

Construction on Saturdays may be allowed only upon prior approval by the Building, Engineering, and Planning Divisions. No changes to these construction hours shall be allowed without the prior written consent of the City. A contact person shall be available during all construction activities in the evening and on weekends to respond to complaints and take actions necessary to reduce noise. ***(BLDG, ENGR, PLNG)***

CONSTRUCTION ACTIVITIES

36. Contact Engineering Services to arrange for a pre-construction meeting prior to issuance of Grading or Building Permits, whichever comes first. ***(ENGR)***

37. Implement a dust and construction noise control plan. Submit the plan to Engineering Services for review and approval prior to. ***(ENGR)***

38. Construction equipment shall not be serviced at the site at any time. Between 6:00 p.m. and 7:30 a.m. on weekdays, and between 5:00 p.m. and 8:00 a.m. on weekends and federal holidays, no deliveries shall be made to the site; no delivery vehicles (including gasoline tanker trucks) shall enter the site. Delivery vehicles shall have their engines turned off during unloading. ***(BLDG, ENGR, PLNG)***

39. Employ the quietest construction equipment available, to muffle noise from construction equipment and keep all mufflers in good working order in accordance with State law. ***(BLDG, ENGR, PLNG)***

40. Implement the following measures during construction:
    a. Gather all construction debris on a regular basis and place them in a dumpster or other container that is emptied or removed on a weekly basis. When appropriate, use tarps on the ground to collect fallen debris or splatters that could contribute to storm water pollution.
    b. Remove all dirt, gravel, rubbish, refuse, and green waste from the street pavement, and storm drains adjoining the project site. During wet weather, avoid driving vehicles off paved areas.
    c. Broom sweep the public street pavement adjoining the project site on a daily basis. Caked-on mud or dirt shall be scraped from these areas before sweeping.
    d. Install filter materials (e.g., sandbags and filter fabric) at the storm drain inlet nearest the downstream side of the site in order to preclude any debris or dirt from flowing into the City storm drain system. Filter materials shall be maintained and/or replaced as necessary to ensure effectiveness and to prevent street flooding. Dispose of filter particles in an approved trash receptacle.
    e. Create a contained and covered area on the site for the storage of bags, cement, paints, flammable, oils, fertilizers, pesticides, or any other materials used on the site that have the potential for being discharged to the storm drain system by being windblown or in the event of a material spill.

f. Never clean items such as machinery, tools, and brushes or rinse containers in a street, gutter, or storm drain.

g. Ensure that concrete, gunite, plaster, or similar supply trucks do not discharge wash water into street gutters or drains. ***(ENGR, BLDG)***

41. No equipment shall be started or staging area be established on the streets or the site before or after the specified hours of construction. ***(ENGR, BLDG)***

42. Ensure that no debris or construction scrap material is placed on any adjoining lot, open space area, or street, and that any such material stored on an adjoining site shall be completely removed and the site cleaned, prior to occupancy approval. ***(ENGR, BLDG)***

43. At no time shall campers, trailers, motor homes, or any other vehicle be used as living or sleeping quarters on the construction site unless authorized for site security. ***(ENGR, BLDG)***

44. There shall be no parking of construction equipment or construction worker's vehicles on residential streets at any time; all vehicles shall be maintained on-site. ***(ENGR, BLDG)***

45. Portable toilets used during construction shall be kept as far as possible from adjacent properties and shall be emptied on a regular basis as necessary to prevent odor. ***(ENGR, BLDG)***

46. Identify truck routes for the import or export of cut/fill material and/or construction debris for review and approval by the City Engineer prior to the issuance of permits. Repair any damage to city streets (private and public) caused by activity associated with this project. ***(ENGR)***

47. In the event of the encounter of subsurface materials suspected to be of an archaeological or paleontological nature, all grading and/or excavation shall cease, the find shall be left untouched, and the City Planning Division shall be immediately notified. The County Coroner and the Native American Heritage Commission shall also be notified and the procedures required in §15064.5 of CEQA shall be followed. This requirement shall be noted on the Grading and Building Plans, prior to issuance of permits. ***(PLNG, ENGR, BLDG)***

48. In the above event, retain a qualified professional archaeologist certified by the Register of Professional Archaeologists or paleontologist with a degree(s) in paleontology or geology, to evaluate and make recommendations as to disposition, mitigation and/or salvage. The recommendation shall be implemented before work may proceed. The applicant shall be liable for all costs associated with the professional investigation and implementation. ***(PLNG, ENGR, BLDG)***

CONSTRUCTION PLAN REVIEW/PRE-PERMIT REQUIREMENTS

49. Submit two copies of preliminary title report, prepared within three months prior to plan submittal. ***(ENGR)***

50. The Improvement Plans shall show frontage improvements including but not limited to: drainage improvements, curb, gutter and sidewalk per City Standard Detail S-10, and driveway construction per City Standard Detail S-14 and repair/replacement of deficient frontage

improvements as determined by the City Engineer. Any unusable existing driveway shall be replaced with standard curb, gutter, and sidewalk per S-10 above. Any trenching for utility installation shall comply with the modified City Standard Detail S-17 for pavement repair and possible slurry placement. ***(ENGR)***

51. The Improvement Plans shall show plan and profile of all proposed street, drainage and sewer improvements and details for curb, gutter, sidewalk, and driveway construction. ***(ENGR)***

52. Design improvements in accordance with the City Standard Plans S-34 and S-36 for sight distance, sidewalk, back up, fencing, geometrics at intersection and corner setback requirements, prior to the acceptance of improvements. Plans shall be subject to review and approval by Engineering Services. ***(ENGR)***

53. Obtain an encroachment permit from the City prior to performing any work within the public right-of-way or public easements. ***(ENGR) CMC***

GRADING/EROSION CONTROL/GEOLOGIC

54. Grading on adjacent properties shall require written approval from the affected property owners. ***(ENGR)***

55. On-site finish grading work shall require drainage to be directed away from all building foundations at a minimum slope of 2 percent and a maximum slope of 20 percent toward approved drainage facilities or swales. Non-paved drainage swales shall have a minimum slope of 1 percent. ***(ENGR)***

56. The project engineer shall inspect the finished grading and certify that it conforms to the compaction and elevations shown on the Grading Plan and Soils Report. ***(ENGR) CMC***

57. At all times seasonally appropriate erosion control measures shall be implemented per plans approved by the City Engineer for all grading work at all times. Wet season measures shall be in place October through April at a minimum and when rain is otherwise predicted. At the time of approval of the Improvement and/or Grading Plans, an approved Erosion Control Plan prepared by a registered Civil Engineer shall be filed with the City Engineer. ***(ENGR)***

58. All graded slopes and stockpiles of loose soil shall be hydromulched/hydroseeded by October of any given year. During grading work between October and April, if rain is forecast, stop all grading work two days before the rain forecast and implement BMPs to insure that the site is protected from erosion. ***(ENGR)***

59. Submit Grading, Erosion Control, Improvement, Stormwater Pollution Prevention Plan (SWPPP), and Stormwater Control Plans to Engineering Services for review and approval prior to the issuance of Grading, Encroachment, and Building Permits. Where applicable, evidence of compliance with the State General Construction Permit shall be provided. ***(ENGR) CMC***

60. Comply with the applicable provisions of the Grading Ordinance and the Storm Water Management and Discharge Control Ordinance. ***(ENGR) CMC***

61. Design improvements in accordance with the City Standard Plans S-34 and S-36 for sight distance, sidewalk, back up, fencing, geometrics at intersection, and corner setback requirements, prior to the acceptance of improvements. Plans shall be subject to review and approval by Engineering Services. ***(ENGR) CMC***

UTILITIES

62. New electrical transformers shall be placed underground or screened from view. ***(PLNG, ENGR)***

63. No above ground utility facilities/structures shall be located between the face of curb and back of sidewalk in the public right-of-way. ***(ENGR)***

DRAINAGE/STORMWATER C.3 REQUIREMENTS

64. Submit a Stormwater Control Plan (SWCP) prepared in accordance with the current Contra Costa Clean Water Program Stormwater C.3 Guidebook for review and approval by Engineering Services prior to issuance of any permit. The SWCP shall be prepared and certified by a Civil Engineer, registered in the State of California, demonstrating an understanding of the design of treatment measures for water quality and groundwater protection principles applicable to the project site. ***(ENGR)***

65. Prior to issuance of permits for building, site improvements, or landscaping, applicant shall submit a permit application consistent with the applicant's approved Stormwater Control Plan (SWCP), and include drawings and specifications necessary for construction of site design features, measures to limit directly connected impervious area, pervious pavements, self-retaining areas, treatment BMP's, permanent source control BMP's, and other features that control stormwater flow and potential stormwater pollutants. The Contra Costa Clean Water Program permit application shall include a completed "Construction Plan C.3 Checklist" as described in the Stormwater C.3 Guidebook, and a detailed draft Stormwater BMP Operation and Maintenance Plan consistent with the general O&M plan included in the applicant's approved Stormwater Control Plan. Guidelines for the preparation of Stormwater BMP Operation and Maintenance Plans are in Appendix F of the Stormwater C.3 Guidebook. ***(ENGR)***

66. Construct stormwater treatment measures per the approved SWCP prior to occupancy approval. ***(ENGR)***

67. Submit a final Stormwater BMP Operation and Maintenance Plan (O&M Plan) in accordance with City of Concord Guidelines, for review and approval by Engineering Services, prior to occupancy approval. This O&M Plan shall incorporate City comments on the draft O&M Plan and any revisions resulting from changes made during construction. The implementation of the O&M Plan shall be the responsibility of the property owner or the HOA where one exists. ***(ENGR)***

68. Execute any agreements identified in the SWCP which pertain to the transfer of ownership, right-of-entry for inspection or abatement, and/or long-term maintenance of stormwater treatment or hydrograph modification BMPs, prior to occupancy approval. ***(ENGR)***

69. Prevent site drainage from draining across sidewalks and driveways in a concentrated manner. ***(ENGR)***

70. Install City of Concord "No Dumping, Drains to Creek" curb marker (English and Spanish version) on all catch basins. ***(ENGR)***

71. Sweep or vacuum the parking lot(s) a minimum of once a month and prevent the accumulation of litter and debris on the site. Corners and hard to reach areas shall be swept manually. If sidewalks and/or the parking lot are pressure washed, debris must be trapped and collected to prevent entry into the storm drain system. No cleaning agent may be discharged into the storm drain. If any cleaning agent or degreaser is used, wash water shall be collected and discharged to the sanitary sewer, subject to the approval of the Central Contra Costa Sanitary District). ***(ENGR)***

72. Ensure that the area surrounding the project such as the streets stay free and clear of construction debris such as silt, dirt, dust, and tracked mud coming in from or in any way related to project construction. Areas that are exposed for extended periods shall be watered regularly to reduce wind erosion. Paved areas and access roads shall be swept on a regular basis. All trucks shall be covered. ***(ENGR)***

73. Clean all on-site stormdrain facilities a minimum of twice a year, once immediately prior to October 15 and once in January. Additional cleaning may be required if found necessary by the City Engineer/Director of Building Inspection. ***(ENGR, BLDG)***

SOLID WASTE/RECYCLING

74. Comply with Concord Municipal Code Chapter 82, Solid Waste, Article V, Construction and Demolition (C&D) Waste Recycling, Sections 82-114 through 82-126, as applicable. ***(BLDG)***

75. Provide trash receptacles for the proposed employee parking area. Prior to issuance of a Building Permit, submit plans showing location of new trash receptacles and details/cut sheet of receptacle design for Planning Division approval. ***(PLNG)***

AGREEMENTS, FEES, BONDS

76. Provide a $5,000 cash deposit to the Planning Division to cover Condition Compliance and Document Imaging Fee. Staff's time will be charged to this deposit for work performed to implement the Conditions of Approval, from the time of project approval to occupancy approval. The deposit will be placed in a refundable account and any unused funds will be returned upon completion. If the initial deposit is insufficient to cover actual costs, an additional deposit in an amount determined by the Project Planner will be required (per City Resolution, Fees and Charges for Various Municipal Services). ***(PLNG)***

77. Encroachment Permit Application:

a. Pay the Filing Fee at the time of submittal of permit application, improvement plans and supporting documents to City Engineering Services for review.

b. Provide a restoration security before issuance of the Encroachment Permit. The security shall be in an amount sufficient to restore existing public improvements to a serviceable condition should development improvement activity cause damage. The amount of the security shall be determined by, and be in a form acceptable to the City Engineer.

c. Provide a $10,000 cash deposit to cover Condition Compliance/Mitigation Monitoring costs at the time of submittal of plans and documents to Engineering Services for review. The deposit will be placed in a refundable account. Condition Compliance/Mitigation Monitoring costs will be charged to this deposit over the life of the project permit and mitigation requirements. Any unused funds will be returned at project completion. If the initial deposit is insufficient to cover actual costs, an additional deposit in an amount determined by the City Engineer will be required. ***(ENGR)***

78. Grading Permit Application:

a. Pay Grading Permit Fees at submittal of a Grading Permit application.

b. Provide a $10,000 cash deposit for Erosion Control prior to issuance of Grading Permit. The deposit will be placed in a refundable account. Any unused funds will be returned at project completion. If the initial deposit is insufficient to cover actual costs, an additional deposit in an amount determined by the City Engineer will be required.

c. Pay Stockpile and Erosion Control Monitoring fee prior to issuance of Grading Permit. ***(ENGR)***

OTHER/MISCELLANEOUS

79. Comply with the requirements of the Contra Costa Fire Protection District. Submit complete sets of plans and specifications to the Fire District for review and approval at:

Contra Costa County Fire Protection District
2010 Geary Road
Pleasant Hill, CA 94523

Plan review fees are assessed at that time. The City is not responsible for the collection of fees or enforcement of requirements imposed by the Fire District. ***(CCCFIRE)***

80. Applicant shall defend, indemnify and hold harmless the City, its agents, officials, and employees from any claim, action or proceeding brought by a third party to set aside, annul, attack or otherwise void the permit. ***(PLNG)***

81. The Zoning Administrator Permit approval is extended an additional year. The permit and approval shall expire by August 10, 2013 unless construction permits are obtained and work has begun prior to the expiration of the permit. ***(PLNG)***

EXHIBIT B

Fueling Facility Expansion
Costco Wholesale
2400 Monument Blvd., Concord, CA
APN #129040010
Costco Loc. No. 663 / Our Job No. 7340
April 30, 2015

Project Narrative

Expansion of the fueling facility will consist of one (1) additional multi-product dispenser (MPD) on the entry side of all four (4) existing fueling islands, resulting in eight (8) additional fueling positions. A 36-foot by 120-foot fueling island canopy addition (approximately 4,320 square feet) will be constructed to provide weather protection for the MPDs. The expansion also includes the installation of one (1) 20,000-gallon diesel product underground storage tank (UST), installation of one (1) 3,500-gallon gasoline/diesel split additive UST, and associated product piping. The two (2) fueling islands closest to the warehouse [six (6) MPDs totaling twelve (12) fueling positions] will be equipped to dispense both gasoline and diesel product. Associated site improvements include the removal of five (5) parking stalls for the addition of an 800 square foot water quality bio-retention area.

The Costco Wholesale site was originally approved under Use Permit No. 26-99 in 1999 and built immediately after approval. In 2001, the Use Permit was amended to expand the fueling facility (UP 2-01) with one (1) fueling island containing two (2) multi-product dispensers. This expansion will also be reviewed as an amendment to the existing Use Permit, and Design Review approval will be required.

The present application for expansion is consistent with the findings and environmental determination of the 2001 CUP, and the improvement will provide an added benefit to the site's existing membership base. The expansion is not anticipated to generate a significant number of new trips to the fueling facility. Instead, the expansion is expected to provide a more efficient fuel purchasing experience for the members already utilizing the fueling facility by reducing wait times, vehicle queuing, and vehicle idling. The existing hours of operation, 5:00 am to 10:00 pm, and employee staffing levels, one (1) attendant per shift, will remain unchanged with this project.

The canopy addition will match the existing canopy design, materials, and color. Costco Gasoline canopy signage, approximately 27 square feet in size on each canopy facade, will remain on three (3) of the facades. The signage on the entry facade will be relocated and centered on the canopy addition.

The project acknowledges the Costco parking lot addition north of Detroit Avenue as the overall parking count for the site has increased. The result of both projects is an overall parking stall count of 944 spaces, or 5.89 spaces per 1,000 square feet. The project will reduce the overall parking count to 939 stalls, which still exceeds the minimum stall count identified in the City's Zoning Code for Shopping Centers (642 spaces).

Landscaping includes a newly created bio-retention area, approximately 800 square feet, and landscape screening for the new UST vents which will be located within the side yard landscaping.

Construction of the expansion will be in a single phase. The existing fueling facility will remain open during construction.

Project Use Permit Amendment Findings

Section 122-1003 of the Concord Development Code defines the findings that must be made by the Planning Commission prior to approving the Use Permit Amendment for the above defined project. The following lists each Use Permit approval finding found in the Development Code along with a response that describes how the project satisfies each finding.

Finding 1: The proposed use is allowed within the applicable Zoning District and complies with all other applicable provisions of the Development Code and the Concord Municipal Code.

Response: The fueling facility is an allowed use in the Regional Commercial (RC) District subject to a Use Permit approval. The project is an expansion of an existing use that was approved in 1999 and constructed shortly afterwards. The project complies with applicable provisions of the Development Code and Municipal Code including Section 122-622, which specifically applies to gas stations. This section includes specific setbacks for pump islands, minimum lot sizes, and equipment screening standards. The project is compatible with these standards.

Finding 2: The proposed use is consistent with the General Plan and any applicable Specific Plan.

Response: The City's General Plan Map designates the site for Regional Commercial. The expansion is a use consistent with this designation. The Land Use Element of the General Plan identifies encouragement and support of regional commercial centers as a focus for the City. The following principle and policies highlight this point:

- Principle LU-3.1: Foster Strong Region-Serving Commercial Centers.
- Policy LU-3.1.2: Maintain and enhance existing region-serving centers so that they are competitive and offer a wide spectrum of retail products.
- Policy LU-3.1.3: Encourage existing region-serving centers to expand or adapt to market changes through reuse, rehabilitation, and infill development.

The proposed expansion of this established use is within an established commercial center that has serviced the region for over a decade. This expansion is consistent with these land use policies because it is an improvement that responds to membership demands and keeps the regional Costco competitive. The project is scaled to effectively and efficiently service current and anticipated future demands for the site and anticipates providing reduced queuing wait times and reduced queuing congestion during peak service hours.

The project is also consistent with safety elements of the General Plan. With regard to the air quality section of the Safety and Noise Chapter of the General Plan, the City has adopted the following:

- Goal S-1: Air quality that meets State and Federal standards.

- Policy S-1.1.4: Require developers on a case-by-case basis to comply with the Bay Area Air Quality Management District regulations in effect at the time of project approval, including regulations relating to dust, toxic air contaminants (TACs), odors, and other air pollutants or air quality issues.
- Policy S-1.1.5: Coordinate with the Bay Area Air Quality Management District (BAAQMD) when addressing air quality issues related to local land use proposals.

The project addresses this goal and associated policies by utilizing the latest equipment and technology, along with operating procedures that meet or exceed federal and Bay Area Air Quality Management District regulations. The established gasoline throughput limits approved for the site will continue with the expansion, and all Bay Area Air Quality Management permits required for the project will be obtained prior to construction.

Finally, the General Plan indicates support for the project in the Economic Vitality chapter with the following policy:

- Policy E-2.1.2: Retain and attract business and facilitate businesses' efforts to develop and expand.

The expansion will allow Costco to provide a more efficient fuel purchasing experience for the members already utilizing the fueling facility. Costco's continued investment in the site demonstrates their commitment to the community and according to the above economic policy should be supported by the City.

Finding 3: The design, location, size, and operating characteristics of the proposed activity are compatible with the existing and future land uses in the vicinity.

Response: The project is an expansion to the existing fueling facility. The canopy addition will match the existing canopy and be a proportionate size. The expansion is toward the side yard of the site which will have no impact on the existing frontage along Monument Boulevard. The operation of the fueling facility will remain unchanged except that it is anticipated that members will be able to refuel with reduced queuing wait times. The reduction in the fueling queue is a benefit to the existing members and surrounding community.

Finding 4: The site is physically suitable for the type, density, and intensity of the proposed use, including access, utilities, and the absence of physical constraints.

Response: The site is located in the Regional Commercial District and has the area to accommodate this expansion. Access to the site is from Monument Boulevard and Detroit Avenue without constraint. The established circulation patterns will remain unchanged with this expansion, but congestion associated with queuing during peak operating hours should be reduced with this project.

Finding 5: Granting the permit would not be detrimental to the public health, safety, or welfare of the persons residing or working in the subject neighborhood or materially

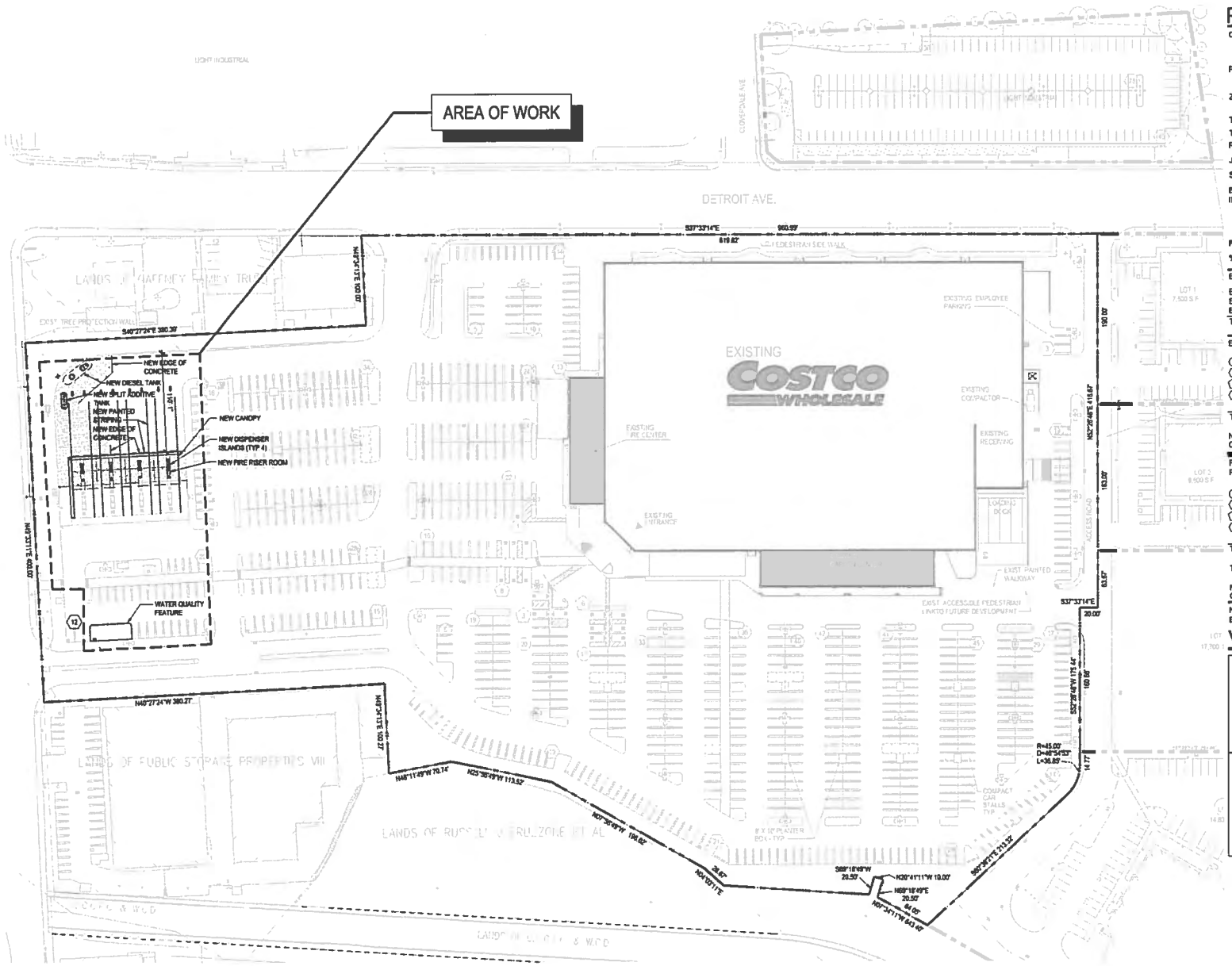
detrimental or injurious to property or improvements in the vicinity and Zoning District where the property is located.

Response: This project is an expansion of an existing fueling facility that has operated in the within the neighborhood for over a decade. The prior land use approvals determined that the facility would not be detrimental to the public health, safety, or welfare of the area. The Project Narrative identified the improvements associated with this project. The operational impact of these improvements are anticipated to be reduced wait times and vehicle idling, along with and additional water quality element. A more efficiently operated facility will benefit the health, safety, and welfare of the members and surrounding properties by mitigating existing fueling facility congestion and likely reducing exhaust associated with vehicle idling during peak hour queuing.

The additional parking lot landscaping, approximately 800 square feet, represents an improvement to the site with the incorporation of a bio-retention storm drainage area and additional trees to provide increased parking lot shading. Plant materials selected for the expanded landscape are consistent with the overall landscape pattern. The expanded fueling area will connect to the existing under canopy stormwater system which is hydraulically isolated from the queuing area and conveyed to an oil water separator for treatment before discharge to the public storm drainage system. This process is implemented to safeguard the downstream stormwater system for the health and safety of the neighborhood. These improvements should provide a net benefit to the area and will not be a detriment.

Finding 6: If the Review Authority determines that it is not possible to make all of the required findings for approval of the project as submitted or as modified with conditions, the application shall be denied. The specific basis for denial shall be established for the record.

Response: Based on the forgoing findings, the Planning Commission is justified in approving the Use Permit Amendment and Design Review for this project.



PROJECT DATA

CLIENT	COSTCO WHOLESALE 999 LAKE DRIVE ISSAQUAH, WA 98027
PROJECT ADDRESS:	2400 MONUMENT BLVD. CONCORD, CA
ZONING:	PLANNED INDUSTRIAL PARK (PI) AND PLANNED DISTRICT (PD)
TOTAL SITE AREA:	21.40 ACRES (932,323 S.F.)
TOTAL COSTCO AREA:	15.75 ACRES (686,232 S.F.)
RESIDUAL PARCEL.	5.50 ACRES (239,580 S.F.)
JURISDICTION:	CITY OF CONCORD
SETBACKS:	10'; 20' ALONG DETROIT AVE. - NO CHANGE
BOUNDARIES INFORMATION:	THIS PLAN HAS BEEN PREPARED BY USING INFORMATION PROVIDED BY KIER & WRIGHT ENGINEERS, DATED 05/08.
FLOOR AREA RATIO:	0.51%
% LOT COVERAGE:	17.7%

BUILDING DATA:	
EXIST. BUILDING AREA	146,788 S.F.
EXIST. TIRE CENTER	5,767 S.F.
EXIST. GARDEN CENTER	7,813 S.F.
TOTAL EXIST. BUILDING	160,368 S.F.

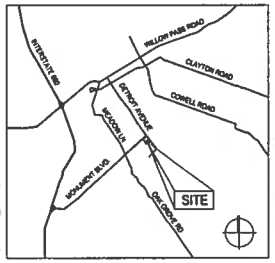
EXISTING PARKING DATA:	
(P) 10' WIDE STALLS	397 STALLS
(P) 9' WIDE STALLS	369 STALLS
(P) ACC ACCESSIBLE STALLS	16 STALLS
(P) 9' WIDE STALLS OFF-SITE EMPLOYEE PARKING	162 STALLS
TOTAL EXISTING PARKING	944 STALLS
NO. OF STALLS PER 1000 S.F. OF EXIST. BUILDING AREA:	5.89 STALLS

PROPOSED PARKING DATA: PROPOSED GAS STATION EXPANSION:	
(P) 10' WIDE STALLS	397 STALLS
(P) 9' WIDE STALLS	364 STALLS
(P) ACC ACCESSIBLE STALLS	16 STALLS
(P) 9' WIDE STALLS OFF-SITE EMPLOYEE PARKING	162 STALLS
TOTAL PARKING	939 STALLS
TOTAL PARKING LOST	5 STALLS
NO. OF STALLS PER 1000 S.F. OF BUILDING AREA:	5.85 STALLS

NOTES:
EXISTING CONDITIONS TO BE FIELD VERIFIED.

0 25' 50' 100'
1"=50'-0"

VICINITY MAP



COSTCO WHOLESALE
CONCORD, CA
663
2400 MONUMENT BLVD.
CONCORD, CA 94518

MULVANNY G2
1110 112TH AVE. NE | SUITE 500
BELLEVUE, WA | 98004
t 425.463.2000 | f 425.463.2002
MulvannyG2.com

98-2030-20
MAY 4, 2015
CONCEPT
SITE PLAN

DD11-12

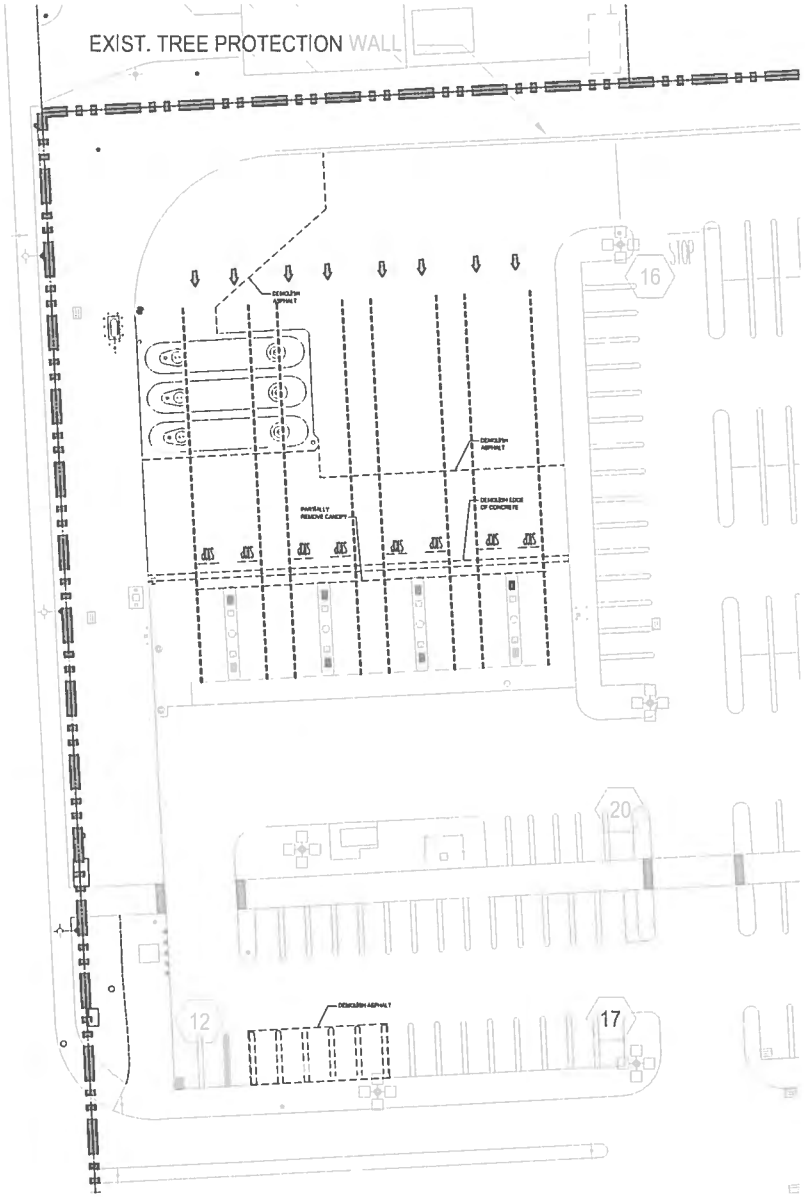
EXHIBIT C

COSTCO WHOLESALE

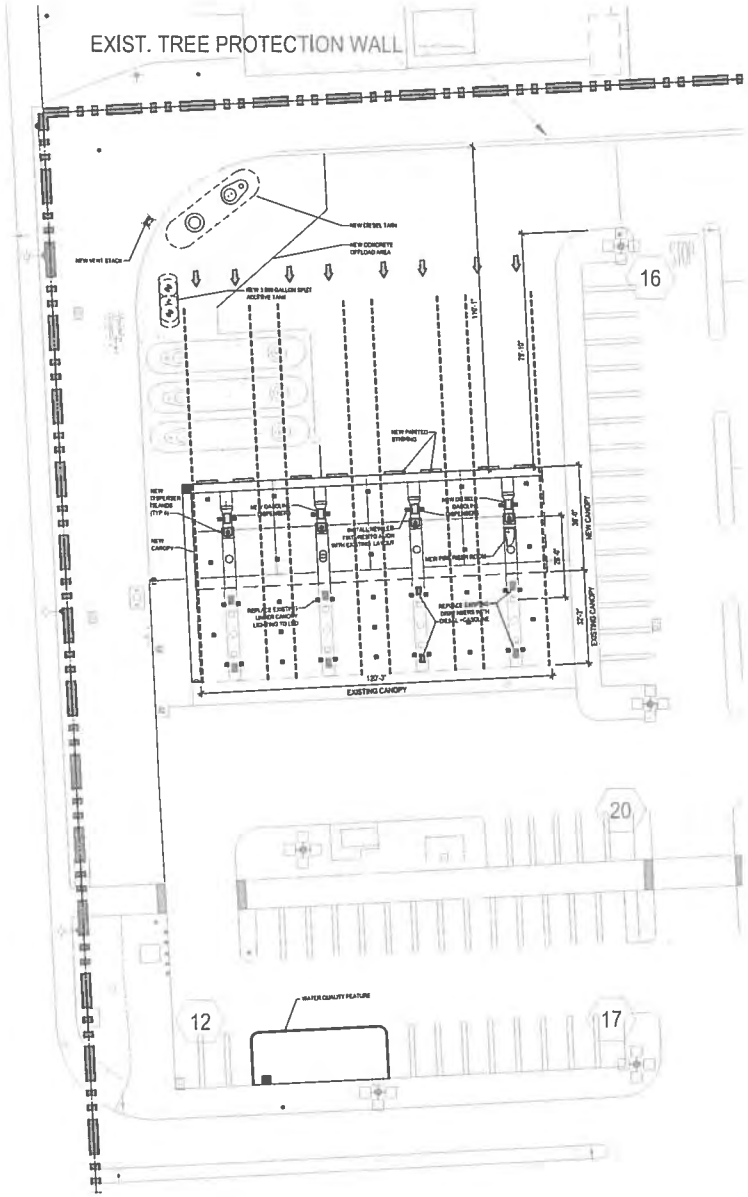
CONCORD, CALIFORNIA

CONCEPT SITE PLAN

MAY 4, 2015



1 DEMOLITION PLAN
SCALE: 1" = 20'-0"



2 ENLARGED SITE PLAN
SCALE: 1" = 20'-0"

0 10' 20' 40'
1'-0" = 20'-0"

COSTCO WHOLESALE

CONCORD, CA
663

2400 MONUMENT BLVD.
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t 425.463.2000 | f 425.463.2002

MulvannyG2.com

98-2030-20
MAY 4, 2015

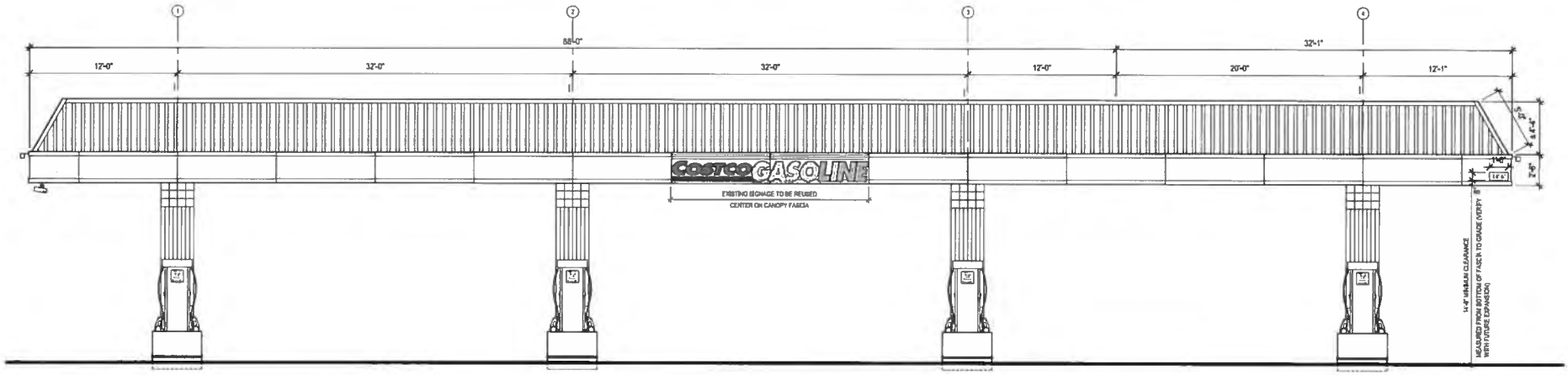
ENLARGED SITE & DEMOLITION PLANS

DD11-12A

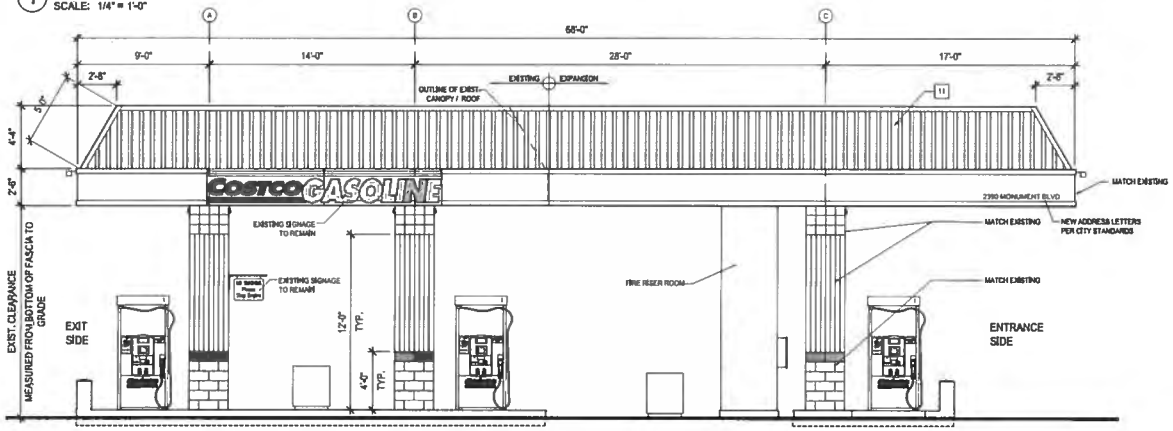
COSTCO WHOLESALE ENLARGED SITE & DEMO PLANS

CONCORD, CALIFORNIA

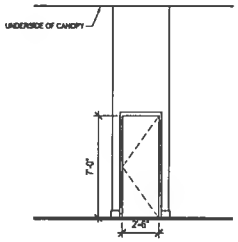
MAY 4, 2015



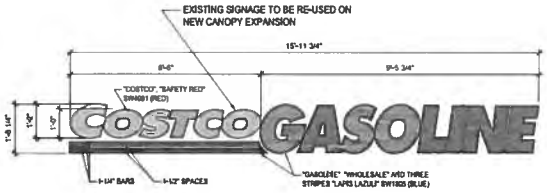
1 SOUTH ELEVATION
SCALE: 1/4" = 1'-0"



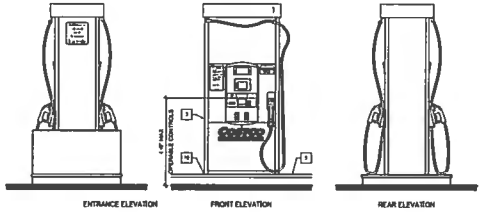
2 EAST ELEVATION (WEST SIM)
SCALE: 1/4" = 1'-0"



3 FIRE RISER ELEVATION
SCALE: 1/4" = 1'-0"



4 EXISTING CANOPY SIGN
SCALE: 1/2" = 1'-0"



5 DISPENSER ELEVATIONS
SCALE: 3/8" = 1'-0"

1'-0" = 20'-0"

COSTCO WHOLESALE
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98-2030-20
MAY 4, 2015
ELEVATIONS

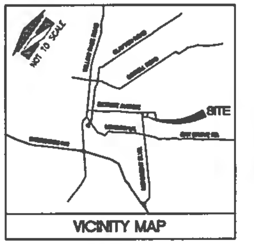
DD11-12A

COSTCO WHOLESALE

CONCORD, CALIFORNIA

ELEVATIONS

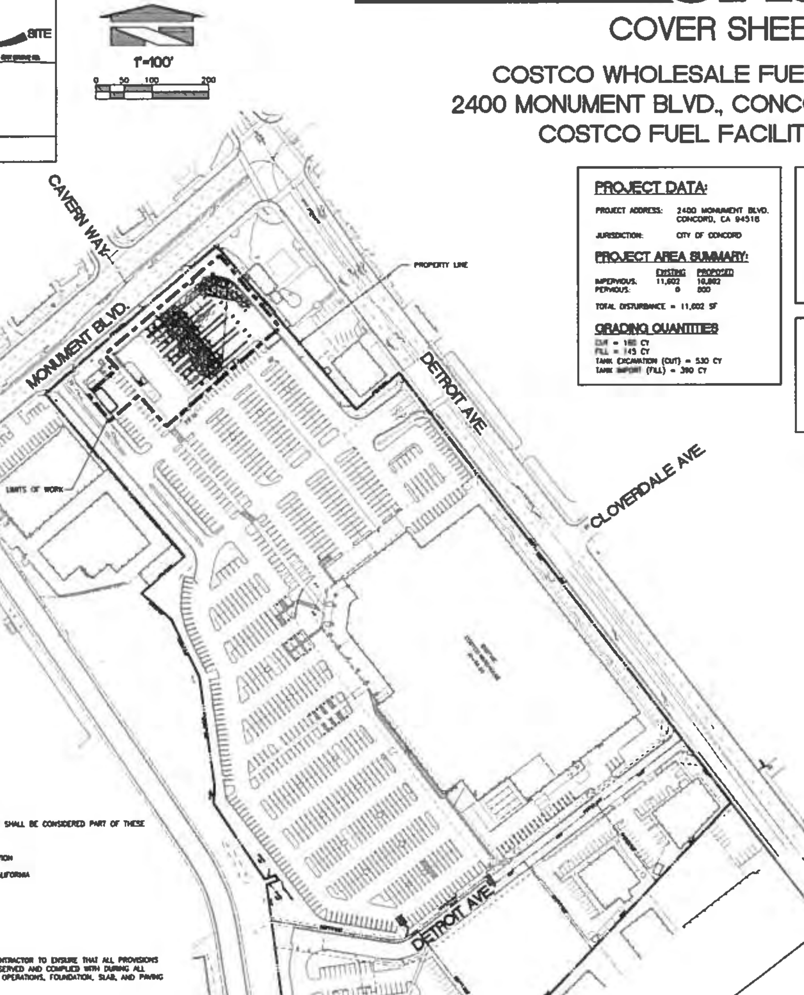
MAY 4, 2015



COSTCOGASOLINE

COVER SHEET

COSTCO WHOLESALE FUEL FACILITY
2400 MONUMENT BLVD., CONCORD, CA 94518
COSTCO FUEL FACILITY #663



PROJECT DATA:

PROJECT ADDRESS: 2400 MONUMENT BLVD. CONCORD, CA 94518

JURISDICTION: CITY OF CONCORD

PROJECT AREA SUMMARY:

	EXISTING	PROPOSED
IMPERVIOUS:	11,602	10,802
PERVIOUS:	0	800

TOTAL DISTURBANCE = 11,602 SF

GRADING QUANTITIES

CUT = 180 CY
FILL = 145 CY
TANK EXCAVATION (CUT) = 530 CY
TANK IMPORT (FILL) = 390 CY

CIVIL SHEET INDEX:

C1	COVER SHEET
C2	DEMOLITION AND EROSION CONTROL PLAN
C3	CIVIL SITE AND HORIZONTAL CONTROL PLAN
C4	GRADING AND UTILITY PLAN
C5	CONSTRUCTION NOTES AND DETAILS
C6	CONSTRUCTION NOTES AND DETAILS

LANDSCAPE INDEX:

L1	LANDSCAPE PLANTING PLANS
L2	LANDSCAPE PLANTING NOTES AND DETAILS
L3	LANDSCAPE IRRIGATION PLANS
L4	LANDSCAPE IRRIGATION NOTES AND DETAILS

PROJECT TEAM:

OWNER
COSTCO WHOLESALE
999 LAKE DRIVE
ISSAQUAH, WA 98027

CIVIL ENGINEER
BARGHAUSEN CONSULTING ENGINEERS, INC.
18215 72ND AVE. S.
KENT, WA 98032
PHONE: (425) 251-6222
FAX: (425) 251-8782
CONTACT: CHRIS M. TEBALDI, P.E.

ARCHITECT
MULVANNY G2 ARCHITECTURE
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BELLEVUE, WA 98004
PHONE: (425) 463-2000
FAX: (425) 463-2002

GEOTECHNICAL ENGINEER
KLEINFELDER
2 ADA, SUITE 250
IRVINE, CA 92618
PHONE: (949) 727-4466
FAX: (949) 727-9242

TRAFFIC ENGINEER
KITTELSON & ASSOCIATES, INC.
101 S. CAPITOL BLVD, BOISE, ID 83702
PHONE: (208) 338-2683
FAX: (208) 338-2685
CONTACT: SONIA HENNUM DALEIDEN, PTOE

LANDSCAPE DESIGNER
BARGHAUSEN CONSULTING ENGINEERS, INC.
18215 72ND AVE. S.
KENT, WA 98032
PHONE: (425) 251-6222
FAX: (425) 251-8782
CONTACT: ART SEIDEL

SURVEYOR
KIER & WRIGHT CIVIL ENGINEERS AND SURVEYORS, INC.
2850 COLLIER CANYON ROAD
LIVERMORE, CA 94551
PHONE: (925) 245-8788
FAX: (925) 254-8796

GENERAL SITE DEVELOPMENT NOTES:

1. THE CONTRACTOR SHALL OBTAIN AND HAVE AVAILABLE COPIES OF THE APPLICABLE GOVERNING AGENCY STANDARDS AT THE JOB SITE DURING THE RELATED CONSTRUCTION OPERATIONS.
2. CONTRACTOR SHALL ASSURE THAT ALL NECESSARY PERMITS HAVE BEEN OBTAINED PRIOR TO COMMENCING WORK.
3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING THE LOCATION, DIMENSION AND DEPTH OF ALL EXISTING UTILITIES PRIOR TO CONSTRUCTION WHETHER SHOWN ON THESE PLANS OR NOT. UTILITIES OTHER THAN THOSE SHOWN MAY EXIST ON THIS SITE. ONLY THOSE UTILITIES WITH EVIDENCE OF THEIR INSTALLATION VISIBLE AT GROUND SURFACE OR SHOWN ON RECORD DRAWING PROVIDED BY OTHERS ARE SHOWN HEREON. EXISTING UNDERGROUND UTILITY LOCATIONS SHOWN ARE APPROXIMATE ONLY AND ARE SUBJECT TO A DEGREE OF UNKNOWN VARIATION. SOME UNDERGROUND LOCATIONS SHOWN HEREON MAY HAVE BEEN TAKEN FROM PUBLIC RECORDS. BARGHAUSEN CONSULTING ENGINEERS, INC. ASSUMES NO LIABILITY FOR THE ACCURACY OF PUBLIC RECORDS OR RECORDS OF OTHERS. IF CONFLICTS SHOULD OCCUR, THE CONTRACTOR SHALL CONSULT BARGHAUSEN CONSULTING ENGINEERS, INC., TO RESOLVE ALL PROBLEMS PRIOR TO PROCEEDING WITH CONSTRUCTION.
4. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO REVIEW ALL OF THE DRAWINGS AND SPECIFICATIONS ASSOCIATED WITH THE PROJECT WORK SCOPE PRIOR TO THE INITIATION OF CONSTRUCTION. SHOULD THE CONTRACTOR FIND A CONFLICT WITH THE DOCUMENTS RELATIVE TO THE SPECIFICATIONS OR THE RELATIVE CODES, IT IS THE CONTRACTOR'S RESPONSIBILITY TO NOTIFY THE PROJECT ENGINEER OF RECORD IN WRITING PRIOR TO THE START OF CONSTRUCTION. FAILURE BY THE CONTRACTOR TO NOTIFY THE PROJECT ENGINEER SHALL CONSTITUTE ACCEPTANCE OF FULL RESPONSIBILITY BY THE CONTRACTOR TO COMPLETE THE SCOPE OF WORK AS DEFINED BY THE DRAWINGS AND IN FULL COMPLIANCE WITH LOCAL REGULATIONS AND CODES.
5. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO NOTIFY THE APPROPRIATE UTILITIES INVOLVED PRIOR TO CONSTRUCTION.
6. INSPECTION OF SITE WORK WILL BE ACCOMPLISHED BY A REPRESENTATIVE OF THE AUTHORITY HAVING JURISDICTION. INSPECTION OF PRIVATE FACILITIES WILL BE ACCOMPLISHED BY A REPRESENTATIVE OF THE OWNER. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO NOTIFY THE INSPECTOR OF THE AUTHORITY HAVING JURISDICTION 24 HOURS IN ADVANCE OF BACKFILLING ALL CONSTRUCTION OR AS REQUIRED BY THE AUTHORITY HAVING JURISDICTION.
7. PRIOR TO ANY CONSTRUCTION OR DEVELOPMENT ACTIVITY THE CONTRACTOR SHALL CONTACT THE AGENCY AND/OR UTILITY INSPECTION PERSONNEL AND ARRANGE ANY REQUIRED PRE-CONSTRUCTION MEETING(S). CONTRACTOR SHALL PROVIDE 72 HRS MIN. ADVANCE NOTIFICATION TO OWNER, FIELD ENGINEER AND ENGINEER OF PRE-CONSTRUCTION MEETINGS.
8. THE CONTRACTOR IS RESPONSIBLE FOR WORKER AND SITE SAFETY AND SHALL COMPLY WITH THE LATEST OSHA STANDARDS AND REGULATIONS, OR ANY OTHER AGENCY HAVING JURISDICTION FOR EXCAVATION AND TRENCHING PROCEDURES. THE CONTRACTOR IS RESPONSIBLE FOR DETERMINING THE "MEANS AND METHODS" REQUIRED TO MEET THE INTENT AND PERFORMANCE CRITERIA OF OSHA, AS WELL AS ANY OTHER ENTITY THAT HAS JURISDICTION FOR EXCAVATION AND/OR TRENCHING PROCEDURES.
9. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING ADEQUATE SAFEGUARDS, SAFETY DEVICES, PROTECTIVE EQUIPMENT, FLAGGERS, AND ANY OTHER NEEDED ACTIONS TO PROTECT THE LIFE, HEALTH, AND SAFETY OF THE PUBLIC, AND TO PROTECT PROPERTY IN CONNECTION WITH THE PERFORMANCE OF WORK COVERED BY THE CONTRACTOR. ANY WORK WITHIN THE TRAVELED RIGHT-OF-WAY THAT MAY INTERRUPT NORMAL TRAFFIC FLOW SHALL REQUIRE AT LEAST ONE FLAGGER FOR EACH LANE OF TRAFFIC AFFECTED.
10. PROTECTIVE MEASURES SHALL BE TAKEN BY THE CONTRACTOR TO PROTECT ALL ADJACENT PUBLIC AND PRIVATE PROPERTIES AT ALL TIMES DURING CONSTRUCTION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTION OF ALL EXISTING UTILITY SERVICES THAT ARE TO REMAIN OPERATIONAL WITHIN THE CONSTRUCTION AREA WHETHER SHOWN OR NOT SHOWN ON THE PLANS.
11. STRUCTURAL BMPs MUST BE ACCESSIBLE FOR INSPECTION BY THE AUTHORITY HAVING JURISDICTION DURING REGULAR BUSINESS HOURS.
12. TWO (2) COPIES OF THESE APPROVED PLANS MUST BE ON THE JOB SITE WHENEVER CONSTRUCTION IS IN PROGRESS. ONE (1) SET WITH RECORDS OF AS-BUILT INFORMATION SHALL BE SUBMITTED TO BARGHAUSEN CONSULTING ENGINEERS, INC. AT COMPLETION OF PROJECT

LEGAL DESCRIPTION:

(PER FIRST AMERICAN TITLE INSURANCE COMPANY'S TITLE INSURANCE COMMITMENT, THEIR ORDER NO. NCS-CWP-663-RA1 DATED JUNE 13, 2013 AT 7:30 A.M.)

PARCEL ONE.

ALL OF LOTS 18 THROUGH 22 INCLUSIVE AND PORTIONS OF LOTS 12 THROUGH 15, INCLUSIVE, PORTIONS OF LOT 23, PORTIONS OF LOTS 43 THROUGH 50, INCLUSIVE, AND PORTIONS OF WALNUT AVENUE, AS SHOWN ON THE MAP OF CLOVER DALE TRACT, FILED JUNE 26, 1912 IN MAP BOOK 7 AT PAGE 166, OFFICIAL RECORDS OF CONTRA COSTA COUNTY, AND AS CONVEYED PURSUANT TO THE CERTIFICATE OF COMPLIANCE OF LOT LINE ADJUSTMENT BY THE CITY OF CONCORD RECORDED FEBRUARY 22, 2000, SERIES NO. 2000034279 IN THE DEED TO COSTCO WHOLESALE CORPORATION, A WASHINGTON CORPORATION DATED FEBRUARY 9, 2000 AND RECORDED FEBRUARY 24, 2000, SERIES NO. 2000-36444, CONTRA COSTA COUNTY RECORDS, MORE PARTICULARLY DESCRIBED AS FOLLOWS:

COMMENCING AT THE POINT OF INTERSECTION OF THE SOUTHERLY LINE OF SAID LOT 43 WITH THE SOUTHWESTERLY LINE OF THAT CERTAIN PARCEL OF LAND GRANTED TO CONTRA COSTA COUNTY IN THE GRANT DEED RECORDED JANUARY 12, 1962 IN BOOK 4034 AT PAGE 339, OFFICIAL RECORDS OF CONTRA COSTA COUNTY;

THENCE FROM SAID POINT OF COMMENCEMENT ALONG SAID SOUTHWESTERLY LINE, NORTH 37° 33' 14" WEST 141.16 FEET TO THE ACTUAL POINT OF BEGINNING OF THIS DESCRIPTION;

THENCE FROM SAID POINT OF BEGINNING AND LEAVING SAID SOUTHWESTERLY LINE SOUTH 52° 26' 46" WEST, 416.67 FEET;
THENCE NORTH 37° 33' 14" WEST, 20.00 FEET;

THENCE SOUTH 52° 26' 46" WEST, 175.44 FEET;

THENCE WESTERLY ALONG THE ARC OF A 45.00 FOOT RADIUS TANGENT CURVE TO THE LEFT, THROUGH A CENTRAL ANGLE OF 46° 54' 53" AN ARC DISTANCE OF 36.85 FEET;

THENCE NORTH 80° 38' 21" WEST, 213.32 FEET TO A POINT ON THE EASTERLY LINE OF THAT CERTAIN PARCEL OF LAND DESCRIBED IN THE DEED TO PACIFIC GAS AND ELECTRIC COMPANY, A CALIFORNIA CORPORATION, RECORDED APRIL 30, 1968, BOOK 5613, PAGE 423, OFFICIAL RECORDS, AND RE-RECORDED AUGUST 12, 1968, BOOK 5688, PAGE 157, OFFICIAL RECORDS;

THENCE ALONG SAID EASTERLY LINE THE FOLLOWING FIVE (5) COURSES AND DISTANCES:

1. NORTH 7° 34' 11" WEST, 64.05 FEET;
2. NORTH 63° 18' 49" EAST, 20.50 FEET;
3. NORTH 30° 41' 11" WEST, 18.00 FEET;
4. SOUTH 69° 18' 49" WEST, 20.50 FEET;
5. NORTH 33° 48' 41" WEST, 182.36 FEET TO THE NORTHEAST CORNER OF SAID PACIFIC GAS AND ELECTRIC COMPANY PARCEL.

THENCE LEAVING SAID EASTERLY LINE ALONG THE WESTERLY LINE OF THE AFORESAID MAP OF CLOVER DALE TRACT, LOT 18, THE FOLLOWING FOUR (4) COURSES AND DISTANCES:

1. NORTH 4° 03' 11" EAST, 28.07 FEET,
2. NORTH 7° 56' 49" WEST, 196.82 FEET;
3. NORTH 25° 56' 49" WEST, 113.52 FEET;
4. NORTH 48° 11' 46" WEST, 70.74 FEET TO THE NORTHWEST CORNER THEREOF;

THENCE LEAVING SAID WESTERLY LINE ALONG THE NORTHERLY LINE OF SAID LOT 18, NORTH 49° 34' 15" EAST, 180.27 FEET TO THE NORTHEAST CORNER THEREOF;

THENCE LEAVING SAID NORTHERLY LINE ALONG THE WESTERLY LINE OF THE AFOREMENTIONED LOT 15, MAP OF CLOVER DALE TRACT NORTH 40° 27' 24" WEST, 380.27 FEET TO A POINT ON THE SOUTHEASTERLY LINE OF THAT CERTAIN PARCEL OF LAND DESCRIBED IN THE DEED TO THE CITY OF CONCORD, RECORDED MAY 11, 1970, BOOK 6125, PAGE 411, OFFICIAL RECORDS, SAID LINE NOW BEING THE SOUTHEASTERLY LINE OF MONUMENT BOULEVARD, A PUBLIC STREET 100 FEET WIDE;

THENCE ALONG SAID LINE NORTH 49° 33' 11" EAST, 400.00 FEET TO A POINT ON THE EASTERLY LINE OF THE AFOREMENTIONED LOT 12;

THENCE ALONG SAID EASTERLY LINE SOUTH 40° 27' 24" EAST, 380.39 FEET TO THE SOUTHEAST CORNER OF SAID LOT 12, SAID CORNER BEING COMMON TO SAID LOTS 12, 22 AND 23 OF SAID MAP

THENCE FROM SAID COMMON CORNER, ALONG THE NORTHWESTERLY LINE OF SAID LOT 23 NORTH 49° 34' 13" EAST, 100.00 FEET TO THE NORTHEAST CORNER THEREOF;

THENCE LEAVING SAID NORTHWESTERLY LINE ALONG THE AFOREMENTIONED SOUTHWESTERLY LINE OF SAID PARCEL OF LAND GRANTED TO CONTRA COSTA COUNTY (BOOK 4034 AT PAGE 339), SOUTH 37° 33' 14" EAST, 810.83 FEET TO THE ACTUAL POINT OF BEGINNING.

NOW KNOWN AS PARCEL 1, AS SHOWN ON THE ABOVE REFERENCED CERTIFICATE OF COMPLIANCE FOR LOT LINE ADJUSTMENT

PARCEL TWO:

EASEMENTS AS CONTAINED IN THE DECLARATION OF EASEMENTS EXECUTED BY COSTCO WHOLESALE CORPORATION, A WASHINGTON CORPORATION, DATED OCTOBER 2, 2000 AND RECORDED OCTOBER 13, 2000 UNDER RECORDERS SERIAL NO. 2000-228182, OFFICIAL RECORDS OF CONTRA COSTA COUNTY, CALIFORNIA

APN: 129-040-010-8

SOILS REPORT NOTES:

1. THE FOLLOWING SOILS REPORT FOR THE SITE SHALL BE CONSIDERED PART OF THESE CONSTRUCTION DOCUMENTS.

   GEOTECHNICAL UPDATE
   PROPOSED COSTCO GASOLINE FACILITY ADDITION
   COSTCO WHOLESALE WAREHOUSE NO. 663
   2400 MONUMENT BOULEVARD, CONCORD, CALIFORNIA
   DATED MAY 14, 2014

   SOIL INVESTIGATION AS PERFORMED BY:

   KLEINFELDER, INC.
   2 ADA, SUITE 250
   IRVINE, CA 92618
   PHONE: (949) 727-4466

2. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO ENSURE THAT ALL PROVISIONS OF THE SOILS REPORT FOR THE SITE BE OBSERVED AND COMPLIED WITH DURING ALL PHASES OF THE SITE PREPARATION, GRADING OPERATIONS, FOUNDATION, SLAB, AND PAVING CONSTRUCTION.
3. ANY PROVISIONS OF THE SOILS REPORT WHICH CONFLICT WITH INFORMATION SHOWN ELSEWHERE ON THESE DRAWINGS, OR WHICH REQUIRE FURTHER CLARIFICATION, SHALL BE BROUGHT TO THE ATTENTION OF BARGHAUSEN CONSULTING ENGINEERS, INC.
4. A REPRESENTATIVE OF THE SOILS ENGINEER SHALL BE AVAILABLE TO OBSERVE AND APPROVE THE EARTHWORK OPERATIONS AND TO VERIFY FIELD CONDITIONS AS WORK PROCEEDS. THE SOILS ENGINEER SHALL SUBMIT FIELD REPORTS DOCUMENTING THAT THE METHODS AND MATERIALS OF THE EARTHWORK OPERATIONS WERE IN ACCORDANCE WITH THE RECOMMENDATION OF THE SOILS INVESTIGATION AND THAT THE WORK WAS PERFORMED TO THE SATISFACTION OF THE ENGINEER. THE CONTRACTOR SHALL MAKE ALL PROVISIONS FOR SOILS INSPECTIONS AS RECOMMENDED WITHIN THE SOILS REPORT. AT A MINIMUM, THIS INCLUDES THE OBSERVATION OF THE FOLLOWING BY A SOILS ENGINEER:

   A. OVER-EXCAVATION RECOMMENDATIONS

   B. PLACEMENT OF STRUCTURAL FILL MATERIAL BENEATH PAVEMENT

   C. SUBGRADE PREPARATION OF CANOPY FOOTINGS

5. THE CONTRACTOR SHALL QUALIFY ANY LIMITATIONS TO SOILS INSPECTIONS WITHIN BID PROPOSAL.

BENCHMARK:

DESCRIPTION: FINISH FLOOR ELEVATION AT ENTRANCE
ELEVATION: 54.00

811 Know what's below. Call before you dig. Dial 811 Or Call 1-800-227-2600

UTILITY CONFLICT NOTE:

THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING THE LOCATION, DIMENSION, AND DEPTH OF ALL EXISTING UTILITIES WHETHER SHOWN ON THESE PLANS OR NOT BY POTHOLING THE UTILITIES AND SURVEYING THE HORIZONTAL AND VERTICAL LOCATION PRIOR TO CONSTRUCTION. THIS SHALL INCLUDE CALLING UTILITY LOCATE @ 1-800-227-2600 AND THEN POTHOLING ALL OF THE EXISTING UTILITIES AT LOCATIONS OF NEW UTILITY CROSSINGS TO PHYSICALLY VERIFY WHETHER OR NOT CONFLICTS EXIST. LOCATIONS OF SAID UTILITIES AS SHOWN ON THESE PLANS ARE BASED UPON THE UNVERIFIED PUBLIC INFORMATION AND ARE SUBJECT TO VARIATION. IF CONFLICTS SHOULD OCCUR, THE CONTRACTOR SHALL CONSULT BARGHAUSEN CONSULTING ENGINEERS, INC. TO RESOLVE ALL PROBLEMS PRIOR TO PROCEEDING WITH CONSTRUCTION.

CAUTION

POTENTIAL UTILITY CONFLICT. CONTRACTOR SHALL FIELD VERIFY ALL EXISTING AND NEW UTILITIES PRIOR TO CONSTRUCTION. SEE UTILITY CONFLICT NOTE. THE EXISTING WATER, STORM, AND SANITARY SEWER SERVICE SHOWN IS APPROXIMATE, BASED ON FIELD SURVEYS AND "AS-BUILT" RECORDS. THE GENERAL CONTRACTOR SHALL "POTHOLE" THE EXISTING UTILITIES TO VERIFY THE DIAMETER AND LOCATION (INCL. ELEVATIONS) PRIOR TO CONSTRUCTION. ANY DISCREPANCIES IN THE LOCATION OF THE EXISTING PIPE OR INCOMPATIBILITY OF THE DESIGN SHALL BE BROUGHT TO THE IMMEDIATE ATTENTION OF THE OWNERS REPRESENTATIVE, AND BARGHAUSEN CONSULTING ENGINEERS (425-251-6222).

No.	Date	By	Ckd	Appr	Revision
4	5/06/15	JD	CMT	HPG	LAND USE SUBMITTAL
3	3/20/15	JD	CMT	HPG	PERMIT RESUBMITTAL

Title: COVER SHEET
2400 MONUMENT BOULEVARD
CONCORD, CA 94518
COSTCO FUEL FACILITY #663

For: COSTCOGASOLINE
COSTCO WHOLESALE
999 LAKE DRIVE
ISSAQUAH, WA 98027

LICENSED PROFESSIONAL ENGINEER
HAL P. GRUBB
67814
CIVIL
STATE OF CALIFORNIA

Scale: Horizontal 1"=100' Vertical N/A

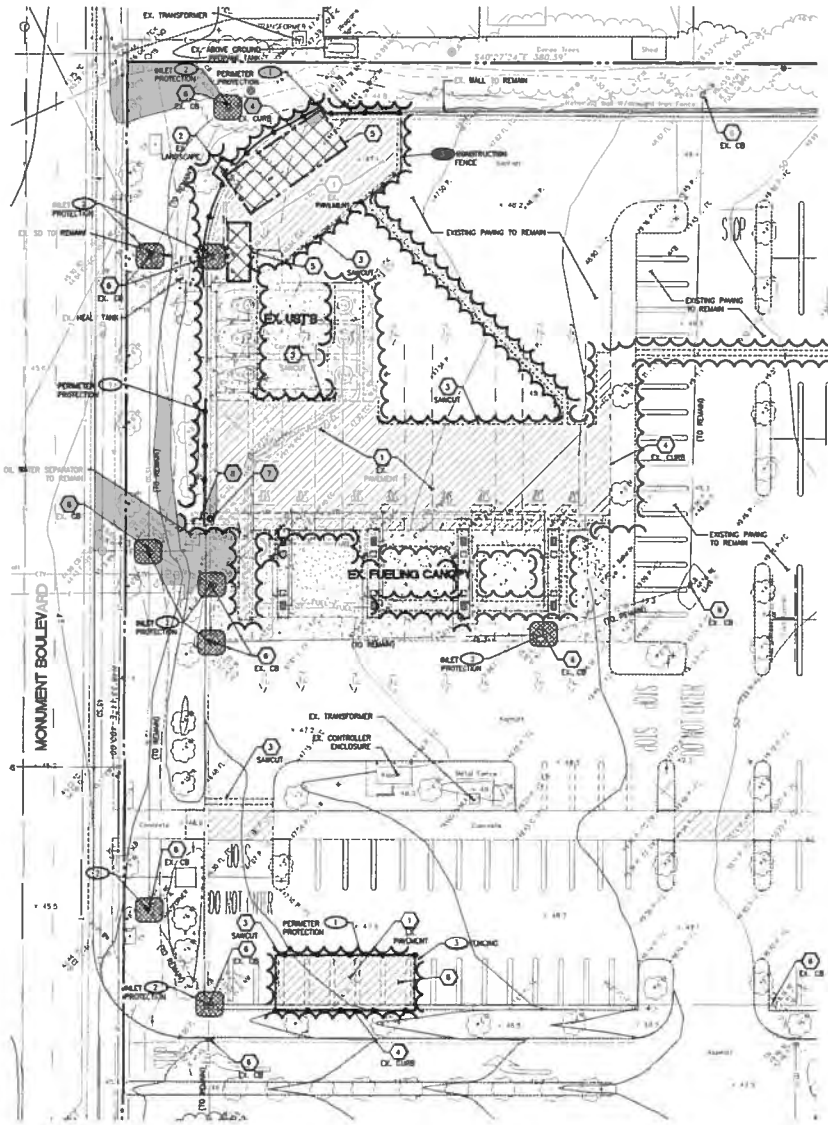
Designed JD
Drawn JD
Checked CMT
Approved HPG
Date 12/18/14

BARGHAUSEN CONSULTING ENGINEERS, INC.
18215 72ND AVENUE SOUTH
KENT, WA 98032
(425)251-6222
(425)251-8782 FAX
CIVIL ENGINEERING, LAND PLANNING, SURVEYING, ENVIRONMENTAL SERVICES

Job Number 7340
Sheet C1 of 6

DEMOLITION AND EROSION CONTROL PLAN

COSTCO WHOLESALE FUEL FACILITY EXPANSION
2400 MONUMENT BOULEVARD, CONCORD, CA 94518
COSTCO FACILITY #663



LEGEND

- EXISTING ASPHALT
- EXISTING CONCRETE
- EXISTING CURB
- EXISTING CURB LIP
- EXISTING CANOPY DRIPLINE
- EXISTING EDGE OF PAVEMENT
- EXISTING STORM DRAIN
- EXISTING UNDERGROUND WATER LINE
- EXISTING UNDERGROUND TELEPHONE LINE
- EXISTING UNDERGROUND POWER
- EXISTING STORM DRAIN CATCH BASIN
- EXISTING STORM CLEANOUT
- EXISTING SPOT ELEVATION
- EXISTING PAVEMENT TO BE DEMOLISHED
- LIMITS OF PLANNED U.S.T. AREA
- STORM DRAIN INLET PROTECTION
- PROPERTY LINE
- SAW CUT LINE
- PERIMETER PROTECTION
- LIMITS OF DISTURBANCE
- CONSTRUCTION FENCE

DEMOLITION CALLOUTS

1. EXISTING ASPHALT PAVEMENT/CONCRETE TO BE DEMOLISHED AND DISPOSED OF OFFSITE.
2. DEMOLISH EXISTING LANDSCAPE AND IRRIGATION AS NECESSARY FOR PROPOSED CONSTRUCTION. SEE LANDSCAPE AND IRRIGATION PLANS FOR DETAILS.
3. SAWCUT LINE. CONTRACTOR TO PROVIDE A SMOOTH, CLEAN EDGE FOR MATCHING INTO EXISTING PAVEMENT.
4. EXISTING CONCRETE CURB TO BE DEMOLISHED AND DISPOSED OF OFFSITE.
5. APPROXIMATE LIMITS OF PLANNED U.S.T AREA. PROVIDE TEMPORARY TANK HOLE SHORING AS NECESSARY PER SOILS ENGINEER RECOMMENDATIONS AND PER OSHA STANDARDS.
6. EXISTING CATCH BASIN TO REMAIN.
7. EXISTING CATCH BASIN TO BE REMOVED AND REPLACED WITH NEW CATCH BASIN. SEE SHEET C4.
8. EXISTING 6" STORM DRAIN TO BE DEMOLISHED.
9. EXCAVATION FOR PROPOSED BIORETENTION AREA. SEE DETAIL SHEET C5 FOR APPROXIMATE DEPTH OF EXCAVATION.

DEMOLITION NOTES:

1. ALL PAVEMENTS, SLABS, GROUND COVER, UTILITIES, ETC., INSIDE DEMOLITION LIMITS SHALL BE REMOVED UNLESS OTHERWISE SHOWN ON THE PLANS.
2. CONTRACTOR SHALL CONTACT AND COORDINATE WITH THE VARIOUS UTILITY COMPANIES ON REQUESTING DISCONNECTIONS, REMOVALS AND/OR RELOCATION OF EXISTING SERVICE.
3. CONTRACTOR SHALL ASSURE THAT ALL NECESSARY PERMITS AND CONSTRUCTION APPROVALS HAVE BEEN OBTAINED PRIOR TO COMMENCING WORK.
4. CONTRACTOR SHALL REPLACE ALL EXISTING CURB, PAVEMENT AND/OR LANDSCAPING DAMAGED AS A RESULT OF CONSTRUCTION ACTIVITY.
5. CONTRACTOR SHALL, PRIOR TO CONSTRUCTION OR REMOVAL OF IMPROVEMENTS, FIELD VERIFY AND CONFIRM LIMITS OF DEMOLITION AS WELL AS EXISTING UTILITIES AND IMPROVEMENTS TO REMAIN.

EROSION/SEDIMENT CONTROL CALLOUTS:

1. CONTRACTOR TO INSTALL SANDBAG BARRIERS, STRAW BALE BARRIERS, SILT FENCE OR OTHER APPROVED PERIMETER PROTECTION AT ALL PERIMETER LOCATIONS OF PROJECT SITE AS REQUIRED TO PREVENT SILT-LADEN RUNOFF FROM LEAVING SITE, AND AS DIRECTED BY INSPECTOR OF AUTHORITY HAVING JURISDICTION. SEE DETAILS ON SHEET C6.
2. AT DOWNSTREAM RECEIVING STORM INLET – CONTRACTOR TO INSTALL STORM DRAIN INLET PROTECTION AT ALL AREA INLET LOCATIONS AS REQUIRED TO PREVENT SILT-LADEN WATER FROM ENTERING STORM DRAINAGE SYSTEM, AND AS DIRECTED BY INSPECTOR OF AUTHORITY HAVING JURISDICTION. SEE DETAILS ON SHEET C6.
3. TEMPORARY CONSTRUCTION FENCING – CONTRACTOR TO INSTALL 6-FOOT HIGH CHAIN LINK FENCING ALONG PERIMETER OF CONSTRUCTION SITE AS INDICATED ON APPROVED PLANS, AND AS DIRECTED BY COSTCO WAREHOUSE MANAGER, OWNER'S CPM AND AUTHORITY HAVING JURISDICTION.

DUST CONTROL NOTES:

1. WATER ALL ACTIVE CONSTRUCTION AREAS AT LEAST TWICE DAILY.
2. WATER OR COVER STOCKPILES OF DEBRIS, SOIL, SAND OR OTHER MATERIALS THAT CAN BE BLOWN BY THE WIND.
3. COVER ALL TRUCKS HAULING SOIL, SAND, AND OTHER LOOSE MATERIALS OR REQUIRE ALL TRUCKS TO MAINTAIN AT LEAST TWO FEET OF FREEBOARD.
4. SWEEP DAILY (PREFERABLY WITH WATER SWEEPERS) ALL PAVED ACCESS ROADS, PARKING AREAS AND STAGING AREAS AT CONSTRUCTION SITES.
5. SWEEP STREETS DAILY (PREFERABLY WITH WATER SWEEPERS) IF VISIBLE SOIL MATERIAL IS CARRIED OVTO ADJACENT PUBLIC STREETS.

STAGING AREA NOTE:

1. CONTRACTOR TO COORDINATE WITH ARCHITECT, COSTCO CONSTRUCTION PROJECT MANAGER AND WAREHOUSE MANAGER TO DETERMINE APPROPRIATE STAGING AREA. STAGING AREA TO COMPLY WITH COSTCO PROPERTY MANAGEMENT STAGING REQUIREMENTS.

EROSION CONTROL NOTES:

1. ALL NECESSARY EQUIPMENT AND MATERIALS SHALL BE AVAILABLE ON SITE TO FACILITATE RAPID INSTALLATION OF EROSION AND SEDIMENT CONTROL BMPS WHEN RAIN IS IMMINENT.
2. THE CONTRACTOR SHALL RESTORE ALL EROSION CONTROL DEVICES TO WORKING ORDER TO THE SATISFACTION OF THE AUTHORITY HAVING JURISDICTION AFTER EACH RUN-OFF PRODUCING RAINFALL.
3. THE CONTRACTOR SHALL INSTALL ADDITIONAL EROSION CONTROL MEASURES AS MAY BE REQUIRED BY THE AUTHORITY HAVING JURISDICTION DUE TO UNCOMPLETED GRADING OPERATIONS OR UNFORESEEN CIRCUMSTANCES WHICH MAY ARISE.
4. ADEQUATE EROSION AND SEDIMENT CONTROL AND PERIMETER PROTECTION BEST MANAGEMENT PRACTICE MEASURES MUST BE INSTALLED AND MAINTAINED.

CONSTRUCTION SEQUENCE:

1. SCHEDULE AND ATTEND PRE-CONSTRUCTION CONFERENCE WITH THE AUTHORITY HAVING JURISDICTION, IF REQUIRED.
2. FLAG OR FENCE CLEARING LIMITS/LIMITS OF DISTURBANCE AS INDICATED ON THE APPROVED PLANS.
3. INSTALL CATCH BASIN PROTECTION AS INDICATED ON THE APPROVED PLANS.
4. INSTALL SILT FENCE/PERIMETER PROTECTION AS INDICATED ON THE APPROVED PLANS.
5. REMOVE EXISTING ASPHALT AND/OR CONCRETE PAVEMENT AND CURB AS INDICATED ON THE DEMOLITION PLAN.
6. INSTALL STORM DRAINAGE IMPROVEMENTS AS INDICATED ON THE APPROVED PLANS.
7. INSTALL UNDERGROUND STORAGE TANKS, FUELING CANOPY AND ASSOCIATED IMPROVEMENTS AS INDICATED ON THE APPROVED PLANS.
8. INSTALL SITE PAVING AND CONCRETE CURBING.
9. INSTALL SITE LANDSCAPING AND IRRIGATION AS INDICATED ON THE APPROVED PLANS.
10. EROSION CONTROL MEASURES TO BE MAINTAINED IN ACCORDANCE WITH THE APPLICABLE STANDARDS AND MANUFACTURERS RECOMMENDATIONS THROUGH THE DURATION OF THE SITE DEVELOPMENT
11. UPON COMPLETION OF THE PROJECT, ALL DISTURBED AREAS MUST BE STABILIZED AND BEST MANAGEMENT PRACTICES REMOVED IF APPROVED BY THE AUTHORITY HAVING JURISDICTION.

HAULING/SILTATION CONTROL NOTES:

1. PUBLIC STREETS ARE TO BE KEPT CLEAN OF DIRT AND DEBRIS GENERATED BY WORK. CLEANUP SHALL BE BY SWEEPING AND/OR OTHER APPROVED METHODS ON A DAILY BASIS.
2. CONTRACTOR SHALL PROVIDE SILT BAGS OR OTHER SILTATION CONTROL MEASURES ON EXISTING CATCH BASIN(S) IN PROXIMITY OF WORK WHICH HAVE POTENTIAL TO RECEIVE SURFACE RUNOFF FROM THE WORK AREA OR ANY LOCATIONS THAT MAY BE DESIGNATED BY THE AUTHORITY HAVING JURISDICTION DURING THE COURSE OF THE WORK.
3. EFFORTS SHALL BE MADE DURING CONSTRUCTION ACTIVITIES TO STABILIZE ALL DISTURBED AREAS AS QUICKLY AS POSSIBLE TO MINIMIZE EROSION
4. ITEMS FOR DEMOLITION ARE DEPICTED PER DESIGN DRAWINGS. CONTRACTOR TO VERIFY AND LOCATE ANY ITEMS FOR DEMOLITION PRIOR TO START OF CONSTRUCTION AND NOTIFY BARGHAUSEN CONSULTING ENGINEERS, INC. IMMEDIATELY OF ANY DISCREPANCIES.
5. CONTRACTOR TO REVIEW AS-BUILT DRAWINGS IN PROJECT AREA AND REMOVE AND/OR RELOCATE ANY SITE APPURTENANCES IN PROJECT AREA THAT IMPACT THE PROJECT.

TANK EXCAVATION NOTE:

1. TANK EXCAVATIONS SHALL BE PER OSHA REQUIREMENTS AND BE PERFORMED FOLLOWING THE RECOMMENDATIONS OF THE SOILS REPORT. TANK EXCAVATIONS THAT REQUIRE SHORING SHALL BE ENGINEERED AND PERMITTED SEPARATELY AND SHALL BE THE RESPONSIBILITY OF THE INSTALLING CONTRACTOR.

DEWATERING NOTE:

1. BASED UPON THE GEOTECHNICAL REPORT, DEWATERING OF THE TANK EXCAVATION MAY BE REQUIRED. THE GENERAL CONTRACTOR SHALL CONTACT THE AUTHORITY HAVING JURISDICTION OVER THIS PROJECT AND OBTAIN REQUIREMENTS FOR TREATMENT AND/OR DISCHARGE OF THE REMOVED GROUNDWATER.

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UTILITY CONFLICT NOTE:

THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING THE LOCATION, DIMENSION, AND DEPTH OF ALL EXISTING UTILITIES WHETHER SHOWN ON THESE PLANS OR NOT BY POTHOLING THE UTILITIES AND SURVEYING THE HORIZONTAL AND VERTICAL LOCATION PRIOR TO CONSTRUCTION. THIS SHALL INCLUDE CALLING UTILITY LOCATE @ 1-800-227-2600 AND THEN POTHOLING ALL OF THE EXISTING UTILITIES AT LOCATIONS OF NEW UTILITY CROSSINGS TO PHYSICALLY VERIFY WHETHER OR NOT CONFLICTS EXIST. LOCATIONS OF SAID UTILITIES AS SHOWN ON THESE PLANS ARE BASED UPON THE UNVERIFIED PUBLIC INFORMATION AND ARE SUBJECT TO VARIATION. IF CONFLICTS SHOULD OCCUR, THE CONTRACTOR SHALL CONSULT BARGHAUSEN CONSULTING ENGINEERS, INC. TO RESOLVE ALL PROBLEMS PRIOR TO PROCEEDING WITH CONSTRUCTION.

No.	Date	By	Ckd.	Description
3	5/06/15	JD	CJT	HPG LAND USE SUBMITTAL
2	3/26/15	JD	CJT	PERMIT RESUBMITTAL
1				

Title: DEMOLITION AND EROSION CONTROL PLAN
2400 MONUMENT BOULEVARD
CONCORD, CA 94518
COSTCO FUEL FACILITY #663

For: COSTCO GASOLINE
COSTCO WHOLESALE
999 LAKE DRIVE
ISSAQUAH, WA 98027

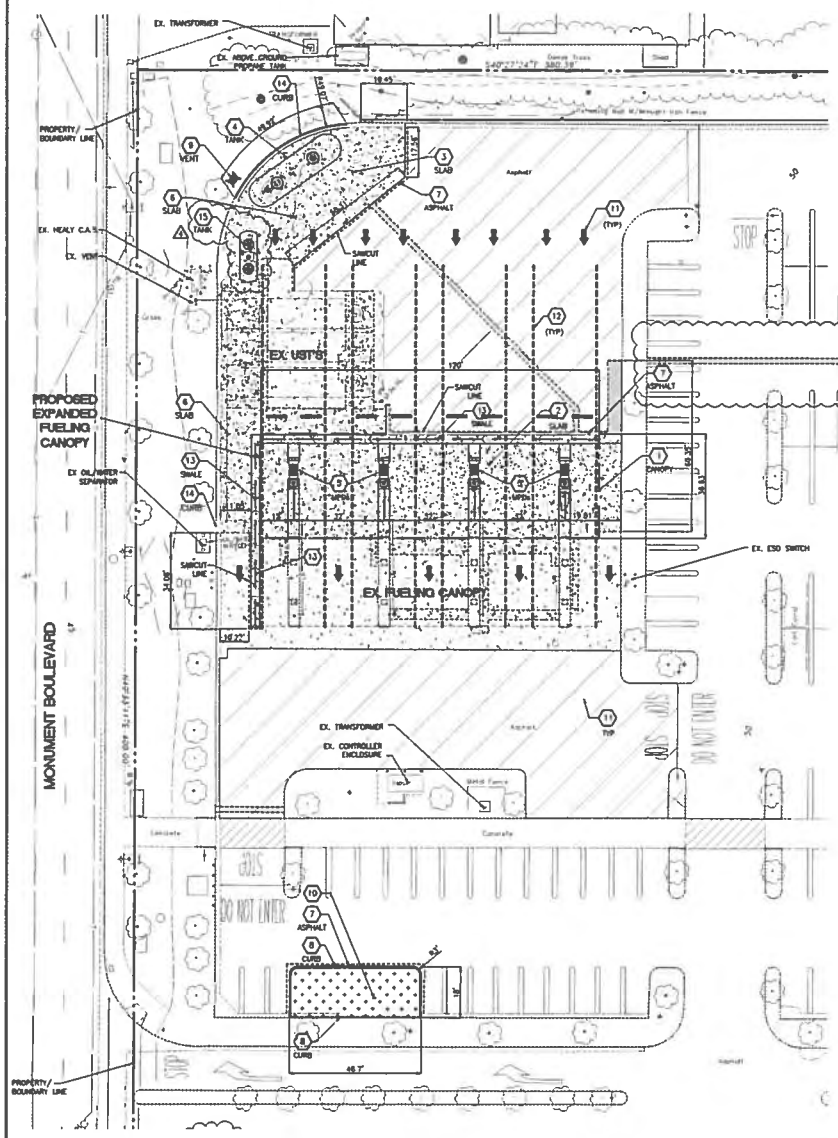
LICENSED PROFESSIONAL ENGINEER — HAL P. CRABB 67814 — CIVIL — STATE OF CALIFORNIA

BARGHAUSEN CONSULTING ENGINEERS, INC.
18215 72ND AVENUE SOUTH
KENT, WA 98032
(425)251-6222
(425)251-8782 FAX
CIVIL ENGINEERING, LAND PLANNING, SURVEYING, ENVIRONMENTAL SERVICES

Designed JD | Drawn JD | Checked JMC | Approved JMC | Date 12/18/14
Scale: Horizontal 1"=20' | Vertical N/A
Job Number 7340
Sheet C2.6
File: P:\07\07340\17340\engineering\2014 Costco Expansion\17340-1.dwg Date/time: 5/7/2015 1:58 PM Scale: 1" = 1 Layout: C2.6 Plotted by: ----

CIVIL SITE AND HORIZONTAL CONTROL PLAN

COSTCO WHOLESALE FUEL FACILITY EXPANSION
2400 MONUMENT BOULEVARD, CONCORD, CA 94518
COSTCO FACILITY #663



LEGEND

- EXISTING ASPHALT
- EXISTING CONCRETE
- EXISTING CURB
- EXISTING EASEMENT
- EXISTING EDGE OF PAVEMENT
- PROPOSED ASPHALT
- PROPOSED CONCRETE
- PROPOSED BIORETENTION AREA
- SLURRY SEAL
- PROPOSED CONCRETE BARRIER CURB
- PROPOSED CONCRETE CURB AND GUTTER
- SAWCUT LINE

SITE IMPROVEMENT SCHEDULE

1. PROPOSED 120'-0" x 36'-0" PUMP ISLAND CANOPY WITH 2 MULTI-PRODUCT DISPENSERS. SEE STRUCTURAL PLANS.
2. PROPOSED REINFORCED CONCRETE DRIVE SLAB BENEATH PUMP ISLAND CANOPY. SEE DETAIL ON SHEET C5.
3. PROPOSED REINFORCED CONCRETE DRIVE SLAB ABOVE UNDERGROUND STORAGE TANKS. SEE SLAB DETAIL ON TANK PLANS.
4. PROPOSED 20,000 GALLON UNDERGROUND DIESEL STORAGE TANK. SEE TANK PLANS.
5. NEW PUMP ISLAND MULTI-PRODUCT DISPENSER AND PUMP ISLAND PER DETAILS ON SHEET C5. SEE TANK AND ELECTRICAL PLANS FOR DISPENSER DETAILS.
6. PROPOSED HEAVY DUTY CONCRETE PAVEMENT.
7. PROPOSED HEAVY DUTY ASPHALT PAVEMENT. SEE ASPHALT PAVEMENT SECTION SHEET C5.
8. PROPOSED CONCRETE CURB FOR BIORETENTION POND. SEE DETAIL ON SHEET C6
9. PROPOSED VENTS. SEE TANK PLANS.
10. PROPOSED BIORETENTION AREA. SEE DESIGN CRITERIA ON SHEET C4, DETAIL ON SHEET C6.
11. PROPOSED ARROW PAVEMENT MARKING. SEE ARCHITECTURAL PLANS.
12. PROPOSED LANE PAVEMENT PAINT STRIPING. SEE ARCHITECTURAL PLANS.
13. PROPOSED 3' WIDE CEMENT CONCRETE SWALE. SEE SHEET C5 FOR DETAIL.
14. PROPOSED CONCRETE CURB AND GUTTER. SEE DETAIL ON SHEET C5.
15. PROPOSED 3,500 GALLON UNDERGROUND SPLIT ADDITIVE TANK. SEE TANK PLANS. △1

UTILITY CONFLICT NOTE

THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING THE LOCATION, DIMENSION, AND DEPTH OF ALL EXISTING UTILITIES WHETHER SHOWN ON THESE PLANS OR NOT BY POTHOLING THE UTILITIES AND SURVEYING THE HORIZONTAL AND VERTICAL LOCATION PRIOR TO CONSTRUCTION. THIS SHALL INCLUDE CALLING UTILITY LOCATE @ 1-800-277-2600 AND THEN POTHOLING ALL OF THE EXISTING UTILITIES AT LOCATIONS OF PROPOSED UTILITY CROSSINGS TO PHYSICALLY VERIFY WHETHER OR NOT CONFLICTS EXIST. LOCATIONS OF SAID UTILITIES AS SHOWN ON THESE PLANS ARE BASED UPON THE UNVERIFIED PUBLIC INFORMATION AND ARE SUBJECT TO VARIATION. IF CONFLICTS SHOULD OCCUR, THE CONTRACTOR SHALL CONSULT BARGHAUSEN CONSULTING ENGINEERS, INC. TO RESOLVE ALL PROBLEMS PRIOR TO PROCEEDING WITH CONSTRUCTION.

No.	Date	By	Chk	Appr.	Revision
1	5/28/15	JD	CMT	HPG	LAND USE SUBMITTAL
2	1/30/15	JD	CMT	HPG	PERMIT RESUBMITTAL

Title: CIVIL SITE AND HORIZONTAL CONTROL PLAN
2400 MONUMENT BOULEVARD
CONCORD, CA 94518
COSTCO FUEL FACILITY #663

For: COSTCO GASOLINE
COSTCO WHOLESALE
999 LAKE DRIVE
ISSAQUAH, WA 98027

LICENSED PROFESSIONAL ENGINEER
HAL P. GRUBB
67814
CIVIL
STATE OF CALIFORNIA

Scale: Horizontal 1"=20' Vertical N/A

Designed HG
Drawn HG
Checked CMT
Approved HPG
Date 12/18/14

BARGHAUSEN CONSULTING ENGINEERS, INC.
18215 72ND AVENUE SOUTH
KENT, WA 98032
(425)251-6222
(425)251-8782 FAX
CIVIL ENGINEERING, LAND PLANNING, SURVEYING, ENVIRONMENTAL SERVICES

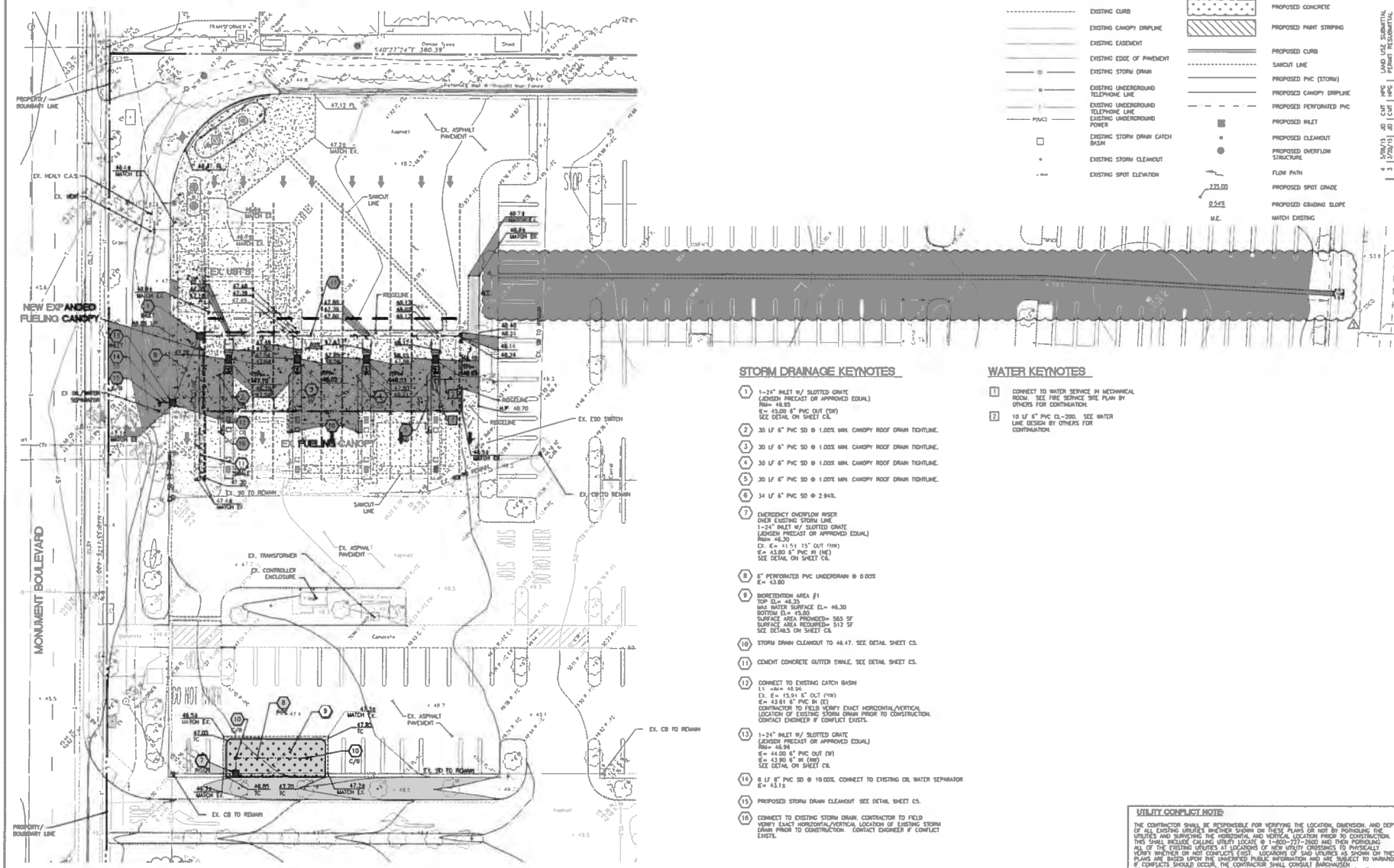
Job Number 7340

Sheet C3.6

File: P:\663\dwg\3-MD\engineering\2014 Costco Expansion\7340-a.dwg Date/time: 5/5/2015 11:28 AM Scale: 1" = 1' LTS:0.0 Tmpl: ----

GRADING AND UTILITY PLAN

COSTCO WHOLESALE FUEL FACILITY EXPANSION
2400 MONUMENT BOULEVARD, CONCORD, CA 94518
COSTCO FACILITY #663



LEGEND

EXISTING ASPHALT	PROPOSED ASPHALT
EXISTING CONCRETE	PROPOSED CONCRETE
EXISTING CURB	PROPOSED CONCRETE
EXISTING CANOPY DRIPLINE	PROPOSED PAINT STRIPING
EXISTING EASEMENT	PROPOSED CURB
EXISTING EDGE OF PAVEMENT	SAWCUT LINE
EXISTING STORM DRAIN	PROPOSED PVC (STORM)
EXISTING UNDERGROUND TELEPHONE LINE	PROPOSED CANOPY DRIPLINE
EXISTING UNDERGROUND TELEPHONE LINE	PROPOSED PERFORATED PVC
P(UC) EXISTING UNDERGROUND POWER	PROPOSED INLET
EXISTING STORM DRAIN CATCH BASIN	PROPOSED CLEANOUT
EXISTING STORM CLEANOUT	PROPOSED OVERFLOW STRUCTURE
EXISTING SPOT ELEVATION	FLOW PATH
	235.00 PROPOSED SPOT GRADE
	0.54% PROPOSED GRADING SLOPE
	M.E. MATCH EXISTING

STORM DRAINAGE KEYNOTES

1. 1-24" INLET W/ SLOTTED GRATE (JENSEN PRECAST OR APPROVED EQUAL) RIM= 46.95 IE= 43.00 6" PVC OUT (SW) SEE DETAIL ON SHEET C6.
2. 30 LF 6" PVC SD @ 1.00% MIN. CANOPY ROOF DRAIN TIGHTLINE.
3. 30 LF 6" PVC SD @ 1.00% MIN. CANOPY ROOF DRAIN TIGHTLINE.
4. 30 LF 6" PVC SD @ 1.00% MIN. CANOPY ROOF DRAIN TIGHTLINE.
5. 30 LF 6" PVC SD @ 1.00% MIN. CANOPY ROOF DRAIN TIGHTLINE.
6. 34 LF 6" PVC SD @ 2.94%.
7. EMERGENCY OVERFLOW RISER OVER EXISTING STORM LINE 1-24" INLET W/ SLOTTED GRATE (JENSEN PRECAST OR APPROVED EQUAL) RIM= 46.30 EX. IE= 41.51 15" OUT (NW) IE= 43.80 6" PVC IN (NE) SEE DETAIL ON SHEET C6.
8. 6" PERFORATED PVC UNDERDRAIN @ 0.00% IE= 43.80
9. BIORETENTION AREA #1 TOP EL= 46.35 MAX WATER SURFACE EL= 46.30 BOTTOM EL= 45.80 SURFACE AREA PROVIDED= 565 SF SURFACE AREA REQUIRED= 512 SF SEE DETAILS ON SHEET C6.
10. STORM DRAIN CLEANOUT TO 48.47. SEE DETAIL SHEET C5.
11. CEMENT CONCRETE GUTTER SWALE. SEE DETAIL SHEET C5.
12. CONNECT TO EXISTING CATCH BASIN EL= 48.94 EX. IE= 45.91 6" OUT (NW) IE= 43.81 6" PVC IN (E) CONTRACTOR TO FIELD VERIFY EXACT HORIZONTAL/VERTICAL LOCATION OF EXISTING STORM DRAIN PRIOR TO CONSTRUCTION. CONTACT ENGINEER IF CONFLICT EXISTS.
13. 1-24" INLET W/ SLOTTED GRATE (JENSEN PRECAST OR APPROVED EQUAL) RIM= 46.98 IE= 44.00 6" PVC OUT (W) IE= 43.90 6" IN (NW) SEE DETAIL ON SHEET C6.
14. 6 LF 6" PVC SD @ 10.00% CONNECT TO EXISTING OIL WATER SEPARATOR IE= 43.12
15. PROPOSED STORM DRAIN CLEANOUT SEE DETAIL SHEET C5.
16. CONNECT TO EXISTING STORM DRAIN. CONTRACTOR TO FIELD VERIFY EXACT HORIZONTAL/VERTICAL LOCATION OF EXISTING STORM DRAIN PRIOR TO CONSTRUCTION. CONTACT ENGINEER IF CONFLICT EXISTS.

WATER KEYNOTES

1. CONNECT TO WATER SERVICE IN MECHANICAL ROOM. SEE FIRE SERVICE SITE PLAN BY OTHERS FOR CONTINUATION.
2. 10 LF 6" PVC CL-200. SEE WATER LINE DESIGN BY OTHERS FOR CONTINUATION.

UTILITY CONFLICT NOTE:

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No.	Date	By	Chk	Description
1	1/29/13	JD	CMT	HPC LAND USE SUBMITTAL
2	3/05/13	JD	CMT	1st Draft RESUBMITTAL

Title: GRADING AND UTILITY PLAN 2400 MONUMENT BOULEVARD CONCORD, CA 94518 COSTCO FUEL FACILITY #663

For: COSTCO GASOLINE
COSTCO WHOLESALE
999 LAKE DRIVE
ISSAQUAH, WA 98027

LICENSED PROFESSIONAL ENGINEER — HAI P. CHUNG 67814 — CIVIL — STATE OF CALIFORNIA

Scale: Horizontal 1"=20' Vertical N/A

Designed JD Drawn JD Checked CMT Approved HPC Date 1/29/13

BARGHAUSEN CONSULTING ENGINEERS
18215 72ND AVENUE SOUTH
KENT, WA 98032
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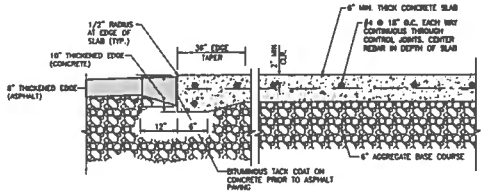
CIVIL ENGINEERING, LAND PLANNING, SURVEYING, ENVIRONMENTAL SERVICES

Job Number 7340

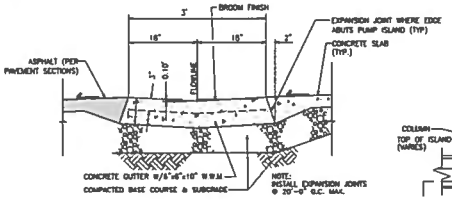
Sheet C4.6

File:P:\07063\7340\engineering\2014 Costco Expansion\7340-gr.dwg Date/Time:3/5/2013 1:13 PM Scale:1" = 1' 63/12865 Layt: ------

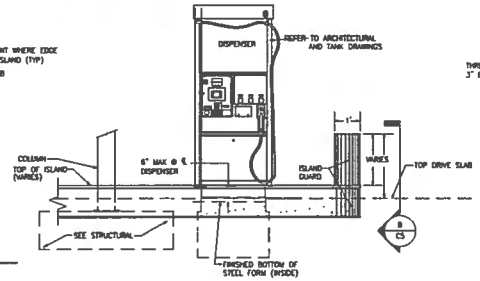
CONSTRUCTION NOTES AND DETAILS
COSTCO WHOLESALE FUEL FACILITY EXPANSION
2400 MONUMENT BOULEVARD, CONCORD, CA 94518
COSTCO FACILITY #663



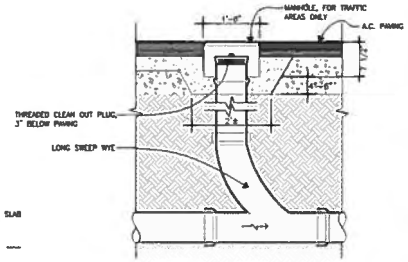
TYPICAL JOINT SECTION AT CONCRETE AND ASPHALT PAVEMENT
NOT TO SCALE



CEMENT CONCRETE SWALE
N.T.S.

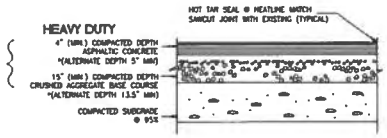


ISLAND ELEVATION
NOT TO SCALE



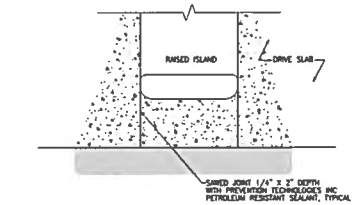
TYP. CLEANOUT BLOCKING DETAIL
NOT TO SCALE

NOTES
A. CLEAN OUT LOCATIONS INDICATED ON GRADING & UTILITY PLANS AS "CO"
B. PROVIDE CLEANOUTS AS SPECIFIED BELOW:
- ZURN Z-1400 CLEAN OUTS IN NON-TRAFFIC AREAS
- ZURN Z-1440 CLEAN OUTS IN LANDSCAPED AREAS
- ZURN Z-1400 HD CLEAN OUTS IN TRAFFIC AREAS WITH A "SERVICE STATION" TYPE MANHOLE, CPW #126A-9 - DOVER CORP./CPW DIV.

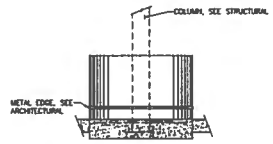


NOTES:
1. A.C. PAVEMENT SPECIFICATION SHALL BE APPROVED BY SOILS ENGINEER.
2. PREPARATION OF SUBGRADE SHALL BE PER PROCEDURES OUTLINED IN THE SOILS REPORT.
3. CONTRACTOR SHALL INCLUDE AS LUMP SUM FOR ASPHALT SURFACE SEAL COAT AT AN APPLICATION RATE OF 25 GALLONS PER 1000 SQ. FEET. SEAL COAT SHALL BE A "SLURRY" TYPE PER ASPHALT INSTITUTE. PRODUCT SHALL CONTAIN EITHER CSS-1 OR STE-1 EMULSIFIED ASPHALT. CONTRACTOR SHALL INCLUDE APPLICATION METHOD AND RATE, PRODUCT SUBMITTAL AND A UNIT PRICE BID.
CONTRACTOR SHALL PROVIDE A DUSTING OF SAND WHERE EXCESS EMULSION CAUSES ASPHALT PICK-UP OR SLIPPERY SURFACE. CONTRACTOR SHALL REMOVE EXISTING VEGETATION FROM ALL CRACKS, AND JOINTS, SAND BLAST OR AIR BLAST, APPLY WEED KILLER AND HOT TAR SEAL, PATCH AND REPAIR PAVEMENT FAILURES, ALL PRIOR TO APPLICATION OF SEAL COAT. FIELD VERIFY LIMITS OF SEAL COAT IN AREAS OF NEW STRIPING, PATCHES AND CONFIRM WITH PROJECT MANAGER PRIOR TO PREP AND APPLICATION.

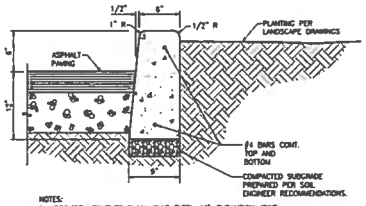
ASPHALT PAVEMENT SECTION (HEAVY)
NOT TO SCALE



JOINT AT ISLAND END (TYPICAL) (SEE ARCHITECTURAL PLANS)
NOT TO SCALE

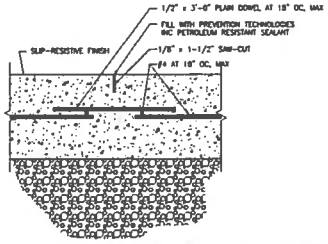


B SECTION B
NOT TO SCALE

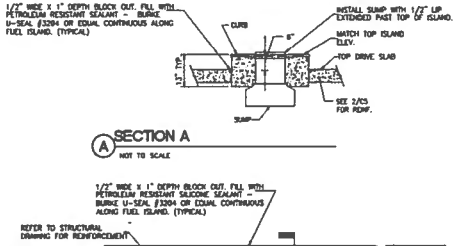


NOTES:
1. PROVIDE WEAKENED PLAIN JOINT EVERY 10', EXPANSION JOINT EVERY 30' AND @ THE START AND FINISH OF ALL CURVED SECTIONS
2. PAINT CURBS WHERE NOTED ON ARCH. SITE PLAN
3. PREPARATION OF SUBGRADE SHALL BE PER PROCEDURES OUTLINED IN THE LATEST EDITION OF THE SOILS REPORT.
4. CONCRETE SHALL BE Type II or V AND SHALL BE 560-C-3250.

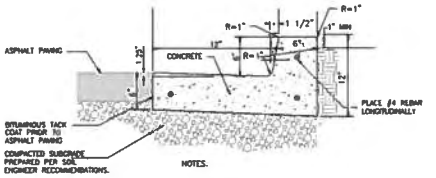
CEMENT CONCRETE BARRIER CURB
N.T.S.



SAW-CUT SHRINKAGE JOINT (SAWED) (SEE ARCHITECTURAL SHEET AG-1 FOR JOINT LOCATION, SEE AG-5 FOR DETAIL.)
NOT TO SCALE

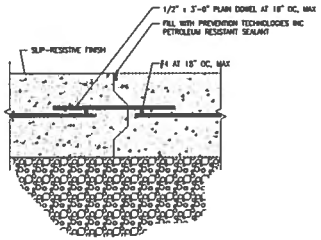


A SECTION A
NOT TO SCALE

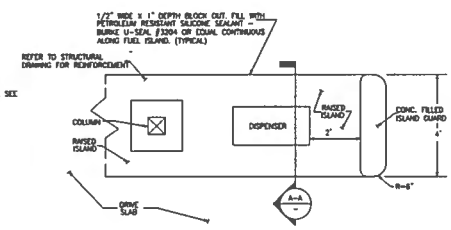


NOTES.
1. EXPANSION JOINT AT 20' INTERVALS
2. CONCRETE SHALL BE TYPE 2

CEMENT CONCRETE CURB AND GUTTER (PVT)
N.T.S



CONSTRUCTION JOINT (TYPICAL) (SEE ARCHITECTURAL PLANS)
NOT TO SCALE



NOTES:
1. THE HIGHEST OPERABLE PART OF EACH PRIMARY OR ALTERNATE CARD READER SHALL BE NO MORE THAN 54" (1372 mm) MEASURED FROM THE BASE OF THE FUEL DISPENSER. WHERE CARD READERS ARE LOCATED ON FREE STANDING PEDESTALS, THE CARD READING CONTROL FUNCTION SHALL BE NO MORE THAN 54" (1372 mm) ABOVE AN ACCESSIBLE PATH OF TRAVEL.
2. AN ACCESSIBLE PATH OF TRAVEL SHALL BE PROVIDED TO THE BASE OF ALL FUEL DISPENSERS REQUIRED TO MEET THE PROVISIONS OF THIS SECTION. SUCH FUEL DISPENSERS SHALL BE MOUNTED ON THE ACCESSIBLE LEVEL AREA.
3. AN ACCESSIBLE LEVEL AREA SHALL BE PROVIDED WHICH IS MINIMALLY 30" BY 48" (762 mm BY 1219 mm) LEVEL AND CLEAR. THIS AREA SHALL BE PROVIDED WITHIN 10" (254 mm) IN PLAIN VIEW OF THE FACE OF CONTROLS AND SHALL NOT BE OBSTRUCTED BY ANY FEATURES, EXCEPT PUMP NOZZLES AND HOSES, WITH THE LONG SIDE OF THIS SPACE PARALLEL TO AND CENTERED (PLUS OR MINUS 6" (229 mm)) WITH THE FACE OF THE CARD-READER CONTROLS.

ISLAND PLAN
NOT TO SCALE

No.	Date	By	Chk.	Appr.	
4	5/29/13	JD	CJH	HPG	LAND USE SUBMITTAL
3	1/7/15	JD	CJH	HPG	PROJECT RESUBMITTAL

Title: CONSTRUCTION NOTES AND DETAILS
2400 MONUMENT BOULEVARD
CONCORD, CA 94518
COSTCO FUEL FACILITY #663

For: CostcoGASOLINE
COSTCO WHOLESALE
999 LAKE DRIVE
ISSAQUAH, WA 98027

LICENSED PROFESSIONAL ENGINEER
HAI P. CHUNG
67814
CIVIL
STATE OF CALIFORNIA

Scale: Horizontal NA; Vertical N/A
Designed JD; Drawn JD; Checked CJH; Approved HPG; Date 12/13/14

BARGHAUSEN CONSULTING ENGINEERS
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CIVIL ENGINEERING, LAND PLANNING, SURVEYING, ENVIRONMENTAL SERVICES

Job Number: 7340
Sheet: C5.6

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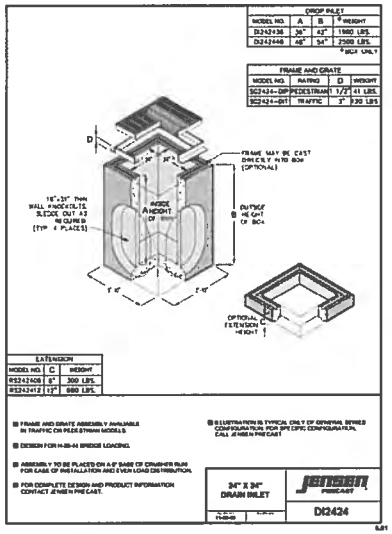
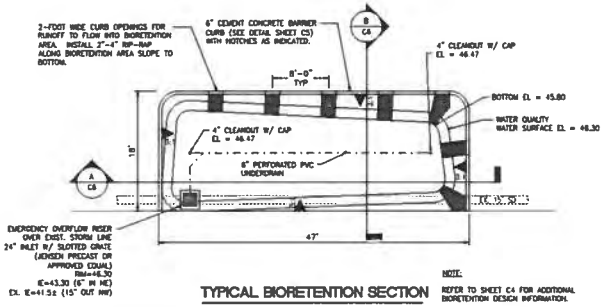
CONSTRUCTION NOTES AND DETAILS

COSTCO WHOLESALE FUEL FACILITY EXPANSION
2400 MONUMENT BOULEVARD, CONCORD, CA 94518
COSTCO FACILITY #663



JENSEN DRAIN INLET

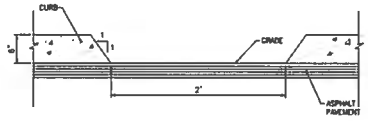
N.T.S.



TYPICAL BIORETENTION SECTION

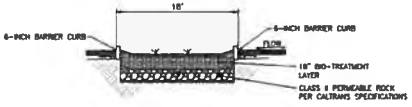
NOT TO SCALE

NOTE:
REFER TO SHEET C4 FOR ADDITIONAL BIORETENTION DESIGN INFORMATION.



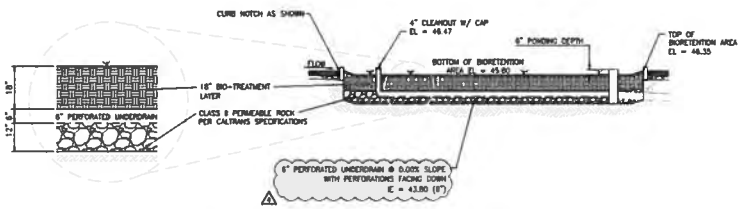
CURB NOTCH

NOT TO SCALE



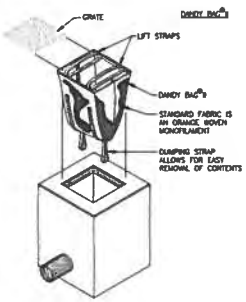
B SECTION B

NOT TO SCALE



A SECTION A

NOT TO SCALE



DANDY BAG ®

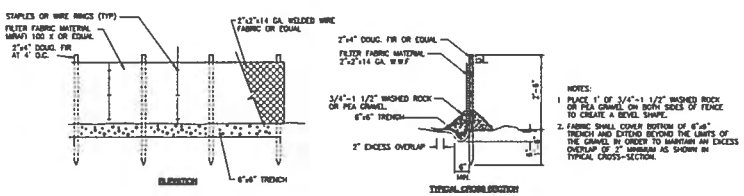
INSTALLATION AND MAINTENANCE GUIDELINES.

INSTALLATION. REMOVE THE GRATE FROM CATCH BASIN. IF USING OPTIONAL OIL ABSORBENTS, PLACE ABSORBENT PILLOW IN UNIT. STAND THE GRATE ON END. MOVE THE TOP LIFTING STRAPS OUT OF THE WAY AND PLACE THE GRATE INTO THE DANDY BAG® SO THAT THE GRATE IS BELOW THE TOP STRAPS AND ABOVE THE LOWER STRAPS. HOLDING THE LIFTING DEVICES, INSERT THE GRATE INTO THE INLET

MAINTENANCE: REMOVE ALL ACCUMULATED SEDIMENT AND DEBRIS FROM VICINITY OF UNIT AFTER EACH STORM EVENT. AFTER EACH STORM EVENT AND AT REGULAR INTERVALS, LOOK INTO THE DANDY BAG® IF THE CONTAINMENT AREA IS MORE THAN 1/3 FULL OF SEDIMENT, THE UNIT MUST BE EMPTIED. TO EMPTY UNIT, LIFT THE UNIT OUT OF THE INLET USING THE LIFTING STRAPS AND REMOVE THE GRATE. IF USING OPTIONAL OIL ABSORBENTS, REPLACE ABSORBENT WHEN NEAR SATURATION.

CATCH BASIN FILTER BAG

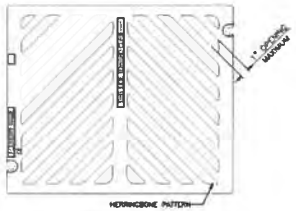
NOT TO SCALE



NOTES:
1. PLACE 1' OF 3/4"-1 1/2" WASHED ROCK OR PEA GRAVEL ON BOTH SIDES OF FENCE TO CREATE A BEVEL SHAPE.
2. FABRIC SHALL COVER BOTTOM OF 6"x6" TRENCH AND EXTEND BEYOND THE LIMITS OF THE GRAVEL IN ORDER TO MAINTAIN AN EXCESS OVERLAP OF 2" MINIMUM AS SHOWN IN TYPICAL CROSS-SECTION.

FILTER FABRIC FENCE DETAIL

NOT TO SCALE



COSTCO STANDARD STORM DRAIN GRATE

NOT TO SCALE

No.	Date	By	Chk	Appr.	Revision
4	5/26/15	JD	CJ	HPG	LAND USE SUBMITTAL
3	3/29/15	JD	CJ	HPG	PERMIT RESUBMITTAL

Title: CONSTRUCTION NOTES AND DETAILS
2400 MONUMENT BOULEVARD
CONCORD, CA 94518
COSTCO FUEL FACILITY #663

For: COSTCO GASOLINE
COSTCO WHOLESALE
999 LAKE DRIVE
ISSAQUAH, WA 98027

LICENSED PROFESSIONAL ENGINEER
HAI P GRUBB
67814
CIVIL
STATE OF CALIFORNIA

Scale: Horizontal NA, Vertical N/A

Designed JD
Drawn JD
Checked CJC
Approved HPG
Date 12/18/14

BARGHAUSEN CONSULTING ENGINEERS INC
18215 72ND AVENUE SOUTH
KENT, WA 98032
(425)251-6222
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CIVIL ENGINEERING, LAND PLANNING, SURVEYING, ENVIRONMENTAL SERVICES

Job Number 7340
Sheet C6 of 6

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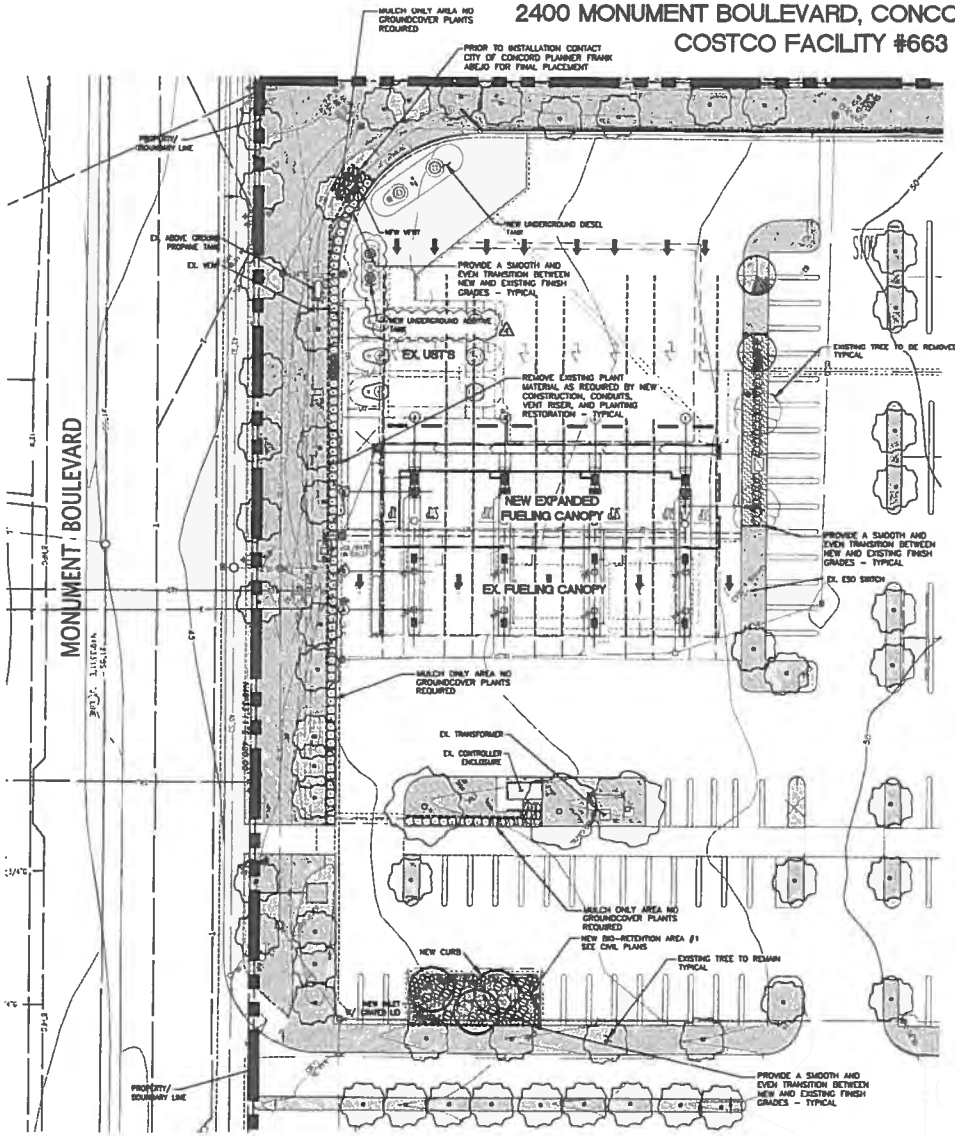
LANDSCAPE PLANTING PLAN

COSTCO WHOLESALE FUEL FACILITY EXPANSION
2400 MONUMENT BOULEVARD, CONCORD, CA 94518
COSTCO FACILITY #663



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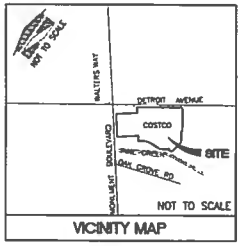

VICINITY MAP

LANDSCAPE PLANT MATERIAL LEGEND

SYMBOL	BOTANICAL / COMMON NAMES	SIZE CONDITION	SPACING	QUANTITY	REMARKS
	TREES:				
	FRAXINUS LATIFOLIA / OREGON ASH (BIO-RETENTION AREA)	1.25" CAL. MIN. 15 GALLON	AS SHOWN	3	STAKE & GUY ONE GROWING SEASON; NURSERY GROWN
	PINUS CANARIENSIS / CANARY ISLAND PINE (REPLACEMENT TREE)	24" BOX 6' HT. MIN.	AS SHOWN	3	STAKE & GUY ONE GROWING SEASON; NURSERY GROWN, UN-CUT LEADER, ALIGN TREE TRUNK WITH STALL STRIPPING
	EXISTING TREE				TO REMAIN, SAVE, AND PROTECT
	EXISTING TREE			2	TO BE REMOVED
	SHRUBS:				
	ABELIA GRANDIFLORA 'EDWARD GOUCHER' / EDWARD GOUCHER ABELIA	5 GALLON	3' O.C.	4	FULL AND BUSHY
	CEANOTHUS FOLIOSUS / COYOTE BRUSH (BIO-RETENTION AREA)	5 GALLON	5' O.C.	8	FULL AND BUSHY
	CISTUS SKANBERGII / HYBRID ROCKROSE (BIO-RETENTION AREA)	5 GALLON	3' O.C.	26	FULL AND BUSHY
	GAZANIA SPP. / TREASURE FLOWER (BIO-RETENTION AREA)	1 GALLON	2' O.C.	20	FULL
	IRIS DOUGLASIANA / DOUGLAS IRIS (BIO-RETENTION AREA)	1 GALLON	2' O.C.	25	FULL
	NERIUM OLEANDER 'MRS. ROEDING' / MRS. ROEDING OLEANDER	5 GALLON	3' O.C.	10	FULL AND BUSHY
	PODOCARPUS MACROPHYLLUS 'MAKI' / SHIMBERY YEW	15 GALLON 6'-7' HT.	3' O.C.	7	FULL AND BUSHY, VERTICAL FORM, MATCHING FORM AND HEIGHT, PRIOR TO INSTALLATION CONTACT CITY OF CONCORD PLANNER FRANK ABEJO AT 925-671-3120 FOR FINAL PLACEMENT, DOUBLE STAKE
	RHAPHIOLEPIS 'JACK EVANS' / JACK EVANS INDIAN HAWTHORN	5 GALLON	3' O.C.	84	FULL AND BUSHY
	GROUNDCOVERS:				
	CAREX SUBFUSCA / RUSTY SEDGE 75% ELEOCHARIS PALUSTRIS / CREEPING SPIKERUSH 25%	PLUGS	18" O.C.	AS REQ'D	THROUGHOUT BOTTOM OF BIO-RETENTION AREA IN RANDOM GROUPINGS OF 5 TO 10 PLANTS
	GAZANIA 'MITSUWA YELLOW' / YELLOW TRAILING GAZANIA	FLAT	12" O.C.	AS REQ'D	HOLD 12" FROM CURBS AND SHRUBS, INSTALL ON SOIL PRIOR TO MULCHING
	MULCH AREA				SEE LANDSCAPE PLANTING NOTES SHEET L-2
	EXISTING LANDSCAPE AND IRRIGATION				TO REMAIN, SAVE, AND PROTECT
	DENOTES LINE OF TRANSITION BETWEEN NEW CONSTRUCTION AND EXISTING CONDITIONS. ALL AREAS DISTURBED BY NEW CONSTRUCTION ARE TO BE RESTORED AS INDICATED ON PLANS AND/OR TO MATCH EXISTING CONDITIONS PRIOR TO DISTURBANCE.				

No.	Date	By	Chk'd	Appr.	Revision
1	03/06/13	MM	CMT	HPG	LAND USE SUBMITTAL
2	03/22/13	MJS	CMT	HPG	PER CITY COMMENTS
	03/02/13				BID RELEASE

TITLE: LANDSCAPE PLANTING PLAN
2400 MONUMENT BOULEVARD
CONCORD, CA 94518
COSTCO GASOLINE FACILITY #663

For: COSTCO GASOLINE
COSTCO WHOLESALE
999 LAKE DRIVE
ISSAQUAH, WA 98027

REGISTERED LANDSCAPE ARCHITECT
APRIL L. ROSENTHAL
5410
03/07/13
STATE OF CALIFORNIA

Scales: Horizontal 1"=20'-0" Vertical N/A

Designed MJS Drawn MJS Checked CMT Approved MPG Date 3/06/13

BARGHAUSEN CONSULTING ENGINEERS, INC.
18215 72ND AVENUE SOUTH
KENT, WA 98032
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CIVIL ENGINEERING, LAND PLANNING, SURVEYING, ENVIRONMENTAL SERVICES

Job Number: 7340

Sheet: L1 of 4

Plot: 3/11/2013 1:40 pm Dwg: J:\Projects\7340 Costco Issaquah\7340-L1-2.dwg Date/Time: 3/5/2013 1:47 PM Save: 3/5/2013 KSLUDER File: ----

LANDSCAPE PLANTING NOTES AND DETAILS
COSTCO WHOLESALE FUEL FACILITY EXPANSION
2400 MONUMENT BOULEVARD, CONCORD, CA 94518
COSTCO FACILITY #663

LANDSCAPE PLANTING NOTES AND MATERIALS

SCOPE OF WORK

FURNISH ALL MATERIALS, LABOR, EQUIPMENT AND RELATED ITEMS NECESSARY TO ACCOMPLISH THE TREATMENT AND PREPARATION OF SOIL, FINISH GRADING, PLACEMENT OF SPECIFIED PLANT MATERIALS, FERTILIZER, STAKING, MULCH, CLEAN-UP, DEBRIS REMOVAL, AND 90-DAY MAINTENANCE.

QUALIFICATIONS:
LANDSCAPE CONTRACTOR TO BE SKILLED AND KNOWLEDGEABLE IN THE FIELD OF WORK. CONTRACTOR TO BE LICENSED TO PERFORM THE WORK SPECIFIED WITHIN THE PRESIDING JURISDICTION.

JOB CONDITIONS:
IT IS THE CONTRACTOR'S RESPONSIBILITY TO REVIEW THE SITE AND REPORT ANY DISCREPANCIES TO THE OWNER OR THE OWNER'S REPRESENTATIVES. ALL PLANT MATERIAL AND FINISH GRADES ARE SUBJECT TO APPROVAL BY THE OWNER.

PROTECTION:
SAVE AND PROTECT ALL EXISTING PLANTINGS SHOWN TO REMAIN. DO NOT PLANT UNTIL OTHER CONSTRUCTION OPERATIONS WHICH CONFLICT HAVE BEEN COMPLETED. THE EXISTING IRRIGATION SYSTEM IS TO BE MODIFIED. DO NOT PLANT UNTIL THE SYSTEM HAS BEEN TESTED AND APPROVED. HANDLE PLANTS WITH CARE - DO NOT DAMAGE OR BREAK ROOT SYSTEM, BARK, OR BRANCHES. REPAIR AND/OR REPLACE ITEMS DAMAGED AS A RESULT OF WORK, OR WORK NOT IN COMPLIANCE WITH PLANS AND SPECIFICATIONS, AS DIRECTED BY OWNER AT NO ADDITIONAL COST.

REPAIR OF EXISTING PLANTINGS:
DURING THE COURSE OF WORK, REPAIR ALL EXISTING PLANTING AREAS BY PRUNING DEAD GROWTH, RE-ESTABLISHING FINISH GRADE AND RE-MULCHING TO SPECIFIED DEPTH.

GUARANTEE:
GUARANTEE ALL PLANT MATERIAL FOR A PERIOD OF ONE YEAR FROM DATE OF FINAL ACCEPTANCE OF THE JOB BY OWNER.

MAINTENANCE:
CONTRACTOR TO PROVIDE OWNER WITH A SCOPE OF WORK AT TIME OF INITIAL PROJECT BID TO PROVIDE LANDSCAPE AND IRRIGATION MAINTENANCE UNTIL FINAL ACCEPTANCE OF PROJECT AND FACILITY BY OWNER. WORK TO INCLUDE MAINTENANCE AS DESCRIBED BELOW, IN PLANTING AND IRRIGATION MAINTENANCE

MATERIALS:

PLANT MATERIALS:
PLANT MATERIALS TO BE GRADE NO. 1, SIZED IN ACCORDANCE WITH (AAN) AMERICAN STANDARDS FOR NURSERY STOCK (ANSI Z60.1-1986). PRUNE PLANTS RECEIVED FROM THE NURSERY ONLY UPON AUTHORIZATION BY THE LANDSCAPE ARCHITECT. "B & B" INDICATES BALLED AND BURLAPPED; "CONT." INDICATES CONTAINER; "BR" INDICATES BARE ROOT; "CAL" INDICATES CALIPER AT 6" ABOVE SOIL LINE; "GAL" INDICATES GALLON.

A) SPECIFIED PLANT CANOPY SIZE OR CALIPER IS THE MINIMUM ACCEPTABLE CONTAINER OR BALL SIZE ESTABLISHES MINIMUM PLANT CONDITION TO BE PROVIDED.

B) QUALITY:
PLANT MATERIAL TO COMPLY WITH STATE AND FEDERAL LAWS FOR DISEASE INSPECTION. PLANTS TO BE FULLY LIVE, VIGOROUS, WELL FORMED, WITH WELL DEVELOPED FIBROUS ROOT SYSTEMS. ROOT BALLS OF PLANTS TO BE SOLID AND FIRMLY HELD TOGETHER, SECURELY CONTAINED AND PROTECTED FROM INJURY AND DESICCATION.
PLANTS DETERMINED BY LANDSCAPE ARCHITECT TO HAVE BEEN DAMAGED; HAVE DEFORMITIES OF STEM, BRANCHES, OR ROOTS; LACK SYMMETRY, HAVE MULTIPLE LEADERS OR "Y" CROTCHES LESS THAN 30 DEGREES IN TREES, OR DO NOT MEET SIZE OR ANSI STANDARDS WILL BE REJECTED.
PLANT MATERIAL TO BE FROM A SINGLE NURSERY SOURCE FOR EACH SPECIFIED SPECIES/HYBRID. NURSERY SOURCES TO BE THOSE LOCATED IN THE SAME REGION AS THE JOB SITE.

C) SUBSTITUTION:
NO SUBSTITUTION OF PLANT MATERIAL, SPECIES OR VARIETY, WILL BE PERMITTED UNLESS WRITTEN EVIDENCE IS SUBMITTED TO THE OWNER FROM TWO QUALIFIED PLANT BROKERAGE OFFICES. SUBSTITUTIONS WHICH ARE PERMITTED TO BE IN WRITING FROM THE OWNER, CITY INSPECTOR, AND LANDSCAPE ARCHITECT. THE SPECIFIED SIZE, SPECIES AND NEAREST VARIETY, AS APPROVED, TO BE FURNISHED.

SOIL PREPARATION:
SPECIFIC MATERIALS AND QUANTITIES, AS NOTED HEREIN, ARE FOR BIDDING ONLY. THE FOLLOWING: TOPSOIL, AMENDMENT, AND BACKFILL, ARE GENERAL REQUIREMENTS FOR ALL LANDSCAPE AREAS. ACTUAL MATERIALS AND QUANTITIES WILL BE BASED ON A SOIL TEST TAKEN AFTER COMPLETION OF ROUGH GRADING.

SOIL FERTILITY AND AGRICULTURAL SUITABILITY ANALYSIS:
AFTER ROUGH GRADING AND PRIOR TO SOIL PREPARATION, CONTRACTOR TO OBTAIN AGRONOMIC SOILS TESTS FOR PLANTING AREAS. A MINIMUM OF ONE SAMPLE TO BE OBTAINED. IF ON-SITE TOPSOIL HAS BEEN STOCKPILED, A TEST TO BE COMPLETED FOR IT, ALSO. ALL SOIL TESTS TO INCLUDE: ORGANIC MATTER CONTENT, N,P,K, pH, EC, SOIL TEXTURE, AMENDMENTS, LEACHING, AND MAINTENANCE FERTILIZATIONS ANALYSIS. WRITTEN RECOMMENDATIONS FOR SOIL AMENDMENT, FERTILIZER, CONDITIONERS, APPLICATION RATES, AND POST-CONSTRUCTION MAINTENANCE PROGRAM. TESTS TO BE PERFORMED BY A CITY APPROVED SOIL TESTING LABORATORY WHICH WILL BE CONTRACTED WITH AND PAID FOR BY THE CONTRACTOR. TEST RESULTS AND RECOMMENDATIONS TO BE SUBMITTED TO THE CITY, OWNER AND LANDSCAPE ARCHITECT FOR APPROVALS PRIOR TO CONSTRUCTION. ANY PRODUCT SUBSTITUTIONS TO BE REVIEWED AND APPROVED BY THE CITY.

RECOMMENDATIONS OF THE SOILS REPORT AND REQUIREMENTS OF THE GEOTECHNICAL ENGINEER TO TAKE PRECEDENCE OVER THE MINIMUMS NOTED BELOW. PROVIDE CHANGE ORDER FOR ADDITIONAL MATERIALS REQUIRED IN THE SOILS REPORT.

A) TOPSOIL
AS A MINIMUM SUPPLY TOPSOIL CONSISTING OF LOAM SOIL WITH 5 TO 7 PERCENT ORGANIC MATTER. TOPSOIL TO BE AMENDED WITH SPECIFIC AMENDMENTS IN C)1., 2., 3., AND 4., BELOW, AND BE BLENDED TO SPECIFIED DEPTH IN E.), BELOW. LOAM TO CORRESPOND TO FIELD METHOD OF DETERMINING SOIL TEXTURE CLASSES FOR LOAM AND SILT LOAM, U.S. SOIL CONSERVATION SERVICE. PROVIDE LANDSCAPE ARCHITECT THE TOPSOIL SUPPLIER AND SAMPLE OF TOPSOIL. CONTRACTOR IS RESPONSIBLE FOR ANY NECESSARY WEED CONTROL RESULTING FROM CONTAMINATED OFF-SITE SOURCES.

B) NATIVE SURFACE SOIL INCLUDING STOCKPILED TOPSOIL
SURFACE SOIL ON-SITE MAY MEET TEXTURAL CLASSIFICATION AS NOTED IN A), ABOVE. PROVIDE AMENDMENTS IN C) 1., 2., 3., AND 4., BELOW, AND EVENLY BLEND AMENDMENTS TO SPECIFIED DEPTH.

C) AMENDMENT
1. TOPSOIL FOR PLANTING TO CONTAIN A MINIMUM OF 10 PERCENT ORGANIC MATERIAL BY VOLUME
2. ORGANIC COMPOST
USE BULK NITROFIED GROUND FIR BARK. COMPOST TO BE FREE FROM NON-FARM SOURCES, NOR FROM SOURCES CONTAINING REDWOOD/CEDAR PRODUCTS.
3. FERTILIZER
INSTALLATION FERTILIZER TO BE 6-20-20
MAINTENANCE FERTILIZER TO BE 21-0-0
AGRIFORM TABLETS TO BE 21 AND 5 GRAM SIZE, 20-20-5 BY AGRIFORM INTERNATIONAL CHEMICALS, INC. OR EQUIVALENT
4. SOIL AMENDMENTS

SOIL SULFUR	14.0 POUNDS PER 1,000 SF
ORGANIC AMENDMENT	2.0 YARDS PER 1,000 SF
N-P-K FERTILIZER	20.0 POUNDS PER 1,000 SF
SULFATE-SULFUR	LOW SULFATE COMPENSATED BY OTHER SOIL IMPROVEMENTS

D) PLANTING BACKFILL
MIX THREE PARTS OF SITE/NATIVE SOIL AND/OR TOPSOIL WITH ONE PART ORGANIC AMENDMENT (PREFERABLY NITROGEN AND IRON FORTIFIED).
2.5 POUNDS OF 6-20-20 FERTILIZER PER YARD MIX.
SLOW RELEASE FERTILIZER TABLETS:

CONTAINER SIZE	TABLETS/SIZE	
1 GALLON	3	21 GRAM
5 GALLON	3	21 GRAM
15 GALLON	16	21 GRAM
24" BOX	32	21 GRAM

E) SOIL PREPARATION
REMOVE FROM SITE ALL WEEDS AND DEBRIS WITHIN PROPOSED LANDSCAPE AREAS
VERIFY SUB-GRADES AT -6 INCHES BELOW FINISH ELEVATION IN ALL SHRUB AND GROUNDCOVER AREAS.
DO NOT WORK SOIL WHEN MOISTURE CONTENT IS SO GREAT THE EXCESS COMPACTION WILL OCCUR NOR WHEN IT IS SO DRY THAT DUST WILL FROM IN THE AIR OR THAT CLODS WILL NOT BREAK READILY. APPLY WATER IF NECESSARY TO PROVIDE IDEAL MOISTURE CONTENT FOR FILLING AND FOR PLANTING AS SPECIFIED.
THOROUGHLY SCARIFY AND RIP ALL LANDSCAPE GRADES WHICH HAVE BECOME COMPACTED TO A DEPTH OF 12 INCHES WITH MULTIPLE PASSES, 90 DEGREES TO EACH OTHER. SCARIFY AREAS INACCESSIBLE TO MECHANIZED EQUIPMENT WITH HAND TOOLS. REMOVE ALL SURFACE LUMPS, ROCKS, VEGETATION AND/OR DEBRIS LARGER THAN 1-INCH FROM ALL GRADES PRIOR TO ANY SOIL PREPARATION.
THOROUGHLY ROTOTILL ALL LANDSCAPE AREAS TO A DEPTH OF 6 INCHES. PLACE ADDITIONAL AMENDED SOIL AS REQUIRED TO MEET FINISH ELEVATIONS.
APPLY SOIL PREPARATION MATERIALS TO ALL PLANTING AREAS AND THOROUGHLY INCORPORATE INTO THE TOP 6 INCHES OF SOIL.
WET SOIL THOROUGHLY AND ALLOW TO SETTLE. REPEAT THIS COMPACTION PROCEDURE UNTIL SOIL IS STABLE ENOUGH TO PERMIT AERATION AND DRAINAGE FOR PLANT MATERIAL. FINISH GRADE ALL PLANTING AREAS TO A SMOOTH, UNIFORM SURFACE DRAINING AWAY FROM THE BUILDING AND READY FOR PLANTING. FINISH GRADE TO BE 2 INCHES BELOW FINISH SURFACE OF ADJACENT PAVED SURFACES. FINISH GRADE TO BE APPROVED PRIOR TO PLACEMENT OF ANY PLANT MATERIAL.

BARK MULCH (TOPDRESSING).
ONE-HALF-INCH (1/4") SIZE, TO ONE-INCH (1/2"), I.E., "FINE," HEMLOCK/FIR BARK.
SUBMIT SAMPLE TO OWNER FOR APPROVAL PRIOR TO SITE DELIVERY.

STAKES:
2-INCH DIAMETER BY 10-FOOT MINIMUM LODGEPOLE PINE STAKES.

GUY MATERIAL:
1-INCH WIDE POLYETHYLENE CHAIN LOCK TYPE TIES; OR, 3/8" DIAMETER RUBBER. NO WIRE.

HERBICIDE:
HERBICIDE IS NOT RECOMMENDED FOR THE FIRST YEAR AFTER INSTALLATION.

ANTI-DESICCANT:
"WILT-PROOF," 48 HOURS PRIOR TO SHIPMENT TO SITE FROM JUNE 1 THROUGH SEPTEMBER. THOROUGHLY WATER PLANTS PRIOR TO DELIVERY. PLANT MATERIAL DELIVERED TO SITE TO BE KEPT CONTINUALLY MOIST THROUGH INSTALLATION.

EXECUTION:

FINISH GRADES:
FINE GRADE AND REMOVE ROCKS AND FOREIGN OBJECTS OVER TWO INCHES (2") DIAMETER FROM TOP THREE INCHES (3") OF PREPARED PLANTING BED. ALL FINISHED GRADES TO BE SMOOTH EVEN GRADES, LIGHTLY COMPACTED, AS SHOWN ON THE PLAN AND DETAILED. SITE CIVIL DRAWINGS IDENTIFY FINAL ELEVATIONS.
PROVIDE POSITIVE DRAINAGE AWAY FROM STRUCTURE MINIMUM 2 PERCENT.

TREES AND SHRUBS:
ARRANGE TREES AND SHRUBS ON SITE IN PROPOSED LOCATIONS PER DRAWINGS. EXCAVATE PIT, PLANT AND STAKE OR GUY, AS CALLED OUT AND DETAILED. ALL TREES, SHRUBS, AND SUPPORTS TO STAND VERTICAL. BACKFILL TO BE PIT SPOILS. SETTLE BACKFILL USING WATER ONLY. NO MECHANICAL COMPACTION. ALL TREES TO BE MINIMUM 5 FEET FROM CURB.

GROUNDCOVERS:
EXCAVATE PITS TO A MINIMUM OF THREE INCHES (3") BELOW, AND TWICE THE ROOT BALL DIAMETER. WATER THOROUGHLY AND TAKE CARE TO ENSURE THAT ROOT CROWN IS AT PROPER GRADE, AS DETAILED.

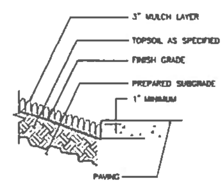
MULCH:
MULCH ALL NEW AND DISTURBED LANDSCAPE AREAS. MULCH TO BE APPLIED AFTER INSTALLATION OF GROUNDCOVER. NO MULCH REQUIRED IN THE BIO-RETENTION POND AREA.

UTILITY CLEARANCES:
FIELD ADJUST PLANT LOCATIONS FOR 8-FOOT SEPARATION OF TREES/SHRUBS AND 2-FOOT SEPARATION FOR GROUNDCOVER FROM FIRE HYDRANTS AND UTILITY VAULTS.

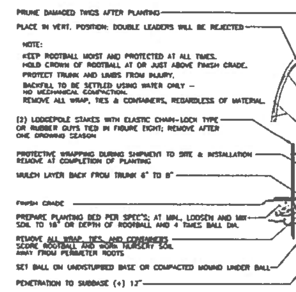
PLANTING MAINTENANCE:
CONTRACTOR TO MAINTAIN PLANTINGS THROUGH COMPLETED INSTALLATION, AND UNTIL ACCEPTANCE OF LANDSCAPE INSTALLATION. PLANTING MAINTENANCE TO INCLUDE WATERING, WEEDING, CULTIVATING, TIGHTENING AND REPAIRING OF TREE GUYS, RESETTING PLANTS TO PROPER GRADES OR POSITION, AND RE-ESTABLISHING SETTLED GRADES. HERBICIDE IS NOT RECOMMENDED FOR FOR ONE YEAR FOLLOWING LANDSCAPE INSTALLATION. INCLUDED IS REPLACEMENT OF DEAD PLANTS AND PLANTS SHOWING LOSS OF 40 PERCENT OR MORE OF CANOPY.

IRRIGATION MAINTENANCE:
THE IRRIGATION SYSTEM TO BE MAINTAINED INCLUDING ADJUSTMENTS FOR BALANCED WATER DISTRIBUTION & PRECIPITATION. FAILED OR MALFUNCTIONING IRRIGATION EQUIPMENT SHALL BE REPLACED OR CORRECTED. PLANT AND IRRIGATION MAINTENANCE TO INCLUDE THOSE OPERATIONS NECESSARY TO THE PROPER GROWTH AND SURVIVAL OF ALL PLANT MATERIALS. CONTRACTOR TO PROVIDE THIS WORK IN ADDITION TO SPECIFIC WARRANTY/GUARANTEES.

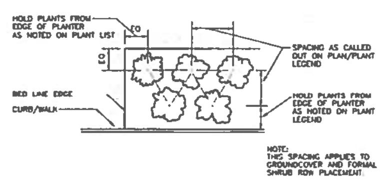
EXISTING CONDITIONS:
THIS PLAN HAS BEEN PREPARED WITHOUT THE BENEFIT OF LANDSCAPE AND IRRIGATION INSTALLATION RECORD, OR AS-BUILT DRAWINGS. EXISTING INFORMATION HAS BEEN ASSUMED. CONTRACTOR TO TO VERIFY ALL CONDITIONS ON SITE PRIOR TO STARTING ANY WORK AND NOTIFY OWNER'S REPRESENTATIVE OF ANY CONFLICTS.



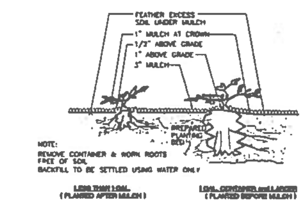
TYPICAL PLANTER SECTION
NOT TO SCALE



TREE PLANTING / STAKING DETAIL
NOT TO SCALE



PLANT MATERIAL SPACING DETAIL
NOT TO SCALE



SHRUB / GROUNDCOVER PLANTING DETAIL
NOT TO SCALE

No.	Date	By	Ckd.	Appr.	Revision
4	05/06/15	MJK	CMT	HPG	LAND USE SUBMITTAL
3	03/20/15	MJK	CMT	HPG	PERMIT RESUBMITTAL
2	01/22/15	AMS	CMT	HPG	BID RELEASE

Title: LANDSCAPE PLANTING NOTES AND DETAILS
2400 MONUMENT BOULEVARD
CONCORD, CA 94518
COSTCO GASOLINE FACILITY #663

For: COSTCO GASOLINE
COSTCO WHOLESALE
999 LAKE DRIVE
ISSAQUAH, WA 98027

Designed AMS · Drawn AMS · Checked CMT · Approved HPG · Date 01/06/15
Scale: Horizontal N/A · Vertical N/A

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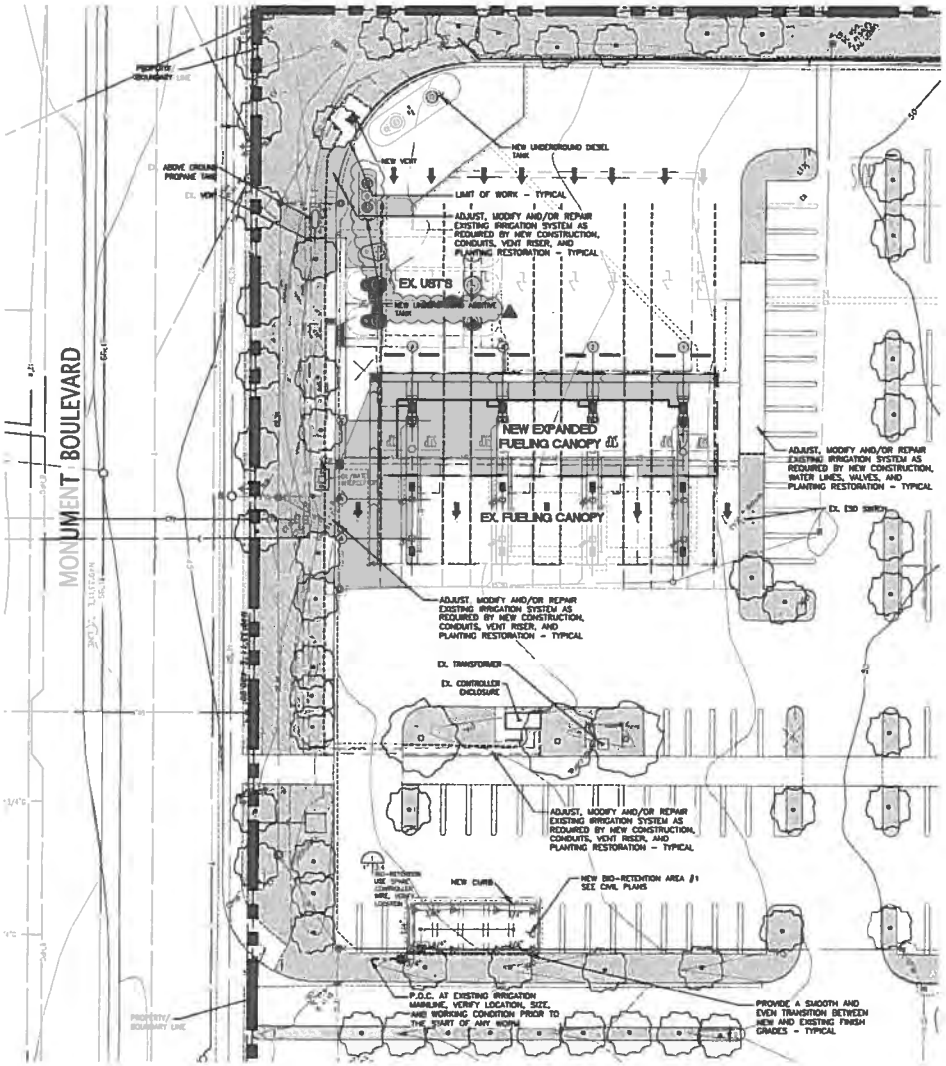
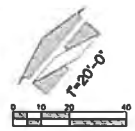
CIVIL ENGINEERING, LAND PLANNING, SURVEYING, ENVIRONMENTAL SERVICES

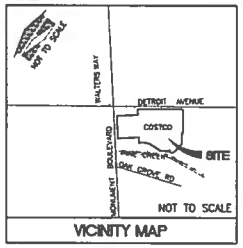
Job Number 7340
Sheet L2 of 4

LANDSCAPE IRRIGATION PLAN

COSTCO WHOLESALE FUEL FACILITY EXPANSION
2400 MONUMENT BOULEVARD, CONCORD, CA 94518
COSTCO FACILITY #663







VICINITY MAP

LANDSCAPE IRRIGATION LEGEND

DESCRIPTION: 1812 HIGH POP-UP BODY WITH SPRAY ROTARY NOZZLE

SYMBOL	NOZZLE	PSI	GPM	PRECIP.	RADIUS
▷▷▷▷▷▷	RAINBIRD 15 F, H, Q SERIES	35	1.73, 0.86, 0.43	0.61	18'
●	RAINBIRD 100 PEB REMOTE CONTROL VALVE, IN BOX. VERIFY EXISTING SPEAR CONTROL WIRE. IF SPEAR WIRE IS NOT AVAILABLE USE RAINBIRD TBOS-3CM1 - 1 STATION CONTROL MODULE WITH BATTERY				
NOT SHOWN	EXISTING BACKFLOW ASSEMBLY, TO REMAIN IN USE; VERIFY SIZE, LOCATION, AND WORKING CONDITION ON SITE PRIOR TO THE START OF ANY WORK				
NOT SHOWN	EXISTING AUTOMATIC CONTROLLER, TO REMAIN IN USE; VERIFY SIZE, LOCATION, SPARE STATION, AND WORKING CONDITION ON SITE PRIOR TO THE START OF ANY WORK				
NOT SHOWN	EXISTING RAIN SENSOR, TO REMAIN IN USE; VERIFY LOCATION AND WORKING CONDITION ON SITE PRIOR TO THE START OF ANY WORK				
- · - · - · -	MAINLINE - CLASS 200 PVC (18" COVER); VERIFY SIZE, LOCATION, AND WORKING CONDITION ON SITE PRIOR TO THE START OF ANY WORK				
———	LATERAL - CLASS 200 PVC (12" COVER); SIZE PER PLAN				
10 / 1 / 1"	TYPICAL EXISTING VALVE CALL-OUT VALVE STATION NUMBER VALVE GPM VALVE SIZE				
	EXISTING LANDSCAPE AND IRRIGATION TO REMAIN, SAVE, AND PROTECT				
	EXISTING TREE TO REMAIN, SAVE, AND PROTECT				

IRRIGATION SHOWN DIAGRAMATICALLY FOR PLAN CLARITY. COMMON TRENCH AND PLACE EQUIPMENT IN LANDSCAPE; MANIFOLD GROUPED VALVES IN ADJACENT SHRUB AREAS WHERE FEASIBLE.

REPAIR AND/OR REPLACE IRRIGATION SYSTEM DISTURBED BY NEW CONSTRUCTION, AS REQUIRED, TO MATCH OR BETTER THAN EXISTING CONDITIONS PRIOR TO THE START OF ANY WORK FOR FULL COVERAGE AND A FUNCTIONAL SYSTEM.

No.	Date	By	Description
1	03/04/15	SCK	LAND USE SUBMITTAL
2	03/27/15	CMT	PER REVIEW COMMENTS
3	05/15/15	MPG	PER REVISED SITE PLAN

Title: LANDSCAPE IRRIGAION PLAN
2400 MONUMENT BOULEVARD
CONCORD, CA 94518
COSTCO GASOLINE FACILITY #663

COSTCO GASOLINE
COSTCO WHOLESALE
999 LAKE DRIVE
ISSAQUAH, WA 98027

REGISTERED LANDSCAPE ARCHITECT
NIGEL K. MOORE
3410
STATE OF CALIFORNIA

Scale: Horizontal 1"=30'-0" Vertical N/A

Designed JMS
Drawn JMS
Checked CMT
Approved JPR
Date 3/26/15

BARGHAUSEN CONSULTING ENGINEERS
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CIVIL ENGINEERING, LAND PLANNING, SURVEYING, ENVIRONMENTAL SERVICES

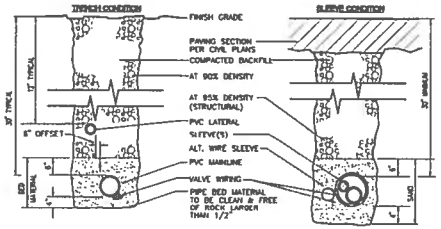
Job Number 7340
Sheet L3.4

LANDSCAPE IRRIGATION NOTES AND DETAILS

COSTCO WHOLESALE FUEL FACILITY EXPANSION
2400 MONUMENT BOULEVARD, CONCORD, CA 94518
COSTCO FACILITY #663

LANDSCAPE IRRIGATION NOTES

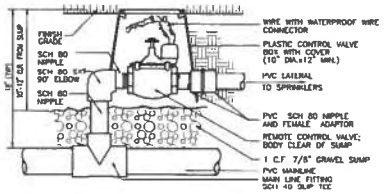
1. PROVIDE A COMPLETE, OPERABLE, AND AUTOMATIC MODIFICATION TO THE EXISTING IRRIGATION SYSTEM FOR ALL NEW LANDSCAPE AREAS IDENTIFIED ON THIS PLAN.
2. VISIT SITE AND VERIFY LOCATIONS OF ALL EXISTING IRRIGATION COMPONENTS AND COVERAGE PRIOR TO COMMENCEMENT OF WORK. PROMPTLY NOTIFY THE GENERAL CONTRACTOR OF ANY CONFLICTS OR OBSTRUCTIONS.
3. PROVIDE PROTECTION OF ALL PROPERTY, WORK IN PROGRESS, EXISTING LANDSCAPE AND EXISTING IRRIGATION SYSTEM. ALL DAMAGE CAUSED BY THE CONTRACTOR TO BE REPAIRED TO MATCH EXISTING CONDITIONS, BEFORE CONSTRUCTION, AT NO ADDITIONAL EXPENSE TO OWNER.
4. AT ALL TIMES MAINTAIN IN PROPER WORKING ORDER ALL EXISTING IRRIGATION SYSTEM THROUGHOUT CONSTRUCTION.
5. CONNECT NEW IRRIGATION COMPONENTS TO EXISTING IRRIGATION SYSTEM AS REQUIRED. USE EXISTING BACKFLOW ASSEMBLY, IRRIGATION WATER METER, MAINLINE, CONTROL WIRES, ETC. AS REQUIRED. SEE NOTE 27 BELOW.
6. REMOVE EXISTING IRRIGATION SYSTEM AND COMPONENTS, AS REQUIRED, PRIOR TO NEW CONSTRUCTION. CAP (WATER TIGHT) ALL MAINLINE, LATERALS, CONTROL WIRES, ETC., FOR MODIFICATION AND/OR RECONNECTION.
7. OBTAIN AND PAY FOR ALL NECESSARY PERMITS AND FEES AS REQUIRED BY APPLICABLE CODES AND ORDINANCES FOR THIS WORK. ALL WORK TO BE INSTALLED PER LOCAL CODE REQUIREMENTS AND MANUFACTURER'S WRITTEN SPECIFICATIONS.
8. CONTRACTOR TO BE RESPONSIBLE FOR ANY AND ALL COORDINATION WITH GENERAL AND SUB-CONTRACTORS AS REQUIRED TO ACCOMPLISH THEIR WORK.
9. GENERAL CONTRACTOR AND LANDSCAPE CONTRACTOR TO COORDINATE AND VERIFY:
   A. EXISTING 110V ELECTRICAL SERVICE FROM ELECTRICAL SOURCE TO AUTOMATIC CONTROLLERS.
   B. EXISTING IRRIGATION/SERVICE METER.
   C. STATIC WATER PRESSURE AT POINT-OF-CONNECTION (P.O.C.) CONTRACTOR TO NOTIFY OWNER AND BARGHAUSEN CONSULTING ENGINEERS, INC., OF ANY VARIATION IN STATIC PRESSURE OVER 5 PSI GREATER/LESS THAN DESIGN PRESSURE.
   D. INSTALLATION OF SLEEVING AS INDICATED ON PLANS.
10. ALL WORK PER LOCAL CODES. INSTALLATION PER MANUFACTURER'S WRITTEN SPECIFICATIONS.
11. ALL VALVES TO BE PLACED IN "CARSON" GRADE LEVEL BOXES WITH BOLT-LOCK LIDS (OR APPROVED EQUIVALENT). SET BOXES 3-INCHES HIGHER THAN FINISH GRADE.
12. MAINLINE PIPE TO BE BURIED 30 INCHES AND LATERALS 12 INCHES BELOW FINISH GRADE. NO ROCK OR DEBRIS TO BE BACKFILLED OVER PIPE.
13. HEAD AND LINE POSITIONING IS DIAGRAMMATIC ON PLAN. ADJUST IN FIELD AS NECESSARY FOR ADEQUATE COVERAGE. VALVES TO BE POSITIONED ADJACENT TO CURBS, IN SHRUB BEDS WHERE POSSIBLE.
14. PROVIDE OWNER WITH TWO (2) SETS "AS-BUILT" DRAWINGS AND OPERATOR'S MANUAL UPON COMPLETION.
15. FAMILIARIZE FACILITY OPERATOR WITH IRRIGATION SYSTEM FUNCTION, CONTROLLER PROGRAMMING, SYSTEM OPERATION AND MAINTENANCE REQUIREMENTS.
16. NO SPRINKLERS ON RISERS WILL BE ALLOWED.
17. RADIUS REDUCTION TO BE MADE BY USE OF PRESSURE ADJUSTMENT, SCREENS, AND/OR ALTERNATE NOZZLES. IN-NOZZLE ADJUSTMENT IS LIMITED TO 10 PERCENT FOR SPRAY HEADS AND PER MANUFACTURER'S LIMITS FOR OTHER SPRINKLERS. SPRINKLER SPACING NOT EXCEED 60% OF THE DIAMETER OF THE PUBLISHED DATA.
18. ALL CONTROL WIRE SPLICES TO BE MADE AT VALVE BOXES WITH WATER TIGHT ELECTRICAL SPLICES, 3M, SCOTT'S LOCK SEAL TACK 3576-78, OR EQUIVALENT. SHOW ALL WIRE SPLICING ON "AS-BUILT" DRAWING.
19. CONTROL WIRING COLORS TO MATCH EXISTING WIRE COLORS.
20. ALL ELECTRICAL EQUIPMENT TO BE U.L. TESTED AND APPROVED, AND TO BEAR THE U.L. LABEL.
21. CROSS CONNECTION PROTECTION INSPECTION REQUIRED. THE BACKFLOW DEVICE TO BE TESTED UPON THE ORIGINAL INSTALLATION. THE TESTING TO BE PERFORMED BY A PERSON HOLDING A CURRENT CERTIFICATE AS A BACKFLOW TESTER. THE TEST REPORT TO BE SUBMITTED TO THE LOCAL WATER DISTRICT, OR PURVEYOR, AND OWNER WITH COPY TO BARGHAUSEN CONSULTING ENGINEERS, INC. CONTRACTOR TO INCLUDE TESTING IN THE SCOPE OF WORK. OWNER IS RESPONSIBLE FOR ANNUAL INSPECTIONS AFTER THE INITIAL INSPECTION.
22. IRRIGATION SCHEDULING:
    COORDINATE IRRIGATION SCHEDULE WITH OWNER AND SITE LANDSCAPE MAINTENENCE COMPANY
23. SUBSTITUTION OF IRRIGATION MATERIAL/EQUIPMENT TO BE MADE ONLY UPON WRITTEN APPROVAL OF OWNER'S REPRESENTATIVE.
24. ALL ZONES TO PASS A MINIMUM DISTRIBUTION UNIFORMITY OF 62 PERCENT, AS TESTED THROUGH AS IRRIGATION ASSOCIATION CERTIFIED WATER AUDIT.
25. EXISTING IRRIGATION INFORMATION IS BASED ON DRAWINGS BY DAVID BABCOCK AND ASSOCIATES, LAFAYETTE, CALIFORNIA, PERMIT SUBMITTAL DATE SEPTEMBER 4, 2003
26. MAXIMUM APPLIED WATER ALLOWANCE, ESTIMATED APPLIED WATER USE, AND ESTIMATED TOTAL WATER USE DOES NOT CHANGE FROM THE FIGURES NOTED OF THE ORIGINAL DESIGN DRAWINGS BY DAVID BABCOCK AND ASSOCIATES, PERMIT SUBMITTAL DATE SEPTEMBER 4, 2003.
27. IRRIGATION IMPROVEMENTS ARE BEING CONNECTED TO EXISTING OPERATING SYSTEM. NO NEW BACKFLOW DEVICE SPECIFIED. CONTRACTOR TO INSPECT AND VERIFY EXISTING DEVICES FOR COMPLIANCE WITH CURRENT CODES. PROVIDE OWNER WITH SCOPE AND RELATED COSTS FOR ALL NECESSARY UPGRADES.



NOTE:
DIMENSIONS ARE MIN. CLEARANCES.
ALL IRRIGATION SLEEVING TRENCH BACKFILL MATERIAL TO BE CLASS "B" OR BETTER (MAX. OF 10% PASSING NO.40 SCREEN) AND BE COMPACTED TO MIN. 95% OPTIMUM DENSITY PER ASTM D-1557-70 (MODIFIED PROCTOR)

SLEEVE/TRENCHING DETAIL

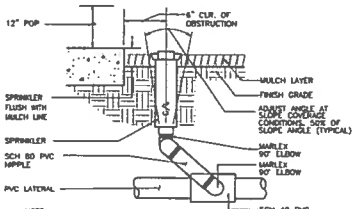
NOT TO SCALE



NOTE:
PROVIDE EXTRA COILS (18") OF EACH WIRE IN VALVE BOX
TAPE WIRE TOGETHER EVERY 20 FT.
MIN. 6" DEPTH, 7/8" WASHED GRAVEL UNDER EACH VALVE
COMPACT SOIL AROUND VALVE BOX
USE TEFLON OR FLOWABLE SEALANT IN ALL THREADED FITTINGS, PER MANUFACTURES SPEC'S.

REMOTE CONTROL VALVE ASSEMBLY

NOT TO SCALE



NOTE:
MANUFACTURER'S LIMITS PREVAIL FOR INSTALLATION AND ADJUSTMENTS.
PROVIDE SWING JOINT RISERS AT WALKS AND CURBS.
24" FLEXIBLE RISERS ACCEPTABLE ELSEWHERE.

POP-UP RISER ASSEMBLY

NOT TO SCALE

No.	Date	By	Chk.	Appr.	Revision
4	10/06/15	MPG	CUT	MPG	LAND USE SUBMITTAL
3	08/07/15	MPG	CUT	MPG	LAND USE SUBMITTAL
2	11/07/13	MPG	CUT	MPG	PER PLANCHECK
1	03/07/13	MPG	CUT	MPG	PER PLANCHECK

Title: LANDSCAPE IRRIGATION NOTES AND DETAILS
2400 MONUMENT BOULEVARD
CONCORD, CA 94518
COSTCO GASOLINE FACILITY #663

For: COSTCO GASOLINE
COSTCO WHOLESALE
999 LAKE DRIVE
ISSAQUAH, WA 98027

REGISTERED LANDSCAPE ARCHITECT
MICHELE L. KOSS
5418
09/07/15
STATE OF CALIFORNIA

(PLAN ONLY WITH SUBMITTAL)

Scale: Horizontal N/A; Vertical N/A

Designed MPG; Drawn MPG; Checked CUT; Approved MPG; Date 3/06/14

BARGHAUSEN CONSULTING ENGINEERS
18215 72ND AVENUE SOUTH
KENT, WA 98032
(425)251-6222
(425)251-8762 FAX
CIVIL ENGINEERING, LAND PLANNING, SURVEYING, ENVIRONMENTAL SERVICES

Job Number: 7340
Sheet: L4 of 4

File:P:\07\663\7340\engineering\2014 Design Engineering\7340-L3-4.dwg Date/Time:3/3/2015 1:50 PM Scale:1" = 1' ESTIMATED Ref: ----

EXHIBIT D

BEFORE THE PLANNING COMMISSION
OF THE CITY OF CONCORD,
COUNTY OF CONTRA COSTA, STATE OF CALIFORNIA

A RESOLUTION APPROVING AND ADOPTING AN ADDENDUM TO THE 1999 COSTCO WHOLESALE PROJECT ENVIRONMENTAL IMPACT REPORT (EIR 1-99) AND APPROVING AN APPLICATION FOR A USE PERMIT AMENDMENT AND DESIGN REVIEW FOR THE COSTCO FUELING FACILITY EXPANSION (PL131129-UA, DR)

Resolution No. 15-04 PC

WHEREAS, on December 14, 1999, pursuant to City Council Resolution No. 99-119, the City of Concord City Council ("City Council") certified the 1999 Costco Wholesale Environmental Impact Report (EIR 1-99), adopted a Statement of Overriding Considerations, and incorporated Mitigation Measures and Mitigation Monitoring Program as a condition of project approval for the construction of a retail warehouse and gas station ("1999 Project"); and

WHEREAS, the 1999 EIR was prepared and circulated pursuant to Public Resources Code § 21000, et seq., as amended and implementing State CEQA Guidelines, Title 14, Chapter 3 of the California Code of Regulations (collectively, "CEQA"). The 1999 Project, the 1999 EIR and the associated Mitigation and Monitoring Program ("MMP") were considered by the Planning Commission on November 17, 1999 (Planning Commission Resolution No. 99-1) and were certified and adopted by the Concord City Council on December 14, 1999 (City Council Resolution No. 99-119) along with a Statement of Findings that potential impacts would be reduced to less-than-significant levels, except for one significant and unavoidable impact on the environment related to regional emissions. A Statement of Overriding Considerations was adopted by the Council finding that the benefits of the 1999 Project outweighed the one significant unavoidable environmental impact. The MMP, the Statement of Findings, and the Statement of Overriding Considerations are included within the definition of "1999 EIR."

WHEREAS, subsequent to the construction of the 1999 Project, the City approved a fourth fueling island (UP 2-01), garden center and receiving dock addition (ZA 07-016), and employee-only parking lot (ZA 11-010); and

WHEREAS, the subsequent projects were categorically exempt from CEQA and constructed; and

WHEREAS, the 1999 Project and subsequent projects are hereafter collectively referred to as the "Approved Project"; and

WHEREAS, on July 15, 2013, Costco filed a Use Permit Amendment and Design Review application to construct a new fueling island with three additional multi-product fuel dispensers and related improvements; and

WHEREAS, on April 30, 2015, Costco revised its application and project scope to consist of the following improvements: 1) the addition of one multi-product dispenser (MPD) on the entry side of all four existing fueling islands, resulting in eight additional fueling positions, 2) a 36-foot by 120-foot fueling island canopy addition (approximately 4,320 square feet) to provide weather protection for the MPDs, 3) the installation of one, 20,000-gallon diesel product underground storage tank (UST), 4) installation of one, 3,500-gallon gasoline/diesel split additive UST, and associated product piping, and 5) the removal of five parking stalls for the addition of an 800 square foot water quality bio-retention area; and

WHEREAS, on May 5, 2015, the application was deemed complete; and

WHEREAS, the subject proposal/project (referred to herein as the "2015 Project") does not make substantial changes to the Approved Project or substantial changes with respect to the circumstances under which the Approved Project would be undertaken which would require revisions to the 1999 EIR due to new significant environmental effects or a substantial increase in the severity of previously identified significant effects and there is no new information that would require preparation of a subsequent or supplemental EIR under CEQA Guidelines Section 15162; and

WHEREAS, as only minor technical changes or additions were required to the 1999 EIR, an Addendum ("Addendum", attached hereto as Attachment C and incorporated by reference) was prepared in accordance with all legal requirements, including CEQA Guidelines Section 15164; and

WHEREAS, the Planning Commission, after giving all public notices required by State law and the Concord Municipal Code, held a duly noticed public hearing on June 3, 2015, on the 2015

Project; and

WHEREAS, at such public hearing, the Planning Commission considered all oral and written information, testimony, and comments received during the public review process, including information received at the public hearing, the oral report from City staff, the written report from City staff dated June 3, 2015, application materials, exhibits presented, pertinent maps, plans, reports, studies, memoranda, the Addendum, the 1999 EIR, the application of all mitigation measures, adopted City documents relating to the Approved Project, the Project site, and the 2015 Project (including the City's General Plan, Municipal Code, Development Code, applicable City laws and regulations, and all associated approved and certified environmental documents), and all other information contained in the record of proceedings and the City's files relating to the Approved Project and the 2015 Project, which are maintained at the offices of the City of Concord Planning Division (collectively, "Project Information") in accordance with the applicable law, including the requirements of CEQA and the City of Concord Municipal Code; and

WHEREAS, the applicant is required and has agreed to incorporate in the 2015 Project all applicable mitigation measures identified in the 1999 EIR, to reduce environmental impacts to less than significant level; and

WHEREAS, on June 3, 2015, the Planning Commission considered the 1999 EIR and the Addendum in accordance with the requirements of CEQA; and

WHEREAS, after consideration of all the Project Information, including all pertinent plans, documents and testimony, the Planning Commission declared their intent to approve the project, subject to the Conditions of Approval contained herein as Attachment A.

NOW, THEREFORE, BE IT RESOLVED AS FOLLOWS:

Recitals

1. The Planning Commission finds that the above recitals are accurate and constitute findings in this matter and, together with the Project Information, serve as an adequate and appropriate evidentiary basis for the findings and actions set forth in this Resolution, and further makes the following findings:

Addendum

2. Based on the Project Information, and all oral and written testimony submitted on this item, the Planning Commission makes the findings set forth below with respect to the Addendum:

a. The Addendum was prepared in accordance with all legal requirements, including CEQA Guidelines section 15164.

b. The Planning Commission has reviewed, considered, and evaluated all of the Project Information prior to acting upon or approving the 2015 Project.

c. The Addendum reflects the independent judgment and analysis of the City as the lead agency for the project.

d. Based on substantial evidence in the whole record before the City, the 2015 Project does not make substantial changes to the Approved Project or substantial changes with respect to the circumstances under which the Approved Project would be undertaken which would require revisions to the 1999 EIR due to new significant environmental effects or a substantial increase in the severity of previously identified significant effects and there is no new information that would require preparation of a subsequent or supplemental EIR under Public Resources Code Section 21166 or CEQA Guidelines Section 15162. Therefore, none of the elements set forth in Public Resources Code Section 21166 or CEQA Guidelines Section 15162 exist and a subsequent or supplemental EIR or negative declaration is not required.

e. No substantial changes have occurred with respect to Air Quality that would cause new or substantially more severe significant environmental effects than were identified in the 1999 EIR, all mitigation measures will remain in place and continue to be enforced, and the Statement of Overriding Considerations remain in effect.

f. As only minor technical changes or additions were required to the 1999 EIR, the Addendum was prepared in accordance with all legal requirements, including CEQA Guidelines Section 15164.

g. The mitigation measures described in the 1999 EIR are within the jurisdiction of the City to adopt, and will be implemented by the applicant.

h. All feasible mitigation measures for the Project identified in the 1999 EIR are hereby incorporated into this resolution.

3. The Planning Commission hereby approves and adopts the Addendum and reaffirms the Statement of Overriding Considerations.

4. The documents and other materials that constitute the record of proceedings upon which the Planning Commission has based its decision are located in and may be obtained from the City of Concord Planning Division, 1950 Parkside Drive MS/53, Concord, CA 94519.

Use Permit Amendment and Design Review

5. Based on the Project Information, and all oral and written testimony submitted on this item, the Planning Commission makes the findings set forth below with respect to the Use Permit Amendment:

a. *The proposed use is allowed within the applicable Zoning District and complies with all other applicable provisions of the Development Code and the CMC.* Gas Station is a conditionally allowed use under the property's RC (Regional Commercial) zoning. The project includes a Use Permit Amendment as required by the Development Code to expand the existing Gas Station use. The project meets all applicable RC zoning and development standards related to building setback, building height, and parking as explained in this report and Table 2. The project meets all applicable standards for gas stations set forth in Development Code Section 18.200.090, including setbacks requirements for fueling islands and screening of vapor processing units.

b. *The proposed use is consistent with the General Plan and any applicable Specific Plan.* The subject property is designated as Regional Commercial by the General Plan. This designation is intended for large-scale commercial development serving both local and regional residents. A broad range of retail uses and personal services are envisioned including "warehouse membership clubs" and "travel-related services such as…gas stations." There is no Specific Plan that applies to the project site. Additionally, the project is consistent with General Plan policies encouraging region-serving businesses to be competitive by offering a

wider variety of products with the addition of diesel fuel (Policy LU-3.1.2) and to expand or adapt to market changes through reuse, rehabilitation, and infill development (Policy LU-3.1.3).

c. *The design, location, size, and operating characteristics of the proposed activity are compatible with the existing and future land uses in the vicinity.* The design, location, size and operating characteristics of the project are compatible with existing uses in the vicinity, which include gas stations, automotive service, and other automobile-related uses. The project is compatible with existing development because it would merely expand a gas station while maintaining current operational characteristics including business hours, site circulation, and aesthetics. Additionally, the expansion is internal to the site and would not impact any existing or future land uses in the vicinity.

d. *The site is physically suitable for the type, density, and intensity of the proposed use, including access, utilities, and the absence of physical constraints.* The project proposes a minor expansion that will not significantly alter the type, density and intensity of the existing fueling facility. The site is adequately served by access and utilities, and does not have any physical constraints.

e. *Granting the permit would not be detrimental to the public health, safety, or welfare of the persons residing or working in the subject neighborhood or materially detrimental or injurious to property or improvements in the vicinity and Zoning District where the property is located.* The project would expand an existing use that is consistent with the General Plan and allowed by zoning. The project is also compatible with commercial uses in the vicinity, including auto-related services and gas stations. Moreover, the proposed improvements are located away from neighboring properties and thus will not be materially injurious to nearby properties or improvements.

6. Based on the Project Information, and all oral and written testimony submitted on this item, the Planning Commission makes the findings set forth below with respect to the Design Review:

a. The project is consistent with the General Plan.

b. The project meets the criteria in Development Code Section 122-908 (Design Criteria) of the Development Code, in that:

i. Lighting and fixtures are designed to complement existing gas canopy lighting, and will be required to meet City photometric standards to ensure adequate light is provided for safety and security while minimizing scale;

ii. Mechanical, electrical, and utility equipment such as vent risers will be located so as not to be visible from off-site or screened to the extent practicable with landscaping;

iii. The project involves a minor expansion to the gas canopy and will maintain the overall look of the existing facility, including its scale, massing, site plan, exterior design, and landscaping;

iv. The project design is appropriate to the function of the project and will provide an attractive and comfortable environment for occupants, visitors, and the general community.

v. The canopy addition details, colors, materials, will match the existing canopy for aesthetic and visual consistency.

vi. The project does not significantly increase the scale of the existing gas canopy structure and will continue to provide a harmonious transition between the project and surrounding development.

vii. New landscaping will be compatible with and enhances the architectural character of the gas station, and blends with the surrounding landscape.

viii. Stormwater treatment areas have been integrated into the landscaping.

c. The project is consistent with all applicable criteria under the Community Design Guidelines, and Downtown Concord Urban Design Guidelines, adopted by the City Council as follows:

i. The gas canopy addition will maintain the scale and character of the existing fueling facility and thus will not be drastically different in scale and character relative to neighboring sites.

ii. The design, materials and colors of the gas canopy addition will match existing

colors and materials and will continue to be compatible with neighboring buildings, including nearby gas stations and automotive services that have similar canopy features.

iii. The project proposes minimal changes to the site plan and will continue to have a functional relationship with respect to the streetscape and on-site circulation/

v. All sides of the gas canopy are treated with the same quality of design and materials.

vi. The project will comply with Consolidated Fire Protection District's emergency access requirements.

vii. Exterior lighting levels will be limited to the minimum necessary subject to City review and approval of a photometric plan.

viii. Retaining walls visible from the exterior of the project will be designed with durable materials compatible with the design of the building.

ix. The project provides amenities such as a swimming pool, club room, outdoor barbecue areas, and guest parking to enhance the quality of life for residents.

x. Building mass and scale is minimized by articulating vertical elements with color, offsets, and varying rooflines to create the appearance of individual buildings clustered together instead of a single monolithic building.

7. The Planning Commission does hereby approve the Use Permit Amendment and Design Review application (PL131129-UA, DR) subject to the Conditions of Approval.

<u>Measure J</u>

8. The project supports the following Growth Management Element policies and is therefore compliant with Measure "J".

i. Policy GM-1.1.1 because the project is an urban development located within the City's Urban Limit Line.

ii. Policy GM-2.1.1 because the project results in urban infill development.

iii. Policies GM-7.2.1 through GM-7.2.3 because the project's impact on public services and facilities are reduced by mitigation measures under the 1999 EIR, as well as by payment

of impact fees proportionate to the project's demand on public services and facilities.

Effective Date

In accordance with Municipal Code Section 18.500.080, approvals or other decisions of the Planning Commission shall become effective on the 11th calendar day following the date the decision is rendered, if no appeal is filed.

PASSED AND ADOPTED this June 3, 2015, by the following vote:

AYES:

NOES:

ABSTAIN:

ABSENT:

Laura Simpson
Secretary to the Planning Commission

Attachments:
A – DRAFT Conditions of Approval
B – 1999 EIR
C – Addendum

cc: Kevin Marstall, Senior Civil Engineer
Robert Woods, Chief Building Official
Contra Costa County Fire Protection District

DRAFT CONDITIONS OF APPROVAL
COSTCO FUELING FACILITY EXPANSION
PL131208-UP-DR
2400 MONUMENT BLVD.
APN: 129-040-010

NOTE: Changes and additions to Standard Conditions are highlighted in bold.

PERMIT DESCRIPTION

1. These Conditions apply to and constitute the approval of a **Use Permit Amendment** to add four multi-product fuel pumps, including diesel product, to an existing gas station.

2. These Conditions apply to and constitute approval of **Design Review** to modify an existing gas canopy and new landscaping.

3. The **Mitigation Monitoring Plan** (MMP) adopted by ***PC Resolution No. 99-1*** for ***EIR 1-99, RZ 3-99, and PDP 5-99,*** as required by CEQA, is incorporated by reference. If there is an inconsistency between the Conditions of Approval and the MMP, the MMP shall govern. ***(PLNG, ENGR, TRANS)***

4. The following Exhibits, date stamped received by the City of Concord, on October 9, 2013, are approved and shall be incorporated as Conditions of Approval.

Plan	Date Prepared	Prepared by	Sheet
Concept Site Plan	May 4, 2015	MulvannyG2	DD11-12
Enlarged Site and Demolition Plans	May 4, 2015	MulvannyG2	DD11-12A
Elevations	May 4, 2015	MulvannyG2	DD11-12B
Civil Plans Cover Sheet	March 20, 2015	Barghausen	C1
Demolition and Erosion Control	March 20, 2015	Barghausen	C2
Site and Horizontal Control	March 20, 2015	Barghausen	C3
Grading and Utility	March 20, 2015	Barghausen	C4
Construction Notes and Details	March 20, 2015	Barghausen	C5-C6
Landscape Plan	March 2, 2015	Barghausen	L1-L4

GENERAL CONDITIONS

5. The Conditions are the responsibility of the applicant and all contractors. Compliance shall occur as specified in the Conditions or at one of the following project milestones:

   (a) With the submittal of Grading, Improvement, Landscape, or Building Plans.
   (b) Prior to issuance of Encroachment, Grading, or Building Permits, whichever comes first.
   (c) Prior to Construction.
   (d) On going during Construction.
   (e) Prior to approval of the Final Map.
   (f) Prior to occupancy approval.

   If timing for compliance is not specified, it shall be determined by the Divisions listed after the Condition. ***(PLNG, BLDG, ENGR)***

6. Where a plan or further information is required, it is subject to review and approval by the applicable City Department/Division, as noted at the end of each Condition. The Division listed first shall be the primary contact for implementation of that Condition. ***(PLNG, BLDG, ENGR)***

7. The project shall comply with all applicable Federal and State laws and Concord Municipal Code (CMC) requirements. ***(PLNG, BLDG, ENGR)***

8. Minor modifications that are found to be in substantial conformance with the approved plans such as colors, plant materials, or minor lot line adjustments, may be approved administratively. Major modifications shall be approved by the applicable decision making body. ***(PLNG, ENGR)***

9. The Conditions of Approval and Mitigation Measures shall be listed on a plan sheet that is included in the construction plan set (Grading, Utility, Landscape and Building Plans). ***(PLNG, ENGR)***

10. Two annotated copies of the Conditions of Approval specifying how each applicable condition has been satisfied, shall be submitted as follows:

    a. At the time Grading, Utility, Landscape, and/or Building Plans are submitted for plan check, whichever comes first.
    b. Prior to occupancy approval. ***(PLNG, ENGR)***

ARCHITECTURAL

11. Vents, gutters, downspouts, flashing, electrical conduits, etc., shall be painted to match the color of the adjacent surface, unless otherwise approved by the Planning Division. ***(PLNG)***

LANDSCAPING

12. Submit Final Landscape Plans prepared by a Landscape Architect, registered by the State of California, for review and approval with the Grading, Improvement, or Building Plans, whichever comes first. The Plan shall be drawn on or consistent with the Grading, Improvement, Utility, and Stormwater Plans prepared by the Civil Engineer, with the following information:

    a. A legend that lists all plant species (Latin and common name), including size, quantities, spacing, and ultimate height and width.
    b. Specifications and details for planting, including staking of trees and planting in bio-retention or other stormwater treatment areas. Plants for bio-retention facilities should be compatible with temporarily flooded conditions.
    c. Utility and Grading information on the base map, screened back.
    d. Existing Heritage trees to be saved and identification of all replacement trees.
    e. Trees (minimum size 24-inch box) and shrubs (minimum 5-gallon; accent or sub-shrubs may be 1-gallon).

f. Root control barriers and four-inch perforated pipes for parking lot trees, street trees, and trees within 6 inch of any paved area or curb.

g. Six-inch vertical concrete curbs around landscaped areas. ***(PLNG/ENGR)***

13. Submit a Project Landscape Application (PLA) prepared by a Landscape Architect, registered by the State of California, for review and approval with the Grading, Improvement, or Building Plans, whichever comes first. The PLA shall be prepared in accordance with the requirements under Section 18.170.040 of the Concord Development Code. ***(PLNG)***

14. All landscaping shall be installed prior to occupancy approval. Contact the Planning Division at least two weeks prior to Occupancy, to request a site inspection of all exterior improvements including buildings, driveways, parking lots, landscaping, irrigation, signs, lighting, walls, fences, and trash enclosures. ***(PLNG)***

15. Any vegetation damaged or destroyed by construction activities shall be replaced with like or comparable plant materials, and if damage occurs off-site, the replacement plants shall be approved by the property owner and the Planning Division, prior to occupancy approval. ***(PLNG)***

LIGHTING

16. Show all exterior lighting including: building fixtures, walkway lighting, parking lot lighting, and street lights on the Site, Utility, Landscape, and Building Plans, prior to the issuance of any permits. The height and style of fixtures shall be shown. Energy-saving fixtures shall be used and noted on the plans. ***(PLNG, ENGR, BLDG)***

17. All exterior building and parking lot lighting shall provide illumination for safety and shall be installed in a manner that is glare shielded and directed away from adjacent properties and right-of-ways. ***(PLNG)***

18. Submit a Photometric Plan for review and approval, showing the location of all light sources, streetlight spacing, intensity of luminance, and uniformity ratio, in accordance with the City's specifications, with the Improvement, Utility, or Building Plans, whichever comes first. ***(TRANS, PLNG)***

SIGNAGE

19. All signage shall comply with the City of Concord Sign Ordinance. ***(PLNG)*** **CMC**

PARKING

20. All parking spaces shall be striped; full-size spaces shall be 9 ft. by 19 ft.; compact spaces shall be 8 ft. by 16 ft. Wheel stops shall be provided, except when parking spaces abut a concrete curb for a landscaped planter, then a two foot overhang is allowed. ***(PLNG, ENGR)*** **CMC**

21. A maximum of 25 percent of the required parking spaces may be compact. Compact stalls shall be clearly identified. ***(PLNG, ENGR)*** **CMC**

22. Any vehicle that identifies a business by way of signage that is painted on or applied to the vehicle shall be parked in a delivery or storage area at the rear of the building or in an area screened from view from adjacent public right-of-way. ***(PLNG)***

STREET IMPROVEMENTS

23. Any trenching for underground utilities shall comply with the modified City Standard Detail S-17 for pavement repair and possible slurry placement. ***(ENGR)***

24. Construct all public facilities in accordance with the current Americans with Disabilities Act (ADA), including driveways and curb ramps. ***(ENGR)***

NOISE

25. Pursuant to Mitigation Measure 4.7-5 of the 1999 EIR, construction activity shall be limited to the hours of 7:00 a.m. and 6:00 p.m. with no construction activity on Sundays or holidays without prior written approval by the Chief of Planning.

    A contact person shall be available during all construction activities in the evening and on weekends to respond to complaints and take actions necessary to reduce noise. ***(BLDG, ENGR, PLNG)***

CONSTRUCTION ACTIVITIES

26. Contact Engineering Services to arrange for a Pre-Construction Meeting prior to issuance of Grading or Building Permits, whichever comes first. ***(ENGR)***

27. Implement a dust and construction noise control plan. Submit the plan to Engineering Services for review and approval prior to issuance of the Grading Permit. ***(ENGR)***

28. Construction equipment shall not be serviced at the site at any time. During construction no deliveries shall be made to the site and no delivery vehicles (including gasoline tanker trucks) shall enter the site between 6:00 p.m. and 7:30 a.m. on weekdays, and between 5:00 p.m. and 8:00 a.m. on weekends and federal holidays. Delivery vehicles shall have their engines turned off during unloading. ***(BLDG, ENGR, PLNG)***

29. Employ the quietest construction equipment available, to muffle noise from construction equipment and keep all mufflers in good working order in accordance with State law. ***(BLDG, ENGR, PLNG)***

30. Implement the following measures during construction:

    a. Gather all construction debris on a regular basis and place them in a dumpster or other container that is emptied or removed on a weekly basis. When appropriate, use tarps on

the ground to collect fallen debris or splatters that could contribute to storm water pollution.

b. Remove all dirt, gravel, rubbish, refuse, and green waste from the street pavement, and storm drains adjoining the project site. During wet weather, avoid driving vehicles off paved areas.

c. Broom sweep the public street pavement adjoining the project site on a daily basis. Caked-on mud or dirt shall be scraped from these areas before sweeping.

d. Install filter materials (e.g., sandbags and filter fabric) at the storm drain inlet nearest the downstream side of the site in order to preclude any debris or dirt from flowing into the City storm drain system. Filter materials shall be maintained and/or replaced as necessary to ensure effectiveness and to prevent street flooding. Dispose of filter particles in an approved trash receptacle.

e. Create a contained and covered area on the site for the storage of bags, cement, paints, flammable, oils, fertilizers, pesticides, or any other materials used on the site that have the potential for being discharged to the storm drain system by being windblown or in the event of a material spill.

f. Never clean items such as machinery, tools, and brushes or rinse containers in a street, gutter, or storm drain.

g. Ensure that concrete, gunite, plaster, or similar supply trucks do not discharge wash water into street gutters or drains. ***(ENGR, BLDG)***

31. No equipment shall be started or staging area be established on the streets or the site before or after the specified hours of construction. ***(ENGR, BLDG)***

32. Ensure that no debris or construction scrap material is placed on any adjoining lot, open space area, or street, and that any such material stored on an adjoining site shall be completely removed and the site cleaned, prior to occupancy approval. ***(ENGR, BLDG)***

33. At no time shall campers, trailers, motor homes, or any other vehicle be used as living or sleeping quarters on the construction site unless authorized for site security. ***(ENGR, BLDG)***

34. There shall be no parking of construction equipment or construction worker's vehicles on residential streets at any time; all vehicles shall be maintained on-site. ***(ENGR, BLDG)***

35. Portable toilets used during construction shall be kept as far as possible from adjacent properties and shall be emptied on a regular basis as necessary to prevent odor. ***(ENGR, BLDG)***

36. Identify truck routes for the import or export of cut/fill material and/or construction debris for review and approval by the City Engineer prior to the issuance of permits. Repair any damage to City streets (private and public) caused by activity associated with this project. ***(ENGR)***

37. In the event of the encounter of subsurface materials suspected to be of an archaeological or paleontological nature, all grading and/or excavation shall cease, the find shall be left untouched, and the City Planning Division shall be immediately notified. The County Coroner and the Native American Heritage Commission shall also be notified and the procedures required in CEQA §15064.5 shall be followed. This requirement shall be noted on the Grading and Building Plans, prior to issuance of permits. ***(PLNG, ENGR, BLDG)***

38. In the above event, retain a qualified professional archaeologist certified by the Register of Professional Archaeologists or paleontologist with a degree(s) in paleontology or geology, to evaluate and make recommendations as to disposition, mitigation and/or salvage. The recommendation shall be implemented before work may proceed. The applicant shall be responsible for all costs associated with the professional investigation and implementation. ***(PLNG, ENGR, BLDG)***

CONSTRUCTION PLAN REVIEW/PRE-PERMIT REQUIREMENTS

39. Submit two copies of Preliminary Title Report, prepared within three months prior to plan submittal. ***(ENGR)***

40. Design improvements in accordance with the City Standard Plans S-34 and S-36 for sight distance, sidewalk, back up, fencing, geometrics at intersection and corner setback requirements, prior to the Acceptance of Improvements. Plans shall be subject to review and approval by Engineering Services. ***(ENGR)***

41. Obtain an Encroachment Permit from the City prior to performing any work within the public right-of-way or public easements. ***(ENGR) CMC***

GRADING/EROSION CONTROL/GEOLOGIC

42. Submit a Geotechnical Report with the Grading Plans and Building Plans, pursuant to CMC Section 16.10.030 that addresses and provides recommendations for grading, drainage, walls, building foundations, and pavement structural sections. ***(ENGR)***

43. All grading shall require a Grading and Drainage Plan prepared by a registered Civil Engineer, a Soils Report prepared by a registered Geotechnical Engineer and receipt of a Grading Permit approved by the City Engineer. The Grading Plans and Soils Report shall require review by the City's Geotechnical consultant with all costs to be borne by the applicant. ***(ENGR)***

44. Contour grading techniques shall be employed throughout the project to achieve a more natural appearance, even where this will increase the amount of grading. Tops of cuts or toes of fills adjacent to existing public rights-of-way or easements shall be set back two feet minimum from said rights-of-way and easements. All cut-and-fill slopes in excess of five feet in height shall be rounded both horizontally and vertically. ***(ENGR)***

45. Grading on adjacent properties shall require written approval from the affected property owners. ***(ENGR)***

46. On-site finish grading work shall require drainage to be directed away from all building foundations at a minimum slope of 2 percent and a maximum slope of 20 percent toward approved drainage facilities or swales. Non-paved drainage swales shall have a minimum slope of 1 percent. ***(ENGR)***

47. The project engineer shall inspect the finished grading and certify that it conforms to the compaction and elevations shown on the Grading Plan and Soils Report. ***(ENGR) CMC***

48. At all times seasonally appropriate erosion control measures shall be implemented per plans approved by the City Engineer for all grading work at all times. Wet season measures shall be in place October through April at a minimum and when rain is otherwise predicted. At the time of approval of the Improvement and/or Grading Plans, an approved Erosion Control Plan prepared by a registered Civil Engineer shall be filed with the City Engineer. ***(ENGR)***

49. All graded slopes and stockpiles of loose soil shall be hydromulched/hydroseeded by October of any given year. During grading work between October and April, if rain is forecast, stop all grading work two days before the rain forecast and implement BMPs to insure that the site is protected from erosion. ***(ENGR)***

50. Submit plans for Grading, Erosion Control, Improvement, Stormwater Control, and State Waste Discharge Identification (WDID) number verifying submittal of Stormwater Pollution Prevention Plan (SWPPP) to Engineering Services for review and approval prior to the issuance of Grading, Encroachment, and Building Permits. Where applicable, evidence of compliance with the State General Construction Permit shall be provided. ***(ENGR) CMC***

51. Comply with the applicable provisions of the Grading Ordinance and the Storm Water Management and Discharge Control Ordinance. ***(ENGR) CMC***

UTILITIES

52. New electrical transformers shall be placed underground or screened from view. ***(PLNG, ENGR)***

53. No above ground utility facilities/structures shall be located between the face of curb and back of sidewalk in the public right-of-way. ***(ENGR)***

54. All new utilities shall be constructed underground prior occupancy approval. ***(ENGR)***

55. Comply with the City of Concord sewer design flow criteria and sewer construction requirements of the Central Contra Costa Sanitary District. ***(ENGR)***

56. Any property presently served by sewer line shall be provided a side sewer connected to the sewer system with no interruption of service. The existing sewer lateral(s) to maintain shall be tested under City's observation before connection and replacement if failed. ***(ENGR)***

57. Coordinate all facility adjustments, relocations, or additions to utility services with the appropriate utility companies. ***(ENGR)***

58. Utility areas, electrical and gas meters shall be architecturally screened from view. ***(PLNG)***

59. The location of all outdoor, above-ground and/or at-grade pad mounted transformers, utility equipment, electrical and gas meters, vaults, irrigation control boxes, back flow prevention

devices, and the like shall be subject to approval by Planning and Engineering Services prior to the issuance of the Grading or Building Permit, whichever comes first. All such equipment shall be screened from view either architecturally or with landscaping and painted forest green or other approved color as approved by the Planning Division. Any changes to the approved Utility Plans, including location or screening details shall be reviewed and approved by the Planning Division. ***(PLNG, ENGR)***

60. Provide cable companies a set of approved site diagrams in electronic format showing the joint trench layout for dry utilities for cable service to be provided to the site. ***(ENGR)***

61. Connect all buildings to the sanitary sewer collection facilities of the City, and pay all current sewer connection and service fees prior to occupancy approval. ***(ENGR) CMC***

62. Submit proof acceptable to Engineering Services that all work within the existing (new) private waterline easement(s) are reviewed and approved by the easement owner of record. ***(ENGR)***

DRAINAGE/STORMWATER C.3 REQUIREMENTS

63. Submit a Stormwater Control Plan (SWCP) prepared in accordance with the current Contra Costa Clean Water Program Stormwater C.3 Guidebook for review and approval by Engineering Services prior to issuance of any permit. The SWCP shall be prepared and certified by a Civil Engineer, registered in the State of California, demonstrating an understanding of the design of treatment measures for water quality and groundwater protection principles applicable to the project site. ***(ENGR)***

64. Prior to issuance of permits for building, site improvements, or landscaping, applicant shall submit a permit application consistent with the applicant's approved Stormwater Control Plan (SWCP), and include drawings and specifications necessary for construction of site design features, measures to limit directly connected impervious area, pervious pavements, self-retaining areas, treatment BMP's, permanent source control BMP's, and other features that control stormwater flow and potential stormwater pollutants. The Contra Costa Clean Water Program permit application shall include a completed "Construction Plan C.3 Checklist" as described in the Stormwater C.3 Guidebook, and a detailed draft Stormwater BMP Operation and Maintenance Plan consistent with the general O&M plan included in the applicant's approved Stormwater Control Plan. Guidelines for the preparation of Stormwater BMP Operation and Maintenance Plans are in Appendix F of the Stormwater C.3 Guidebook. ***(ENGR)***

65. Construct stormwater treatment measures per the approved SWCP prior to occupancy approval. ***(ENGR)***

66. Submit a final Stormwater BMP Operation and Maintenance Plan (O&M Plan) in accordance with City of Concord Guidelines, for review and approval by Engineering Services, prior to occupancy approval. This O&M Plan shall incorporate City comments on the draft O&M Plan and any revisions resulting from changes made during construction. The implementation of the O&M Plan shall be the responsibility of the property owner or the HOA where one exists. ***(ENGR)***

67. Execute O&M agreements for improvements outlined in the SWCP which pertain to the transfer of ownership, right-of-entry for inspection or abatement, and/or long-term maintenance of stormwater treatment or hydrograph modification BMPs, prior to issuance of Encroachment or Grading permit, whichever comes first. ***(ENGR)***

68. Prevent site drainage from draining across sidewalks and driveways in a concentrated manner. ***(ENGR)***

69. Collect and convey all stormwater entering and/or originating from the site to an adequate downstream drainage facility. Submit hydrologic and hydraulic calculations for a 10-year storm with the Improvement Plans to Engineering Services for review and approval. The pre- and post-construction flow shall remain the same. ***(ENGR)***

70. Install City of Concord "No Dumping, Drains to Creek" curb marker (English and Spanish version) on all catch basins. ***(ENGR)***

71. Submit a Construction Best Management Practice (BMP) Program for review and approval by the Engineering Development Services Department prior to issuance of a Building and/or Grading Permit. The general contractor and all subcontractors and suppliers of materials and equipment shall implement these BMPs. Construction site cleanup and control of construction debris shall also be addressed in this program. Failure to comply with the approved construction BMP may result in the issuance of correction notices, citations, or a project stop work order. ***(ENGR)***

72. Sweep or vacuum the parking lot(s) a minimum of once a month and prevent the accumulation of litter and debris on the site. Corners and hard to reach areas shall be swept manually. If sidewalks and/or the parking lot are pressure washed, debris must be trapped and collected to prevent entry into the storm drain system. No cleaning agent may be discharged into the storm drain. If any cleaning agent or degreaser is used, wash water shall be collected and discharged to the sanitary sewer, subject to the approval of the Central Contra Costa Sanitary District). ***(ENGR)***

73. Ensure that the area surrounding the project such as the streets stay free and clear of construction debris such as silt, dirt, dust, and tracked mud coming in from or in any way related to project construction. Areas that are exposed for extended periods shall be watered regularly to reduce wind erosion. Paved areas and access roads shall be swept on a regular basis. All trucks shall be covered. ***(ENGR)***

74. Clean all on-site stormdrain facilities a minimum of twice a year, once immediately prior to October 15 and once in January. Additional cleaning may be required if found necessary by the City Engineer/Director of Building Inspection. ***(ENGR, BLDG)***

SOLID WASTE/RECYCLING

75. Comply with CMC Chapter 8.20, Article III, Construction and Demolition (C&D) Waste Recycling, commending with Section 8.20.330. ***(BLDG)***

AGREEMENTS, FEES, BONDS

76. All fees noted below are the fees currently in effect as of July 1, 2010 per the Resolution of Fees and Charges. The fees and charges are reviewed annually as part of the budget public hearing process. Fee adjustments are based on a number of factors and vary depending on the type of fee:

    Service-based fees are adjusted annually based on the San Francisco-San Jose-Oakland Area Consumer Price Index;

    Improvement based fees (also called impact fees) are adjusted annually based on Engineering News Record Construction Cost Index (San Francisco Bay Area); and the

    Parkland Fee is adjusted per Section 78-95 of the Concord Municipal Code.

    The fees become effective as of the date set forth in Exhibit A of Resolution No. 78-6042, Fees and Charges for Various Municipal Services, as most recently amended and approved by the City Council. Persons interested in how a particular fee is calculated should contact the City Department administering the fee or the Finance Department. **(ENGR)**

77. Provide a $2,000 or other cash deposit to the Planning Division to cover Condition Compliance and Mitigation Monitoring costs, at the time of submittal of plans and documents to Engineering Services or the Building Division for plan check. Planning staff's time will be charged to this deposit for work performed to implement the Conditions of Approval, from the time of project approval to occupancy approval. Mitigation Monitoring costs will be charged at cost over the life of the project mitigation requirements. The deposit will be placed in a refundable account and any unused funds will be returned upon completion. If the initial deposit is insufficient to cover actual costs, an additional deposit will be required. ***(PLNG)***

78. Pay a Document Imaging fee to reimburse the City for implementation of the Document Imaging and File Retention programs, prior to issuance of Grading or Building Permits. ***(PLNG)***

79. All improvement agreements required in connection with said plans shall be submitted to and approved by the City and other agencies having jurisdiction over said project prior to issuance of the Building or Grading Permit. ***(ENGR)***

80. Faithful performance bonds and labor materials bonds in a penal amount equal to 100 percent of the approved estimates of construction costs of improvements shall be submitted to and approved by the City and other agencies having jurisdiction prior issuance of the Improvement, Encroachment, Building or Grading Permit, whichever comes first. ***(ENGR)***

81. Encroachment Permit Application:

    a. Pay the Filing Fee at the time of submittal of permit application, improvement plans and supporting documents to City Engineering Services for review. The current fee is $172.

b. Provide a restoration security before issuance of the Encroachment Permit. The security shall be in an amount sufficient to restore existing public improvements to a serviceable condition should development improvement activity cause damage. The amount of the security shall be determined by, and be in a form acceptable to the City Engineer.

c. Provide a $5,000 cash deposit to cover Condition Compliance/Mitigation Monitoring costs at the time of submittal of plans and documents to Engineering Services for review. The deposit will be placed in a refundable account. Condition Compliance/Mitigation Monitoring costs will be charged to this deposit over the life of the project permit and mitigation requirements. Any unused funds will be returned at project completion. If the initial deposit is insufficient to cover actual costs, an additional deposit in an amount determined by the City Engineer will be required.

d. Pay the Recycling, Construction, & Demolition fees and performance security fee. ***(ENGR)***

82. Grading Permit Application:

a. Pay Grading Permit Fees at submittal of a Grading Permit application. The current fee is determined based on cubic yardage of cut and fill combined, or at the hourly rate, which is currently $172.

b. Provide a $5,000 cash deposit for Erosion Control prior to issuance of Grading Permit. The deposit will be placed in a refundable account. Any unused funds will be returned at project completion. If the initial deposit is insufficient to cover actual costs, an additional deposit in an amount determined by the City Engineer will be required.

c. Pay Stockpile and Erosion Control Monitoring fee prior to issuance of Grading Permit. The stockpile and erosion control monitoring fee is currently $23 per calendar day and is collected for the life of the Grading Permit activity.

d. Pay the applicable fees for review of Storm Water Control O&M Agreement and bio-retention facilities inspection. ***(ENGR)***

OTHER/MISCELLANEOUS

83. Comply with the requirements of the Contra Costa County Health Department for the abandonment of existing septic tanks or wells. ***(ENGR) CMC***

84. Comply with the requirements of the Contra Costa Fire Protection District. Submit complete sets of plans and specifications to the Fire District for review and approval at:

Contra Costa County Fire Protection District
2010 Geary Road
Pleasant Hill, CA 94523

Plan review fees are assessed at that time. The City is not responsible for the collection of fees or enforcement of requirements imposed by the Fire District. ***(CCCFIRE)***

85. The applicant shall defend, indemnify and hold harmless the City, its agents, officials, and employees from any claim, action or proceeding brought by a third party to set aside, annul, attack or otherwise void the permit. ***(PLNG)***

86. The permit and approval shall expire in **one (1) year** from the date on which they became effective unless construction permits are obtained and work has begun. The effective date of the permit and approval is ***June 15, 2015 (PLNG)***

87. A request for a time extension from the expiration date of ***June 15, 2016*** can be considered if an application with required fee is filed at least 45 days before the original expiration date, otherwise a new application is required. A public hearing will be required for all extension applications, except those involving only Design Review. Extensions are not automatically approved. Changes in conditions, City policies, surrounding neighborhood, and other factors permitted to be considered under the law, may require, or permit denial. ***(PLNG)***

ATTACHMENT B

COSTCO WHOLESALE DEVELOPMENT ENVIRONMENTAL IMPACT REPORT

Prepared for
City of Concord
Planning Division

Prepared by
Mills Associates
Lafayette, California

September 1999

COSTCO
WHOLESALE DEVELOPMENT
ENVIRONMENTAL IMPACT REPORT

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1
INTRODUCTION

1
INTRODUCTION

PURPOSE OF THE EIR

The purpose of this Environmental Impact Report (EIR) is to evaluate the environmental consequences that would result from approving a preliminary development plan and rezoning for the construction of a Costco Wholesale facility and separate buildings that could contain up to 70,300 square feet of commercial/industrial uses on a 21.4-acre site located southwest of the Monument Boulevard/ Detroit Avenue intersection in Concord, California. This document includes an analysis of potential significant environmental effects, as well as recommended mitigation measures that would reduce potential significant environmental impacts to less-than-significant levels.

This EIR is intended as an informational document that, in itself, does not determine whether a project will be approved, but aids in the local planning and decision-making process. CEQA Guidelines stipulate that an EIR is not meant to be a technical document. Rather, it is intended to serve as a public disclosure document that: 1) identifies the environmental impacts associated with the proposed project which are expected to be significant; 2) describes mitigation measures that could minimize or eliminate significant adverse impacts; and 3) evaluates alternatives to the proposed project.

PROJECT SUMMARY

The proposed project is a preliminary development plan application for the construction of a 155,837-square foot commercial bulk retail facility containing a tire center and food court on a site totaling 21.4 acres. Project plans call for a three-island gas station, with two double-sided gasoline dispensers located in the southwest corner of the property. The total area of the Costco warehouse including the parking area and gas facility, encompasses 15.9 acres of the 21.4-acre site. The remaining 5.5 acres would be available to accommodate up to 70,300 square feet of commercial/industrial uses. Access to the facility is from Monument Boulevard and Detroit Avenue.

EIR SCOPE

An Initial Study Checklist was prepared and is included in this EIR as Appendix A. As required by Section 15126 of the CEQA Guidelines (1996, revised), this EIR focuses on those issues which could involve significant impacts from the project. The following topics have been identified as having potentially significant impacts due to the proposed project and are analyzed in greater detail in the EIR:

Land Use Compatibility
Drainage

Air Quality
Traffic
Biological Resources
Hazards
Noise
Visual Quality/Aesthetics
Cultural Resources

As required by CEQA Guidelines, a discussion of alternatives to the proposed project has also been included in the EIR. Additionally, the EIR incorporates a discussion regarding cumulative impacts, beneficial impacts of the project, growth inducing effects and irreversible environmental changes.

This Draft EIR is being circulated to local and state agencies and to interested organizations and individuals who may wish to review and comment on the report. Both written and oral comments may be made during the 45-day public review period. At the close of the public review period, written responses will be prepared for all oral and written comments received on the Draft EIR. The written responses and the Draft EIR will constitute the Final EIR for the project. The Final EIR and mitigation monitoring plan will be considered by the Concord City Council as a part of the review and approval process.

INTENDED USES OF THE EIR

In accordance with Section 21080 of the California Environmental Quality Act (CEQA), as amended, the City must consider the environmental implications of constructing the Costco facility prior to making a decision on the project. This EIR will be used by the City Council, Planning Commission and City staff in determining whether the project should be denied or approved. If approved, mitigation measures to reduce significant impacts would become conditions of project approval.

REPORT ORGANIZATION

Following this introduction is a summary of impacts and mitigation measures (Table 1-1) and the following report sections: Chapter 2 describes the project, Chapter 3 discusses the General Plan and zoning policies, and Chapter 4 discusses the environmental issues at length. For each issue relevant environmental setting information is presented to describe existing conditions on site, the impacts of the proposed project are evaluated, and mitigation measures are suggested. Less-than-significant impacts are also identified within each section. Chapter 5 provides an impact overview to the proposed project, including potential significant effects that cannot be mitigated, significant irreversible environmental changes, beneficial impacts, growth-inducing impacts and a summary of cumulative impacts.

Chapter 6 summarizes four alternatives to the proposed project. These include: 1) no project (continuation of the existing land use), 2) an alternative site plan (or scheme) that also reflects inclusion of a small adjoining parcel; 3) an alternative location (preferably near the freeway), and

4) development under the current General Plan designation. From this discussion an environmentally superior alternative will be identified.

Chapter 7 provides a list of preparers of the EIR, references, and organizations and individuals contacted during preparation of the EIR. The appendices contain the Initial Study, Mitigation Monitoring Program and additional technical information.

SIGNIFICANT IMPACTS AND MITIGATION MEASURES

CEQA Guidelines, Section 15382 (1998) defines a "significant effect on the environment" as a "substantial, or potentially substantial adverse change in any of the physical conditions within the area affected by the project including land, air, water, minerals, flora, fauna, ambient noise, and objects of historic or aesthetic significance. An economic or social change by itself shall not be considered a significant effect on the environment. A social or economic change related to a physical change may be considered in determining whether the physical change is significant."

The following table summarizes the significant impacts and mitigation measures required to reduce the impacts. The third column of the table indicates whether the impact can be mitigated to an acceptable level (less than significant). A discussion of project impacts and mitigation measures can be found throughout Chapter 4.

Table 1-1
SUMMARY OF SIGNIFICANT IMPACTS AND MITIGATION MEASURES

Significant Impact	Mitigation Measures	Does Implementation of the Mitigation Measure(s) Reduce the Impact to a Less-Than-Significant Level?
LAND USE		
IMPACT 4.1-1: The Costco building would be out of scale with the adjoining properties and with many of the buildings in the project vicinity.	**4.1-1A:** The project sponsor shall revise project plans to include additional trellises along the eastern wall to the left and right of the middle section where two trellises are currently proposed.	Yes
	4.1-1B: The project sponsor shall incorporate additional architectural treatment or landscaping on the southern and western elevations where large expanses of blank wall are visible. This can include the use of trellises, the planting of additional trees next to the building, or scoring the concrete and painting the wall with a darker tone.	Yes
IMPACT 4.1-2: The parking lot lights and service station canopy lights will create glare impacts for the residents in the Sierra Gardens condominiums who overlook the site.	**4.1-2:** The project sponsor shall reduce the wattage of the parking lot lights as well as install shorter light standards that do not exceed 30 feet. Two, 400-watt bulbs could be used on 30-foot-tall light poles.	Yes
IMPACT 4.1-3: Construction-related impacts would occur without implementation of mitigation measures.	**4.1-3A:** The project sponsor shall ensure that the following measures are included in construction contracts to control fugitive dust emissions during demolition of existing structures: • Water during demolition of structures and break-up of pavement to control dust generation. • Cover all trucks hauling demolition debris from the site.	Yes

Table 1-1 ***(cont.)***

Significant Impact	Mitigation Measures	Does Implementation of the Mitigation Measure(s) Reduce the Impact to a Less-Than-Significant Level?
IMPACT 4.1-3 *(continued)*	**4.1-3B**: The project sponsor shall ensure that the following measures are included in construction contracts to control fugitive dust emissions during grading and site preparation activities: • Water all active construction areas at least twice daily and when necessary. Active areas adjacent existing land uses shall be kept damp at all times, or shall be treated with non-toxic stabilizers or dust palliatives. • Cover all trucks hauling soil, sand, and other loose materials or require all trucks to maintain at least two feet of freeboard. • Pave, apply water three times daily, or apply (non-toxic) soil stabilizers on all unpaved access roads, parking areas and staging areas at construction sites. • Sweep daily (preferably with water sweepers) all paved access road, parking areas and staging areas at construction sites. • Sweep streets daily (preferably with water sweepers) if visible soil material is carried onto adjacent public streets	Yes

Table 1-1 *(cont.)*

Significant Impact	Mitigation Measures	Does Implementation of the Mitigation Measure(s) Reduce the Impact to a Less-Than-Significant Level?
IMPACT 4.1-3 *(continued)*	• Hydroseed or apply non-toxic soil stabilizers to inactive construction areas. • Enclose, cover, water twice daily or apply non-toxic soil binders to exposed stockpiles (dirt, sand, etc.). • Limit traffic speeds on unpaved roads to 15 mph. • Install tire grates at the site exits to avoid tracking mud from the site onto City streets. • Install sandbags or other erosion control measures to prevent silt runoff to public roadways.	
	4.1-3C: The project sponsor shall prepare and implement a noise attenuation plan that will include the following measures: • Limit construction activity between the hours of 7:00 a.m. and 6:00 p.m. with no construction activity on Sundays or holidays without prior written approval by the Chief of Planning. • Maintain and muffle all construction equipment powered by internal combustion engines. • Identify construction equipment staging areas that are 200 feet from residential units.	

Table 1-1 ***(cont.)***

Significant Impact	Mitigation Measures	Does Implementation of the Mitigation Measure(s) Reduce the Impact to a Less-Than-Significant Level?
DRAINAGE		
IMPACT 4.2-1: If storm water runoff from portions of the project site are routed into either of the existing City drain lines along the site's east and west boundaries, the resulting peak flow rates could exceed available capacities, resulting in localized flooding along upstream portions of these drainage systems.	**4.2-1**: The project sponsor shall prepare a drainage plan and calculations demonstrating that there shall be no increase in either the rate or total volume of runoff from the project site into the existing storm drain systems along the site's east and west boundaries unless it can be demonstrated that sufficient capacity exists to accommodate the increased runoff. This can be accomplished with either previously prepared drainage studies or by a new study prepared by the project sponsor, in accordance with City design criteria.	Yes
IMPACT 4.2-2: Development of the proposed project would prevent future construction of a new drainage outlet to Pine Creek for the Cloverdale Avenue area, as described in the City's Master Drainage Plan.	**4.2-2**: The project's central drainage system shall extend to Detroit Avenue, in the vicinity of Cloverdale Avenue. It shall have sufficient capacity to accommodate the runoff from the Cloverdale Avenue neighborhood, as defined by the City Engineering and Transportation Department, and it shall be routed through a drainage easement that grants the City all required access rights.	Yes
IMPACT 4.2-3: If the project's central drainage system cannot be connected to the existing 36-inch diameter culvert stub in the Pine Creek channel, a new connection will have to be installed, which could potentially compromise the integrity of the existing Pine Creek concrete channel.	**4.2-3**: The pipe connection into the Pine Creek channel and all associated modifications of the existing channel walls shall be constructed in accordance with design requirements set forth by the Flood Control District.	Yes
IMPACT 4.2-4: Soil erosion would be expected to increase during project construction.	**4.2-4**: The project sponsor shall prepare a Storm Water Pollution Prevention Plan to control erosion on the project site during construction.	Yes

Table 1-1 ***(cont.)***

Significant Impact	Mitigation Measures	Does Implementation of the Mitigation Measure(s) Reduce the Impact to a Less-Than-Significant Level?
IMPACT 4.2-5: The quality of storm water runoff from the developed project site would be expected to decline, resulting from an increase in the production of non-point source urban pollutants.	**4.2-5A:** The project sponsor shall prepare a plan for regular maintenance and long-term implementation of its Clean Water Program responsibilities, for approval and monitoring by the City Engineering and Transportation Department.	Yes
	4.2-5B: The drainage system and site plan shall be configured to provide infiltration areas throughout the project to capture the "first flush" of storm water runoff, in accordance with the recommendations set forth in the Bay Area Stormwater Management Agencies Association "Start at the Source" design guidance manual.	Yes
AIR QUALITY		
IMPACT 4.3-1: Construction activities such as demolition, excavation and grading operations, construction vehicle traffic and wind blowing over exposed earth would generate exhaust emissions and fugitive particulate matter emissions that would affect local air quality.	**4.3-1A:** The project sponsor shall ensure that the following measures are included in construction contracts to control fugitive dust emissions during demolition of existing structures:	Yes
	• Water during demolition of structures and break-up of pavement to control dust generation. • Cover all trucks hauling demolition debris from the site.	

Table 1-1 ***(cont.)***

Significant Impact	Mitigation Measures	Does Implementation of the Mitigation Measure(s) Reduce the Impact to a Less-Than-Significant Level?
IMPACT 4.3-1 *(continued)*	**4.3-1B**: The project sponsor shall ensure that the following measures are included in construction contracts to control fugitive dust emissions during grading and site preparation activities: • Water all active construction areas at least twice daily and when necessary. Active areas adjacent existing land uses shall be kept damp at all times, or shall be treated with non-toxic stabilizers or dust palliatives. • Cover all trucks hauling soil, sand, and other loose materials or require all trucks to maintain at least two feet of freeboard. • Pave, apply water three times daily, or apply (non-toxic) soil stabilizers on all unpaved access roads, parking areas and staging areas at construction sites. • Sweep daily (preferably with water sweepers) all paved access road, parking areas and staging areas at construction sites. • Sweep streets daily (preferably with water sweepers) if visible soil material is carried onto adjacent public streets. • Hydroseed or apply non-toxic soil stabilizers to inactive construction areas.	Yes

Table 1-1 *(cont.)*

Significant Impact	Mitigation Measures	Does Implementation of the Mitigation Measure(s) Reduce the Impact to a Less-Than-Significant Level?
IMPACT 4.3-1 *(continued)*	• Enclose, cover, water twice daily or apply non-toxic soil binders to exposed stockpiles (dirt, sand, etc.). • Limit traffic speeds on unpaved roads to 15 mph. • Install tire grates at the site exits to avoid tracking mud from the site onto City streets. • Install sandbags or other erosion control measures to prevent silt runoff to public roadways.	
IMPACT 4.3-3: New traffic generated by the project would increase regional emissions. This impact cannot be fully mitigated and is therefore significant and unavoidable.	**4.3-3:** No mitigation measure is available.	No
TRAFFIC		
PROJECT IMPACTS		
IMPACT 4.4-1: Project-generated traffic would cause the level of service at the intersection of Detroit Avenue and Whitman Road to deteriorate to LOS F during the Saturday peak period.	**4.4-1:** The project sponsor shall install signals at the Detroit Avenue/Whitman Road intersection since the signal would not be needed without the project.	Yes
IMPACT 4.4-2: Project-generated traffic would result in left-turn queuing at the westbound approach to the intersection of Monument Boulevard and Detroit Avenue that would exceed left-turn lane capacity.	**4.4-2:** The project sponsor shall extend the existing left-turn lane at the westbound approach to the intersection of Monument Boulevard and Detroit Avenue to 250 feet, provide an additional left-turn lane of the same length, and adjust the signal timing to eight-phase to provide protected left-turn phases.	Yes

Table 1-1 ***(cont.)***

Significant Impact	Mitigation Measures	Does Implementation of the Mitigation Measure(s) Reduce the Impact to a Less-Than-Significant Level?
IMPACT 4.4-3: On-site queuing at the main site entrance during worst-case conditions (PM Peak) would result in unacceptable delays and congestion in internal circulation.	**4.4-3A:** The project sponsor shall install a traffic signal at the main entrance to the project site.	Yes
	4.4-3B: The project sponsor shall be required to provide parking on site to the impacted businesses equal to the number of parallel parking stalls eliminated on Detroit Avenue.	Yes
CUMULATIVE IMPACTS		
IMPACT 4.4-4: Level of service at the intersection of Detroit Avenue and Whitman Road will deteriorate to LOS F during the Saturday peak period.	**4.4-4:** The project sponsor shall install signals at the Detroit Avenue/Whitman Road intersection since the signal would not be needed without the project.	Yes
IMPACT 4.4-5: Cumulative future traffic, including project-generated traffic, would result in left-turn queuing at the westbound approach to the intersection of Monument Boulevard and Detroit Avenue that would exceed left-turn lane capacity and degrade level of service below acceptable levels.	**4.4-5:** The project sponsor shall extend the existing left-turn lane at the westbound approach to the intersection of Monument Boulevard and Detroit Avenue to 250 feet, provide an additional left-turn lane of the same length, and adjust the signal timing to eight-phase.	Yes

Table 1-1 ***(cont.)***

Significant Impact	Mitigation Measures	Does Implementation of the Mitigation Measure(s) Reduce the Impact to a Less-Than-Significant Level?
BIOLOGICAL RESOURCES		
IMPACT 4.5-2: Water quality in Pine Creek could be adversely affected by construction activities.	**4.5-2A:** Prior to the initiation of any grading or land clearing in areas that could drain to Pine Creek, the project sponsor shall prepare and implement a Storm Water Pollution Prevention Plan (SWPPP). This plan shall be consistent with the applicable requirements of Contra Costa County's non-point source NPDES program. The plan should prevent the movement of sediment from the upland areas subject to construction into the off-site Pine Creek.	Yes
	4.5-2B: Any topsoil to be stockpiled shall be located in areas on the site where runoff to Pine Creek will not occur.	Yes
	4.5-2C: Equipment storage and staging areas shall be located in disturbed areas or areas within the development envelope where runoff to Pine Creek will not occur.	Yes
	4.5-2D: Fueling and maintenance of equipment shall be conducted in the northeast corner of the project site or along the Detroit Avenue corridor to prevent any leakage or runoff into Pine Creek.	Yes

Table 1-1 ***(cont.)***

Significant Impact	Mitigation Measures	Does Implementation of the Mitigation Measure(s) Reduce the Impact to a Less-Than-Significant Level?
IMPACT 4.5-4: Development of the project site could result in the loss of potential breeding habitat for migratory birds and potential roosting habitat for special-status bat species due to removal of 53 trees and demolition of existing buildings.	**4.5-4:** A biological survey shall be conducted of all on-site trees and buildings that may contain roosting sites. The survey should begin no more than 30 days prior to construction. This survey will determine if nests of protected bird and special-status bat species' roosting sites are present on site. If active nests or roosts are present, recommendations on construction buffers, scheduled removal of the trees and/or buildings shall be developed and any other protective measures will be made. These measures would require the approval of California Department of Fish and Game. Once the measures have been approved by the California Department of Fish and Game, they will be implemented.	Yes
IMPACT 4.5-5: Runoff from the gas station and the parking lot could pollute Pine Creek.	**4.5-5A:** The project sponsor shall install oil/grease separators in the storm drain system for the parking lot and developed area to prevent the runoff of oil and grease into Pine Creek.	Yes
IMPACT 4.5-5 *(continued)*	**4.5-5B:** The project sponsor shall prepare and implement a containment plan for the gas station site that will result in the prevention of runoff of any gas or gas station pollutants into Pine Creek.	Yes
HAZARDS		
No significant impacts.		

Table 1-1 ***(cont.)***

Significant Impact	Mitigation Measures	Does Implementation of the Mitigation Measure(s) Reduce the Impact to a Less-Than-Significant Level?
NOISE		
IMPACT 4.7-2: The majority of non-transportation (stationary) noise sources generated by the proposed project would be compatible with surrounding land uses including noise-sensitive receptors (multi-family apartments) to the southwest. However, noise levels generated by parking lot maintenance activities could exceed established noise standards.	**4.7-2:** The use of leaf blowers shall be restricted to the hours of 7:00 a.m. to 6:00 p.m., Monday through Saturday.	Yes
IMPACT 4.7-3: Noise levels associated with development of the residual property could exceed City standards.	**4.7-3:** A noise study shall be conducted for the residual property to determine potential noise impacts associated with the future development of buildings and necessary mitigation measures to reduce noise levels below City standards.	Yes
IMPACT 4.7-5: Construction of the proposed project will temporarily increase noise levels at noise-sensitive receptors.	**4.7-5:** The project sponsor shall prepare a noise attenuation plan that will include the following restrictions: • Limit construction activity to daytime hours (7:00 a.m. to 6:00 p.m.) with no construction activity on Sundays or holidays without prior written approval by the Chief of Planning. • Maintain and muffle all construction equipment powered by internal combustion engines. • Identify construction equipment staging areas that are 200 feet from residential units.	Yes

Table 1-1 ***(cont.)***

Significant Impact	Mitigation Measures	Does Implementation of the Mitigation Measure(s) Reduce the Impact to a Less-Than-Significant Level?
VISUAL QUALITY/AESTHETICS		
IMPACT 4.8-1: The Costco building will dominate the west side of the Detroit Avenue streetscape between Monument Boulevard and Shary Circle.	**4.8-1A:** The project sponsor shall revise project plans to include additional trellises along the eastern wall to the left and right of the middle section where two trellises are currently proposed.	Yes
	4.8-1B: The project sponsor shall incorporate additional architectural treatment or landscaping on the southern and western elevations where large expanses of blank wall are visible. This can include the use of trellises, the planting of additional trees next to the building, or scoring the concrete and painting the wall with a darker tone.	Yes
IMPACT 4.8-3: The gas station and the glare of its lights will be visible to residents overlooking the project site.	**4.8-3:** The project sponsor shall revise the landscape plan to extend the tree mix around the south/southwest perimeter of the gas station area. The depth of the planting should be similar to that placed between the western property line and the gas station area as shown on the conceptual landscape plan in Figure 2-3.	Yes
IMPACT 4.8-4: The glare of the parking lot lights will be evident to residents overlooking the project site.	**8-4A:** The project sponsor shall reduce the wattage of the parking lot lights as well as install shorter light standards that do not exceed 30 feet. Two, 400-watt bulbs could be used on 30-foot-tall light poles.	Yes

Table 1-1 ***(cont.)***

Significant Impact	Mitigation Measures	Does Implementation of the Mitigation Measure(s) Reduce the Impact to a Less-Than-Significant Level?
	4.8-4B: The project sponsor shall revise either the landscape plan or the lighting plan to avoid lighting conflicts between the trees and light poles. Either place the lights in the middle of the parking row reserving the ends for landscaping, or place a grouping of trees in the center of the parking row. If the latter alternative is selected, shrubbery should be placed around the base of the light pole.	Yes
CULTURAL RESOURCES		
IMPACT 4.9-1: Construction of the proposed Costco facility would involve site grading that could potentially disturb and damage buried historical and/or archaeological artifacts or human remains.	**4.9-1A:** During all grading and excavation activities, if cultural resources are encountered, all work shall be halted and the Planning Division notified at once.	Yes
IMPACT 4.9-1 *(continued)*	**4.9-1B:** If human remains are among any artifacts uncovered during site disturbance or excavation, all ground-disturbing work shall cease, and the County Coroner and the City of Concord Chief of Planning and Building Official must be notified immediately. If the coroner determines the remains to be Native American, the Native American Heritage Commission must be contacted within 24 hours. The qualified archaeologist, in consultation with the Native American Heritage Commission, will recommend subsequent measures for disposition of the remains.	Yes

2
PROJECT DESCRIPTION

2
PROJECT DESCRIPTION

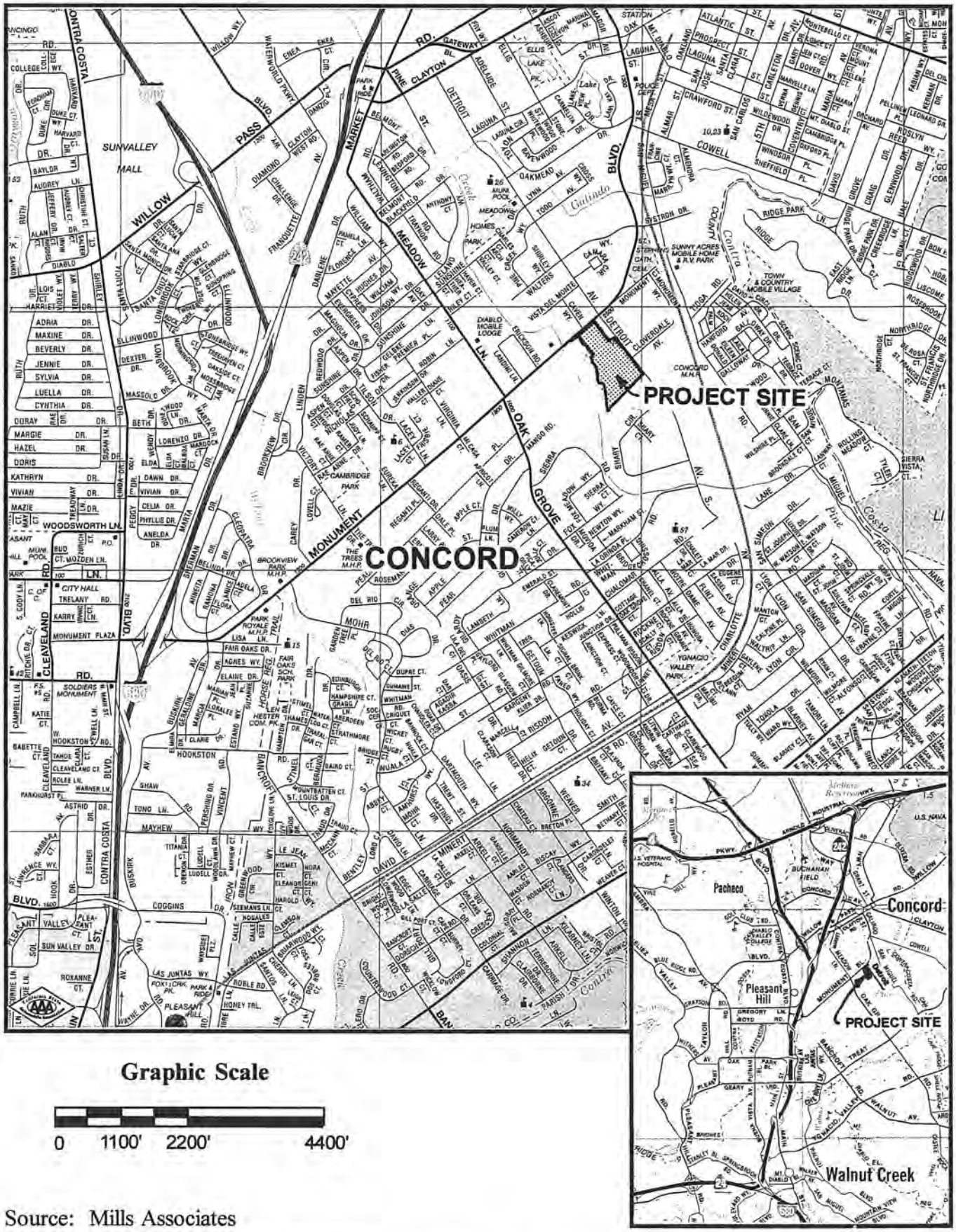
SITE LOCATION AND PHYSICAL SETTING

The 21.4-acre project site is located near the southwest intersection of Monument Boulevard and Detroit Avenue in the City of Concord, Contra Costa County, California. The undeveloped site is located approximately one and one-half miles east of I-680, northeast of Oak Grove Road. (Refer to Figure 2-1 for location of the project site.) With the exception of a recreational vehicle sales operation located adjacent to Monument Boulevard, the project site is currently vacant. The site is generally flat, dropping gradually from south to north, following the fall of adjacent Pine Creek. A low hill covers the eastern third of the property, rising five to eight feet above the site perimeter along Detroit Avenue, Pine Creek and the adjoining Shary Circle light industrial park. The site has been used for stockpiling of soil and rubble and as a result, the terrain is uneven. Elevations range from 45 to 60 feet above sea level. Most of the site is covered with low dense grasses, vegetation, and scattered trees that include walnuts, elm, Monterey pine, coast redwood, yellow willow, poplars and Hollywood juniper. The Pine/Galindo Creek storm drain channel forms the site's western boundary. The project site is made up of the following parcels: APN 129-030-035, 129-030-014, 129-030-007, 129-030-027, 129-040-007.

Land uses in the project vicinity are a mix of light industrial, commercial and multi-family housing. Adjacent land uses include a service station, miscellaneous commercial, condominiums, vacant land, light industry (industrial parks), and a flood control channel.

PROJECT DETAILS

The project submitted by Costco Wholesale of Issaquah, Washington, is for the construction of a 155,837-square foot commercial bulk retail/wholesale facility containing a tire center and food court on a site totaling 21.4 acres. Project plans also call for a three-island gas station each with two double-sided gasoline dispensers that allow for twelve fueling stations. The pumps are fully automated and self-serving for Costco members only. The gas facility is located in the southwestern corner of the property. The total area of the Costco warehouse, including the parking area and gasoline facility, encompasses 15.9 acres of the 21.4-acre site. The remaining 5.5 acres would be available to accommodate up to 70,300 square feet of commercial/industrial uses. (The project sponsor's site plan shows five buildings totaling 70,300 square feet.) Access to the project site is from Monument Boulevard and Detroit Avenue. Refer to the site plan in Figure 2-2.

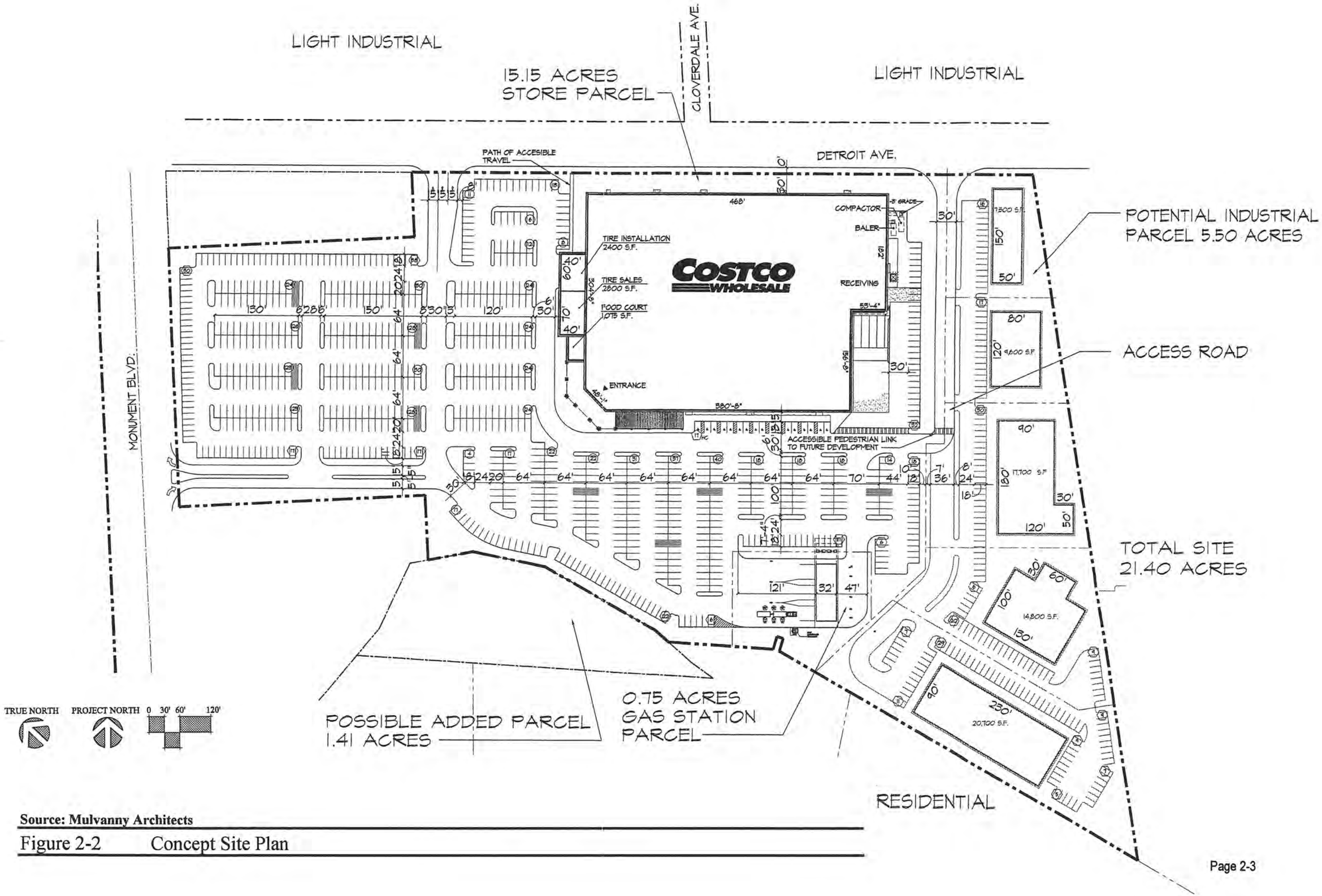


Graphic Scale

0 1100' 2200' 4400'

Source: Mills Associates

Figure 2-1 Local and Regional Site Location Map



Source: Mulvanny Architects

Figure 2-2 Concept Site Plan

As shown in the site plan, the Costco building is sited along the easterly property line, adjacent to Detroit Avenue and faces into the site. Access to the site will be from Monument Boulevard and Detroit Avenue. The tire center and food court will be located along the north-facing side of the building, accessible only through the main entrance located in the northwest corner. The receiving area is located on the south side of the building closer to the existing light industrial park. The receiving area is designed to accommodate four trucks at a time. In the southeast corner of the building, closest to Detroit Avenue, is located the machinery for compacting and baling the cardboard refuse. The gas islands are located along the westerly property line. Parking is provided primarily on the north and west sides of the building and includes 838 stalls for Costco and 175 stalls for the additional commercial buildings, for a project total of 1,013 stalls.

The primary pedestrian access to the Costco warehouse building will be from the sidewalk on Detroit Avenue, along the north side of the building past the tire center and the food court, to the main entrance to the warehouse. A secondary pedestrian access will be provided upon development of the industrial parcel, crossing the main east-west driveway which accesses the buildings on the industrial parcel, past the concrete apron of the loading docks over the sidewalk along the west side of the warehouse building to the main entrance. The parking lots are designed so that the parking aisles point towards the warehouse building, and the aisles are designed to accommodate two-way vehicle traffic and pedestrians with shopping carts.

The project will be drained by storm sewer lines. The northernmost parking field currently is asphalted and drains to Monument Boulevard. The eastern half of this field will continue to drain to Monument Boulevard while the western half will be redirected to Pine Creek. The southeastern corner of the site will drain to Detroit Avenue, while all areas west of the loading docks will drain to Pine Creek. Costco will vacuum sweep the parking lots two to three times a week to remove heavy metal materials and sediments. Costco will install filters at the storm drain inlets to capture contaminants that could eventually flow into Pine Creek.

As shown in Figure 2-3, the Conceptual Landscape Plan, the perimeter of the site will be landscaped with canopy street trees and broadleaf shade trees, interspersed with accent trees such as redbud or magnolia and shrubs. Throughout the parking lot broadleaf shade trees, accent trees and shrubs are found at the ends of each parking section. The median strip for the Monument Boulevard entrance will be planted with accent trees. Conifers, such as incense cedar, shore pine or Italian Cypress, are located in pockets adjacent to the structure. Along the Detroit Avenue facade are placed three trellises for climbing vines. A mix of trees is located in the westerly corners of the property between the parking and the property line. Figures 2-4, 2-5 and 2-6 depict the architect's illustrations of the landscaping adjacent to the warehouse and around the gas facility.

The parking lot will be lighted with standard downward pointing lights, each containing two 1,000-watt metal-halide bulbs affixed to a 35-foot light pole. The lighting fixtures are of a "shoe-box" style with the bulbs recessed in the shoe box to minimize dispersion and glare.

The building exterior will be of concrete masonry block, scored in places to break up the building facade. Steel frame canopies hang over the smaller "non" public entrances on the eastern and southern elevations, as well as over the roll-up door for the tire center on the north side. Refer to Figure 2-7. The main entrance to the building is depicted on Figure 2-7 and in Figures 2-8 and 2-9. The lower portion of the building on either side of the main entrance is recessed, providing a covered area for customers as is illustrated in Figures 2-8 and 2-9. The supporting posts are of concrete masonry block. As shown in Figure 2-9, a larger steel canopy slopes away from the structure. This covers the shopping cart storage area. The building colors range from light to dark beige tones. The primary color is a medium shade of beige accented by the darker shade where the building face has been scored. Horizontal elements on the east and north elevation will be painted red (refer to Figure 2-7).

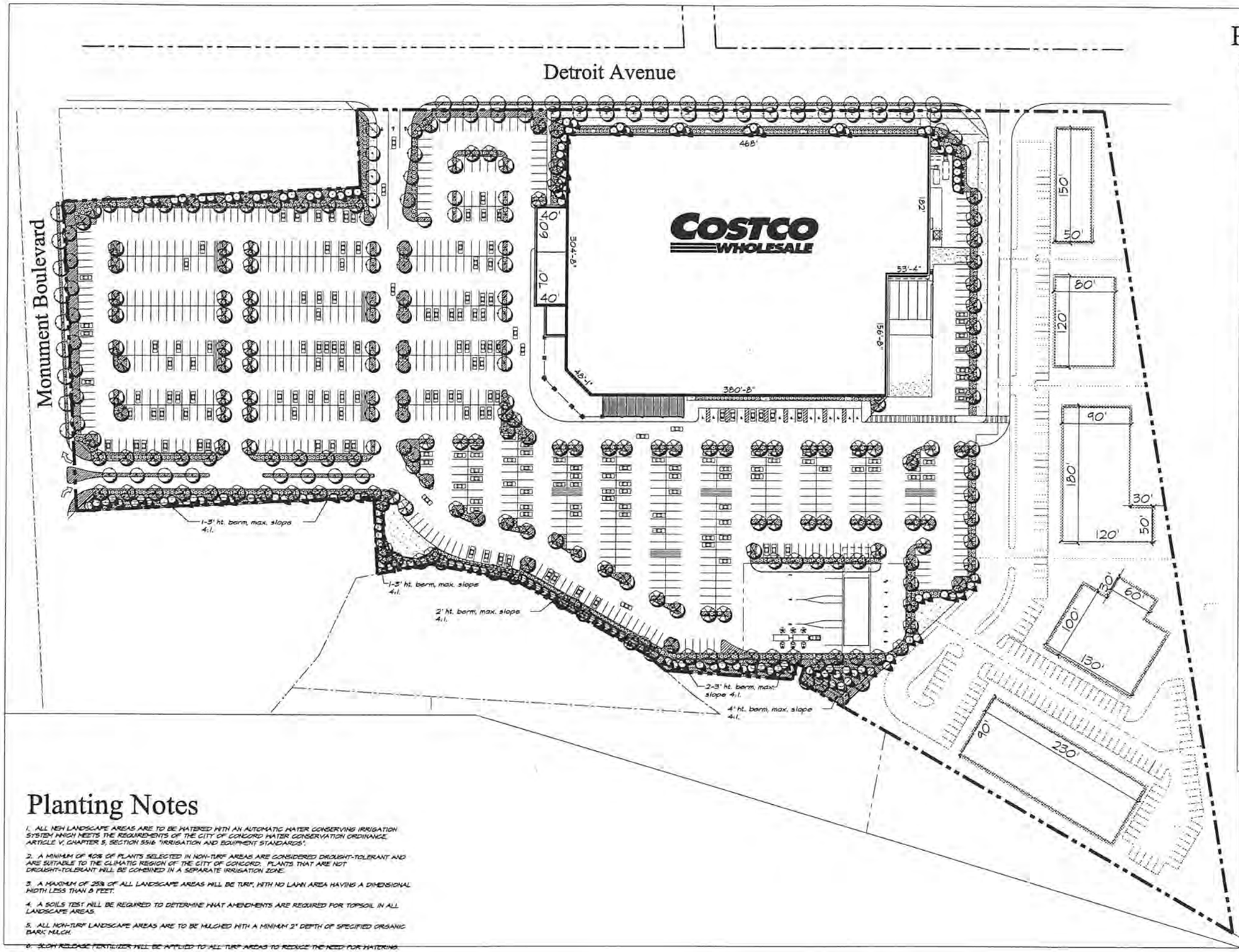
Costco signs on each elevation as shown in Figure 2-7 will be externally-illuminated, raised letters in the same red with accent stripes and "WHOLESALE" in blue. The mass of the building is broken up by varying the height of the parapet as shown in Figures 2-7 through 2-9, columns and changes in the planes of the facade to create relief and shadowing, and landscaping to soften its lines, especially along the Detroit Avenue street front (Figure 2-7).

As shown in Figure 2-6, the gasoline service area will be covered with a hip-roof style canopy that will extend 88 feet across and extend 18 feet high. Around the perimeter of the canopy will be a metal fascia panel painted to match the warehouse. The canopy is supported by brick columns. Lights will be recessed in the canopy.

OPERATIONS DESCRIPTION

The new store will replace the existing Martinez Costco store. The Costco warehouse in Martinez currently employs approximately 217 persons, and the larger Concord store and gas facility are expected to employ approximately 286 persons, totaling between 75 and 125 employees per shift.[1] Costco representatives anticipate that many of the employees at the Martinez store will work at the new location in Concord, but with expansion and attrition, it is likely that there may be approximately 100 positions to fill when the Concord store opens. The Costco warehouse will be opened Monday through Friday from 10:00 a.m. to 8:30 p.m., Saturday 9:30 a.m. to 6:00 p.m. and Sunday 10:00 a.m. to 6:00 p.m. The gas facility hours of operation typically extend from 6:00 a.m. to 10:00 p.m. weekdays and from 7:00 a.m. to 6:00 p.m. weekends.

Costco anticipates an average of about 18 trucks delivering goods on a typical weekday. The trucks range in size from 26 feet long for single-axle trailers to 54 feet long for double axle trailers. Receiving time is from 4:00 a.m. to 12:00 p.m., averaging 2 to 3 trucks per hour, with most of the deliveries completed before the 10:00 a.m. opening time. Deliveries to the warehouse are made primarily in Costco trucks from its freight consolidation facility in Tracy, California. Trucks will be routed from Interstate 680 along Monument Boulevard to Detroit Avenue. They will access the project from the driveway on Detroit Avenue south of the building, which will be sign-posted for truck access, then veer northwesterly towards the building and beyond the loading



Preliminary Landscape Legend

SYMBOL	BOTANICAL / COMMON NAME	SIZE/CONDITION
	CANOPY STREET TREES:	Min. 2" caliper, 24" box min. 10'-12' ht.
	Platanus acerifolia 'Yarwood' Plane Tree	
	BROADLEAF SHADE TREES:	Min. 2" caliper, 24" box min. 10'-12' ht.
	Fraxinus oxycarpa Raywood Ash	
	Koelreuteria paniculata Golden Rain Tree	
	Liquidambar s. 'Palo Alto' Palo Alto Sweetgum	
	Sophora japonica Scholar Tree	
	Zelkova serrata Sawleaf Zelkova	
	CONIFEROUS TREES:	Min. 6' height, 24" box, full and lively to base.
	Calocedrus decurrens Incense Cedar	
	Quercus suber Cork Oak	
	Cupressus sempervirens Italian Cypress	
	Pinus contorta Shore Pine	
	Pinus nigra Austrian Pine	
	ACCENT TREES:	Min. 1-1/2" cal., 24" box, 8' height min.
	Cercis occidentalis Redbud	
	Lagerstromia indica var. Crape Myrtle	
	Magnolia soulangiana Saucer Magnolia	
	Malus sp. Crabapple	
	Pyrus calleryana Red Spire Pear	
	Prunus cerasifera 'KY' Flowering Plum	
	SHRUBS:	5 gal. cont., 24" ht. and/or spread min.
	Abelia g. 'Ed Goucher' Ed Goucher Abelia	
	Bougainvillea spp. Bougainvillea	
	Ceanothus spp. Wild Lilac	
	Cistus spp. Rockrose	
	Escallonia exoniensis 'Frades' Frades Escallonia	
	Nandina domestica Heavenly Bamboo	
	Nerium oleander var. Oleander	
	Rhaphiolepis spp. Indian Hawthorn	
	Xylosma congestum Xylosma	
	GROUNDCOVERS:	4" pots @ 24" o.c. triangular spacing First plant 18" from edge of planter. or Flats @ 12" o.c. triangular spacing First plant 12" from edge of planter.
	Gazania spp. Gazania	
	Lampranthus spp. Ice Plant	
	Lantana spp. Trailing Lantana	
	Verbena spp. Verbena	
	ACCENTS:	1 gal. cont. at 36" o.c. triangular spacing First plant 18" from edge of planter; see plan for quantity.
	Agapanthus spp. Agapanthus	
	Dietes bicolor Fortnight Lily	
	Phormium tenax New Zealand Flax	
	Tulbaghia violacea Society Garlic	
	LAWN:	Seeded or Sodded

Planting Notes

1. ALL NEW LANDSCAPE AREAS ARE TO BE WATERED WITH AN AUTOMATIC WATER CONSERVING IRRIGATION SYSTEM WHICH MEETS THE REQUIREMENTS OF THE CITY OF CONCORD WATER CONSERVATION ORDINANCE, ARTICLE V, CHAPTER 5, SECTION 5516 'IRRIGATION AND EQUIPMENT STANDARDS'.
2. A MINIMUM OF 40% OF PLANTS SELECTED IN NON-TURF AREAS ARE CONSIDERED DROUGHT-TOLERANT AND ARE SUITABLE TO THE CLIMATIC REGION OF THE CITY OF CONCORD. PLANTS THAT ARE NOT DROUGHT-TOLERANT WILL BE COMBINED IN A SEPARATE IRRIGATION ZONE.
3. A MAXIMUM OF 25% OF ALL LANDSCAPE AREAS WILL BE TURF, WITH NO LAWN AREA HAVING A DIMENSIONAL WIDTH LESS THAN 8 FEET.
4. A SOILS TEST WILL BE REQUIRED TO DETERMINE WHAT AMENDMENTS ARE REQUIRED FOR TOPSOIL IN ALL LANDSCAPE AREAS.
5. ALL NON-TURF LANDSCAPE AREAS ARE TO BE MULCHED WITH A MINIMUM 2" DEPTH OF SPECIFIED ORGANIC BARK MULCH.
6. SLOW RELEASE FERTILIZER WILL BE APPLIED TO ALL TURF AREAS TO REDUCE THE NEED FOR WATERING.
7. WHERE GROUNDCOVER IS PROVIDED, IT SHALL BE PLANTED AT THE SPECIFIED SPACING THROUGHOUT THE BED.
8. GROWN ALL PLANTING BEDS AND PARKING ISLANDS MIN. 6"-12" HT. WITH SPECIFIED TOPSOIL.
9. SHRUBS TO BE MAINTAINED AT A MAXIMUM 3' HT. AND TREES TO BE LIMBED TO A HEIGHT 8' ABOVE GROUND IN ALL SIGHT LINE SETBACK AREAS.
10. REFER TO SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.

0 25' 50' 100'
SCALE: 1" = 50'-0"

Source: Mulvanny Architects

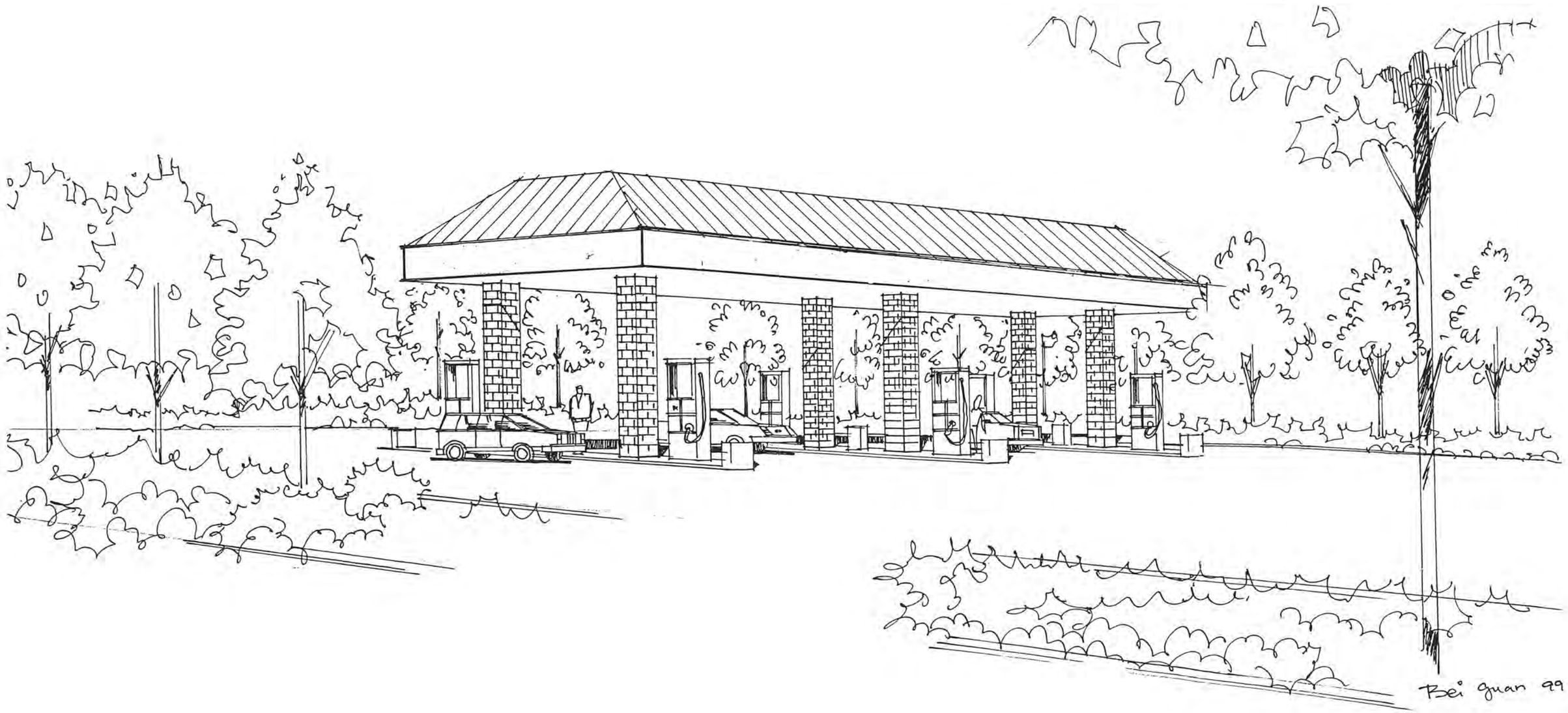
Figure 2-3 Concept Landscape Plan

Source: Mulvanny Architects

Figure 2-4 Sketch of Northeast Facade from Detroit Avenue

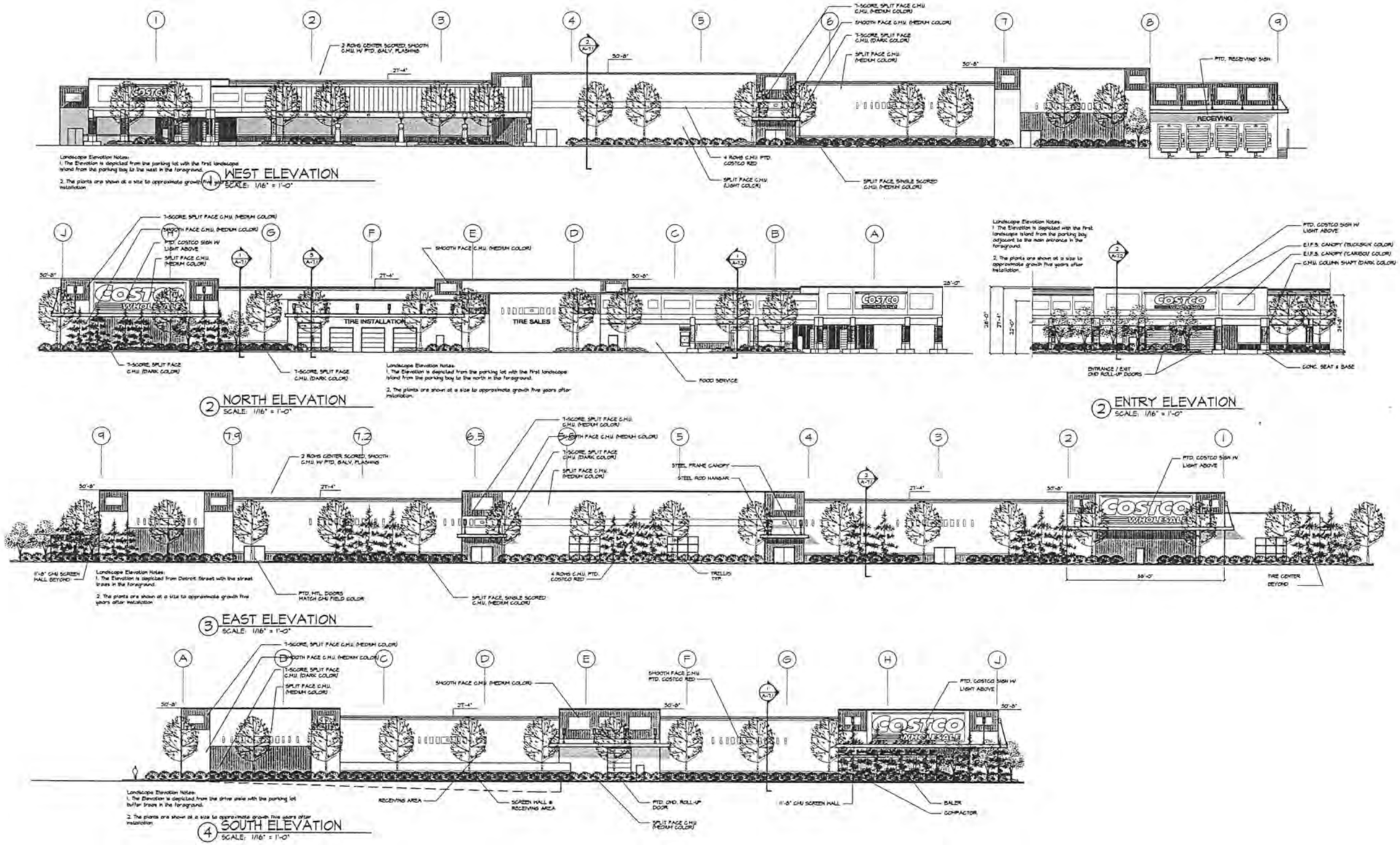
Source: Mulvanny Architects

Figure 2-5 Sketch of Trellis Treatment on Detroit Avenue Facade



Source: Mulvanny Architects

Figure 2-6 Sketch of Gas Station

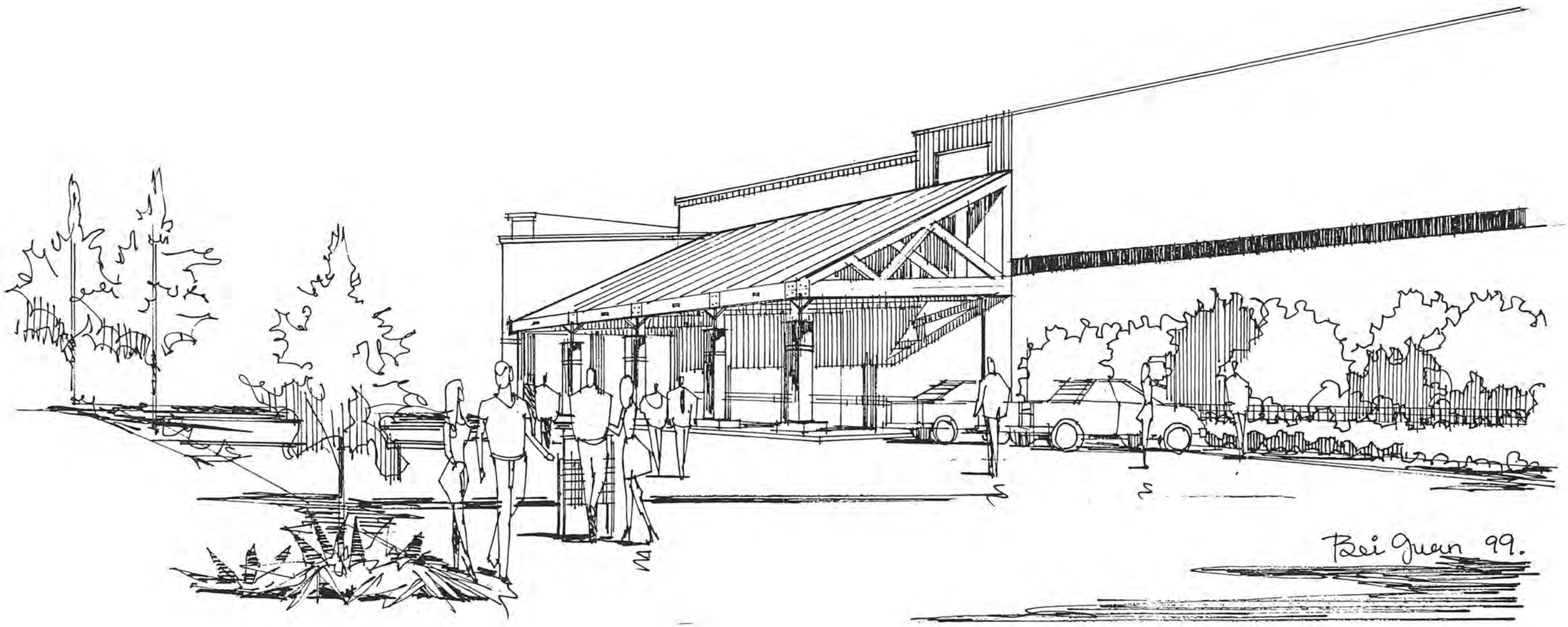


Source: Mulvanny Architects

Figure 2-7 Building Elevations

Source: Mulvanny Architects

Figure 2-8 Sketch of Storefront Entry



Source: Mulvanny Architects

Figure 2-9 Sketch of Entry Canopy

docks, backing into the loading docks (see Figure 2-2). After the trucks are unloaded, they will exit the site at the southerly driveway to Detroit Avenue, proceeding to Monument Avenue, to access I-680.

Fuel will be delivered to the gasoline facility in two to three trucks per day. The fuel trucks will come from I-680, via Monument Boulevard to the Monument Boulevard entrance to the project, and proceed over the drive aisle along the westerly property line. The largest fuel trucks are approximately 70 feet long and carry up to about 9,000 gallons. While delivering the fuel, the truck will be parked over the underground tanks located on the west side of the gas facility (Figure 2-2). The truck will not block access to any of the twelve fueling positions, but its presence may discourage customers from accessing the westerly most bay. According to Costco representatives, every effort is made to schedule deliveries at non-peak periods and usually before 10:00 a.m. The gas facility is located at the most remote area of the Costco parcel with accessibility designed to avoid traffic/queuing conflicts with the warehouse. After delivering the fuel, the truck will proceed through the gasoline facility, head west towards the loading docks, then turn right and exit via the same course to I-680 as is used by the Costco warehouse delivery trucks.

The tire center typically receives shipments of tires two times per week [2] in single- or double-trailer trucks of up to 60 feet in length, and pick up of old tires usually will occur once per week in 28 foot long trucks. Their typical routing will be from I-680 via Monument Boulevard to Detroit Avenue to the main entrance then to the tire center; they will depart by returning to the main entrance, turning left onto Detroit Avenue, left onto Monument Boulevard and proceeding to I-680. Deliveries to and pickups from the tire center will be scheduled for pre-opening hours, typically about 6:00 a.m.

In an average week, a total of approximately 100 to 110 trucks will call upon the Costco warehouse, tire center and gas facility.

OTHER REGULATORY PERMITS

In order to open and operate the gas facility, Costco will have to meet requirements of local, state and federal regulators and agencies, including the Contra Costa County Fire Protection District, the Contra Costa County Environmental Health--Hazardous Materials Division (Hazardous Materials/Underground Tank Permit), the Contra Costa Certified Unified Program Agency, the Bay Area Air Quality Management District, the State Water Resources Control Board, the California Environmental Protection Agency, and the United States Environmental Protection Agency.

CONSTRUCTION SCHEDULE

Costco representatives anticipate that groundbreaking will occur in the spring of 2000. Demolition of existing structures, grading, and construction are anticipated to last for approximately four to five months, with an anticipated opening in September 2000.[3]

PROJECT PROPONENT'S OBJECTIVES

Costco's objectives for the proposed project include:

- Relocation of the existing Costco facility in Martinez to a location that is more easily accessible for that warehouse's membership, which includes not only members living in the City of Concord, but also in Pleasant Hill, Lafayette, Walnut Creek, Clayton and Martinez (see Global Trip Distributions in Appendix D-1).
- Relocation of the existing Martinez facility to a site which will minimize overlap of trade areas with other Costco facilities, in particular the warehouse in Antioch.
- Replacing the existing Martinez warehouse (which is only 120,893 square feet) with a state-of-the-art, full-sized warehouse to better serve Costco's members.
- Development of the vacant 21.4-acre commercial parcel with a Costco Wholesale warehouse and gasoline service area and a complementary mix of light industrial and wholesale uses.
- Enhancement of the area with an economically viable, unified wholesale/industrial center which is architecturally designed with integrated development guidelines for the entire project.
- Subdivision of the project site for potential future sale, lease, or financing purposes to ensure continuity of unified design.
- Completion of the relocation by September 2000.

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[1] Jack S. Frank, Director of Development, Costco, written communication, May 7, 1999.

[2] Darren Pollard, Project Manager, Mulvanny Architects, written communication, April 30, 1999.

[3] J.S. Frank, telephone communication, May 12, 1999.

3
PLANNING POLICY

3
PLANNING POLICY

ZONING

The site is presently zoned Planned Industrial as shown on Figure 3-1. The surrounding area is a mix of zoning designations. Along Monument Boulevard between Oak Grove and Detroit, properties are zoned Service Commercial along the north side of the roadway and Planned District on the south side. Across Detroit Avenue from the project site, properties are zoned Service Commercial and Light Industrial. Adjacent to the project site on its southern boundary, the zoning is also Planned Industrial. Directly west of the project site across the drainage canal, the zoning is Apartment and Professional Office.

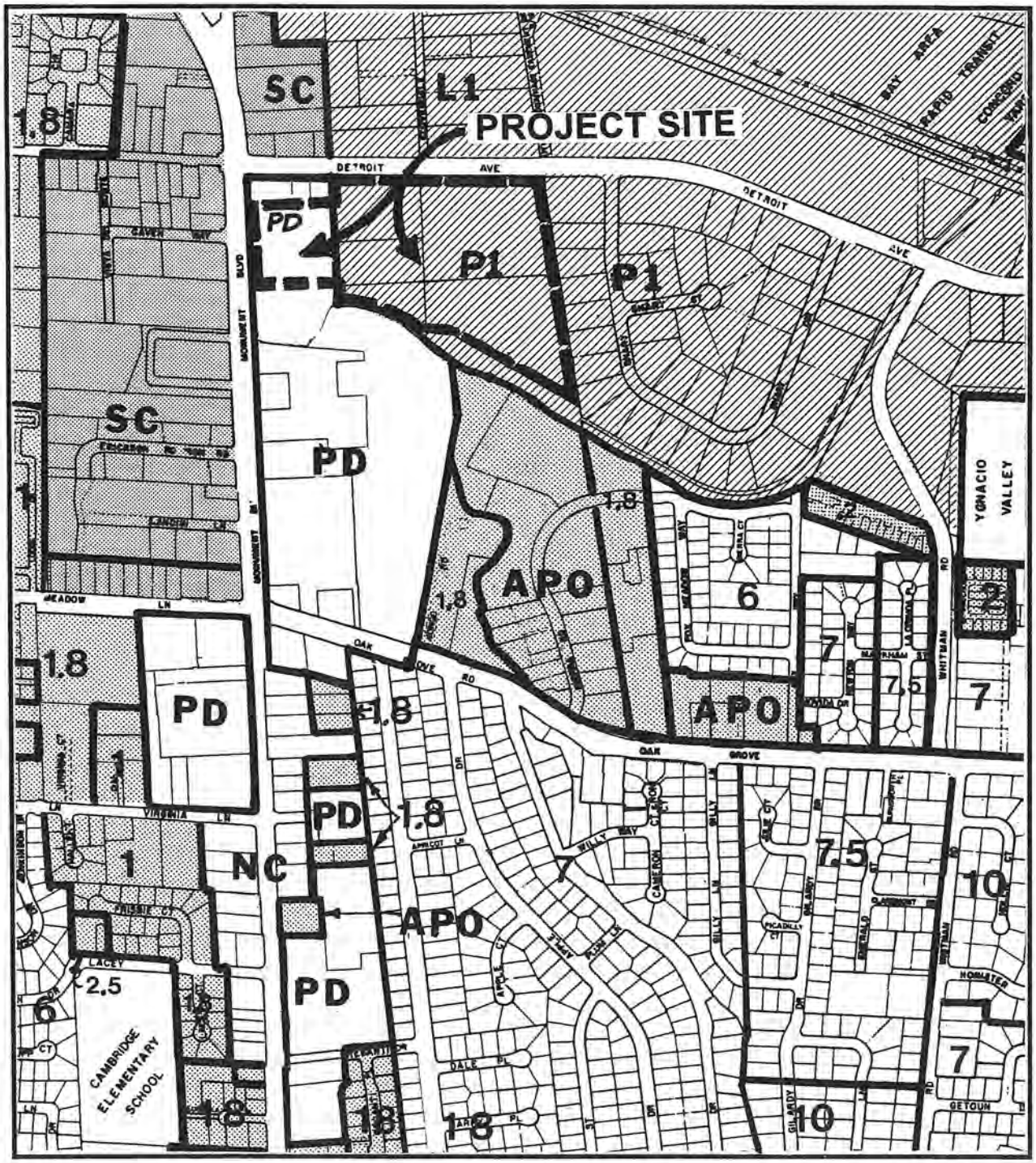
Implementation of the project will require rezoning of the site from Planned Industrial to Planned Development.

GENERAL PLAN

The City of Concord General Plan states that its purpose is to implement goals and policies to shape Concord's future as it enters the twenty-first century. The mission of the General Plan is to guide the development of an orderly, safe and enriching community by directing and guiding future development; conserving and enhancing existing development; encouraging a wide spectrum of housing opportunities; fostering business development; encouraging mutual participation to implement the general plan—public/public and public/private; providing the basis for neighborhood planning which includes the values and concerns of residents; assuring the necessary infrastructure to serve existing and future development and working with neighboring jurisdictions to manage growth and resolve regional and subregional issues.

The City's General Plan contains several components known as elements. These include: Land Use; Growth Management; Transportation/Circulation; Public Services; Parks, Open Space, and Conservation; Public Health and Safety; and Housing. State law requires that all parts of the General Plan comprise an integrated, internally consistent and compatible statement of policies. Thus, in reviewing a development proposal, it is necessary to review all of these elements. Relevant policies related to land use are discussed below. Policies related to traffic/circulation, public health and safety, and biological resources are discussed in relevant sections throughout Chapter 4.

The City's General Plan has also been influenced by a countywide voter initiative that provides a context for countywide planning and development. Measure C, passed by the voters in 1988, requires the City to have an adopted growth management element. This element establishes levels of service for traffic capacity, sewers, flood control, and other public services.



Graphic Scale

0 700' 1400' 2800'

Source: Mills Associates

ZONING MAP LEGEND

6-40*	Single Family Residential
PD	Planned District
.2	Floor Area Ratio (FAR)
2.5	Med. Density Apts. M2.5
1.8	Med. Density Apts. M1.8
1	High Density Apts. M1
APO	Apt. & Professional Office
PI	Planned Industrial
LI	Light Industrial
SC	Service Commercial
NC	Neighborhood Commercial

Figure 3-1 Zoning Map

As shown on Figure 3-2 the project site is designated in the General Plan as Industrial/Business Park with a Regional Commercial overlay designation. The purpose of the Regional Commercial overlay designation is to expand and enhance existing regional commercial uses. The Regional Commercial designation contains large-scale (generally greater than 80,000 square feet) commercial uses that serve both residents and the surrounding region. These uses typically require excellent accessibility and locations near freeway interchanges. Regional commercial uses tend to be large in scale.

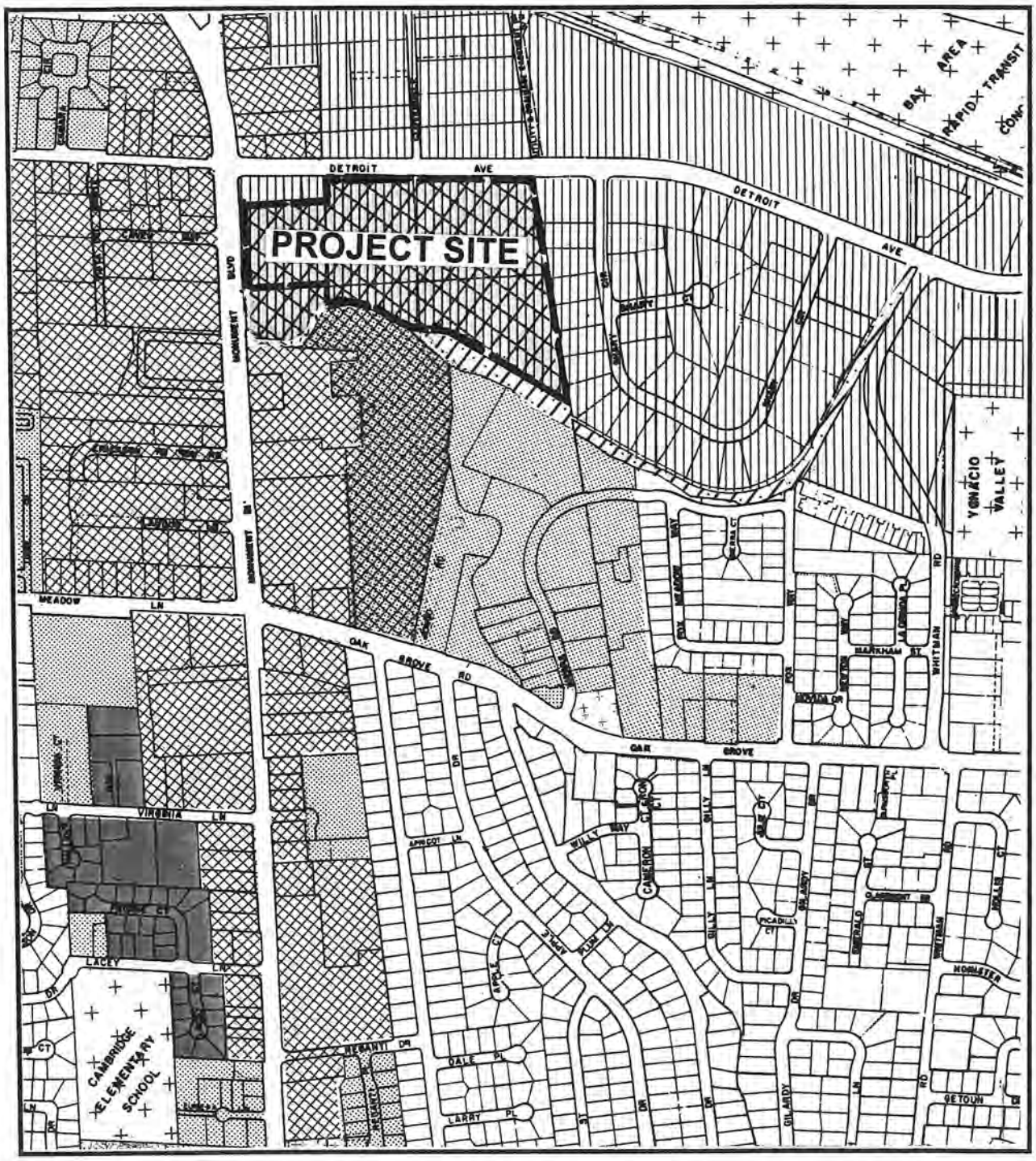
The Industrial/Business Park designation provides a mix of light industrial, office, bulk retail, commercial, recreation, and service uses. Typical uses include warehouse, research and development, wholesale, bulk retail, and office space with limited customer access.

The Land Use Element of the City General Plan contains a variety of goals, objectives and policies. Table 3-1 presents the goals, objectives and policies relevant to the proposed project and a discussion of the project's consistency. It should be noted that consistency occurs with mitigation implemented.

REGIONAL PLANS AND POLICIES

Several regional plans influence development in the City of Concord:

- The Contra Costa Transportation Authority administers the Congestion Management Plan (CMP) and Action Plans for Routes of Regional Significance.
- The Bay Area Air Quality Management District (BAAQMD) developed an air quality management plan that was prepared in cooperation with the Association of Bay Area Governments (ABAG) and the Metropolitan Transportation Commission (MTC) to address attainment of federal and state air quality standards. The relevant policies of the plan are addressed in Section 4.3 - Air Quality.
- The Contra Costa Certified Unified Program Agency (CUPA) has responsibility for permitting the underground storage tanks that would be located on site. The CUPA requirements are discussed in Section 4.6 - Hazards.
- Contra Costa County Fire Protection District (CCCFPD) will review and approve the installation of the underground gasoline storage tanks, installation and operation of the gasoline dispensers and associated valves and piping, high-piled storage of combustible materials, storage and handling of flammable liquids, storage and handling of aerosol products, and tire storage. The permitting process is discussed in Section 4.6 - Hazards.
- The San Francisco Bay Regional Water Quality Control Board (RWQCB) administers the National Pollution Discharge Elimination System (NPDES) for the region. This is addressed in Section 4.2 - Drainage.



General Plan Legend

- Low Density Residential
- Medium Density Residential
- High Density Residential
- Industrial / Business Park
- Regional Office
- Regional Commercial
- Neighborhood/Community Commercial
- Public/Quasi-Public
- Open Space
- Parks

Graphic Scale

0 700' 1400' 2800'

Source: Mills Associates

Figure 3-2 General Plan

Table 3-1
Project Consistency with General Plan Land Use Goals and Policies

Goal/Objective/Policy	Consistency As Mitigated	Discussion
Goal 3 Regional Commercial *Promote and enhance Concord's role as a regional shopping destination*	Consistent	The project reinforces this goal as it will draw customers from the region.
Objective 3.1 Enhance existing uses *Expand and enhance existing regional commercial uses.*	Consistent	The proposed project if implemented would contribute to meeting this objective.
Policy 3.1.1 Support the expansion of existing regional commercial centers as well as development opportunities for new regional commercial centers.	Consistent	The proposed project is considered a regional commercial facility. Implementation of the project would comply with this policy.
Goal 6 Industrial Use *Sustain the existing viable industrial base and encourage new, job-producing activities.*	Consistent	The project will produce new jobs. The existing industrial base would not be affected.
Objective 6.2 Industrial/Business Park *Ensure that development within industrial/business park areas is compatible in terms of function, appearance, and safety concerns.*	Consistent	The function of a Costco facility would be compatible. The appearance is bulkier than surrounding structures, but with additional landscaping the bulk can be minimized.

Table 3-1 *(cont.)*

Goal/Objective/Policy	Consistency As Mitigated	Discussion
Policy 6.2.3 In areas designated for industrial/business park uses, the following types of retail uses may be allowed: c) High volume, warehouse, and/or discount retail uses where adequate parking and safety for the general public can be assured, and where the addition of the use will not interfere with industrial uses within the area.	Consistent	Adequate parking has been provided (refer to Transportation/Circulation section) and the use will not interfere with other uses in the area.
6.2.4 High volume, warehouse retail, and/or discount retail, and/or highway-oriented retail may be permitted in mixed use business parks. Criteria used to judge the appropriateness of such uses shall include: a) Potential of the proposed use to disrupt the activities of adjoining uses. b) Potential exposure of the public to hazardous conditions, whether existing at present or reasonably foreseeable in the future. c) Adequate separation of truck and heavy vehicle traffic from passenger car traffic; and d) Aesthetic impacts on major transportation routes, such as the State Route 4 corridor.	Consistent	The facility has direct access to major city streets. To reduce potential safety conflicts with customer traffic, truck deliveries are primarily scheduled during non-store hours. A truck route on site has been identified to separate truck traffic from passenger traffic. Aesthetic impacts have been addressed in Section 4.8.
6.25 Sites with particularly good street access and high public visibility may be permitted to have high intensity sales or service uses (comparable to regional commercial uses). Certain locations will not be suitable for high intensity uses due to the Concord fault, Airport restrictions, or other safety constrains.	Consistent	The site has good street access with high public visibility. The project site is located approximately one-quarter mile from the fault, and is therefore, not a factor in siting the Costco facility at the project site. The site is also not located in the airport zone. There are no other known safety restrictions that would preclude such a development as that proposed.

Table 3-1 *(cont.)*

Goal/Objective/Policy	Consistency As Mitigated	Discussion
Goal 14 Neighborhood Planning *Sustain long-term livability of Concord neighborhoods*	Consistent	The project would be consistent with surrounding land uses, providing mitigation measures as detailed in Chapter 4 are implemented as a part of the project.
Policy 14.1.6 Landscaping, setbacks, and other appropriate buffers will be required between different types of uses, such as residential and non-residential or low- and medium-density residential.	Consistent	Landscaping and setbacks have been provided between the site and the residential neighborhood.
Objective 14.5 Monument Boulevard *Enhance and balance commercial and residential development, and preserve the distinct commercial and residential districts with frontage on Monument Boulevard as follows:* *B) From Meadow Lane to a point opposite Reganti Drive on the north side of Monument Boulevard and from Detroit Avenue to a point approximately 400 feet west of Reganti Drive on the south side of Monument Boulevard - businesses primarily serving the immediate residential neighborhoods and secondarily serving the regional retail market.*	Consistent	The proposed project can accommodate both local and regional needs.

Table 3-1 *(cont.)*

Goal/Objective/Policy	Consistency As Mitigated	Discussion
Policy 14.5.2 Within the business area (area "B" in Objective 14.5) provide a mix of uses which are predominately oriented toward the needs of people who live nearby, yet allow flexibility so that uses which serve a larger area can be accommodated in the Monument Boulevard area.	Consistent	The proposed project is located within Area B and would serve both local and regional needs.
Objective 14.6 Monument Boulevard Image *Improve the appearance of development along Monument Boulevard in order to provide a more positive image within the City and to improve Concord's image at this important City entry.*	Consistent	The Monument Boulevard entrance to Costco will be landscaped with a mix of trees. Building is set back more than 600 feet from Monument Boulevard.
Policy 14.6.1 *Both new development and renovations of existing development will be required to meet a standard of design excellence comparable to that expected in the Central Area.*	Consistent	The building design incorporates features as identified in the Community Design Guidelines to minimize the building mass. Mitigation calling for additional landscaping at the building walls will further reduce the feeling of building bulk and bring the building more into human scale as called for in the Guidelines.

Table 3-1 ***(cont.)***

Goal/Objective/Policy	Consistency As Mitigated	Discussion
Policy 14.6.2 *The City shall implement street beautification projects to increase landscaping along Monument Boulevard and to improve the pedestrian environment functionally and aesthetically.*	Consistent	The project sponsor proposes a generous landscape pallette consisting of a mix of trees, shrubs, accent plants on the Monument Boulevard frontage. This would complement the new landscaping in the Monument Boulevard median strip.
Objective 14.7 Residential areas in proximity to Monument Boulevard. *Improve neighborhood livability by addressing traffic concerns, recreation needs, and concerns about the relationships between commercial development, multifamily residential development, and single-family residential development.*	Consistent	Traffic mitigations include installation of two traffic signals (at the intersection of Detroit Avenue/Whitman Road and at the project entrance on Detroit Avenue), extending an existing left-turn lane and adding an additional left-turn lane, and rephasing the traffic signal at Monument Boulevard/Detroit Avenue. These mitigations will improve the traffic flow in the project area.

4

ENVIRONMENTAL SETTING, IMPACTS AND MITIGATION MEASURES

4
ENVIRONMENTAL SETTING, IMPACTS, AND MITIGATION MEASURES

4.1 LAND USE AND LAND USE COMPATIBILITY

Setting

The project site is surrounded by a variety of land uses that range in size from small personal services, such as hair salons, to the large chain supermarket. The area also has a number of auto-related businesses, such as gas stations, automotive repair and auto parts stores. The various land uses are identified on Figure 4.1-1. Residential units abut the project site in the southwest corner separated by the Pine Creek channel. The Shary Business Park abuts the southern boundary. Immediately adjacent to the site on the northern boundary is a vacant paved lot which has housed a temporary trailer sales operation. This can be seen in View A of Figure 4.1-2.

View B is of a commercial plaza located directly across the site on Detroit Avenue that houses such uses as a cabinet shop. Views C and D show land uses along Detroit Avenue, beginning at the Detroit/Monument intersection. View E depicts the small neighborhood grocery store located at the northwest corner of Detroit and Monument. Two shopping plazas are located on Monument Boulevard in close proximity to the project site. The nearest plaza contains the Safeway Supermarket and a hardware store and is located directly across the drainage channel from the project site. The plaza was designed in the mission-style architecture, common in Contra Costa County in the mid-1960's. The buildings are single-story with overhangs, built of wood with a tile roof. A portion of the plaza can be seen in View F. Views G and H are of newer contemporary buildings that were constructed recently. View H is of the new shopping plaza recently completed and located at the northwest corner of Oak Grove Road and Monument Boulevard. The City completed a street improvement program and the new landscaping is now planted in the median strips along Monument Boulevard.

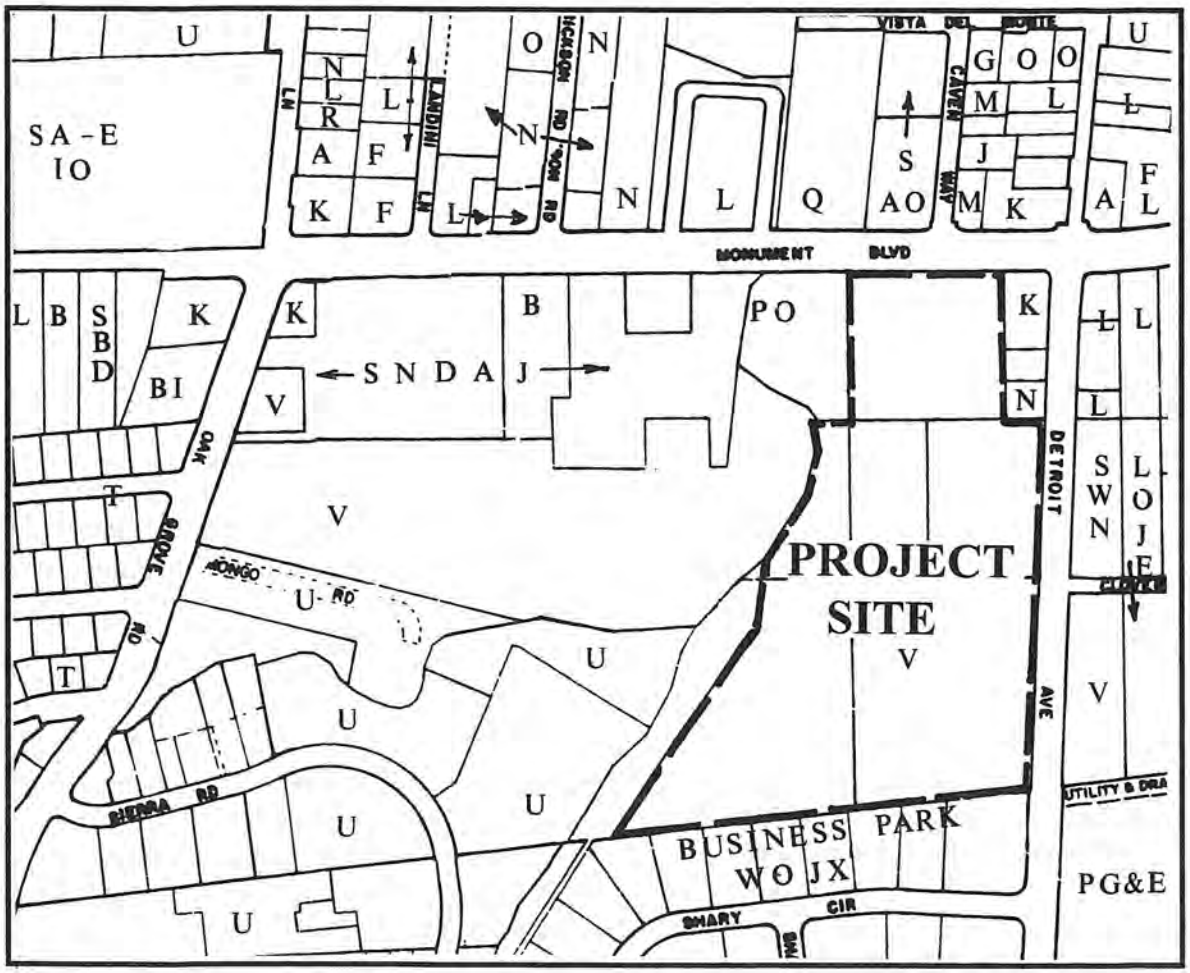
The project site is one of the last remaining large parcels in this section of Concord that is easily accessible. The site is large enough to accommodate the warehouse commercial use or it can accommodate several smaller buildings typical of an industrial/business park. The site is also easily accessible, unlike the 15+ acre site directly west of the site.

Impacts and Mitigation Measures

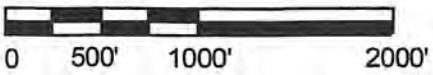
Significance Criteria

This analysis uses criteria from Appendix G (Significant Effects) of the State CEQA Guidelines and standard professional practice to determine the level of significance of the environmental impact. An impact is considered to be significant if the project would:

- Substantially conflict with or be incompatible with existing adjacent land uses.



Graphic Scale



Legend shows primary land use categories.
*Plaza denotes multi use, key tenant uses are shown on plaza parcels.

Source: Mills Associates

Land Use Legend

A	Grocery	M	Machinery / Equipment
B	Restaurant	N	Hardware / Building
C	Clothing	O	Specialty
D	Variety	P	Storage
E	Beauty	Q	Trailer Park
F	Rental	R	Health
G	Recreation	S	Plaza*
H	Entertainment	T	S.F. Residential
I	Liquor	U	Multi Residential
J	Office	V	Vacant
K	Gas Station	W	Printing
L	Auto Related	X	Technology

Figure 4.1-1 Land Uses in Project Vicinity

View A Looking south from Monument Blvd. towards proposed Costco site

View B Looking east from proposed Costco site, across Detroit Avenue to commercial plaza

Source: Mills Associates

Figure 4.1-2 Views of Existing Conditions

View C Looking southeasterly from Monument Blvd. and Detroit Avenue

View D Looking further southeasterly from - C above: area shown is across Detroit Avenue from the project site

Source: Mills Associates

Figure 4.1-2 Views of Existing Conditions (Continued)

View E Looking at a grocery store on the Northeast corner of Monument Blvd. and Detroit Avenue

View F Looking at a plaza on the southern side of Monument Blvd.

Source: Mills Associates

Figure 4.1-2 Views of Existing Conditions (Continued)

View G Looking at the northerly side of Monument Blvd., between Detroit Avenue and Meadow Lane

View H Looking at the Lucky Plaza on the Northwest corner of Monument Blvd. and Meadow Lane.

Source: Mills Associates

Figure 4.1-2 Views of Existing Conditions (Continued)

Project Details

The project entails the construction of a 155,837-square-foot commercial bulk/retail/wholesale facility containing a tire center, food court and gas station. The building ranges between 27'4" and 30'8" high. A three-island gas service station will be located in the southwest portion of the site. Access to the site is from Monument Boulevard and Detroit Avenue. The building exterior will be of concrete masonry block, scored in places to break up the building facade. Steel frame canopies hang over the smaller "non" public entrances on the eastern and southern elevations, as well as over the roll-up door for the tire center. The building is sited to face into the site. The entrance is located in the northwest corner of the building. Along the entrance elevation building articulation has been provided, but is generally lacking on the rear and side elevations. The site can accommodate 1,013 cars. The parking lot will be illuminated with 35-foot-tall light standards each containing two, 1000-watt metal halide lamps contained within 26-inch square boxes. Landscaping will be provided around the perimeter of the site, around the building and throughout the parking lot. This will consist of a mix of evergreen, shade and accent trees, as well as shrubs and grass.

Project Impacts

IMPACT 4.1-1: The Costco building would be out of scale with the adjoining properties and with many of the buildings in the project vicinity. This is a *potentially significant* impact.

The Costco structure contains 155,837 square feet and measures 468 feet by 333 feet with the longer elevation fronting on Detroit Avenue. The building has been sited close to Detroit Avenue to avoid potential impacts on the residents of the Sierra Gardens condominium development, yet sited far enough from the roadway edge to permit a landscaping pallette of street trees, evergreens, shrubs and accent trees. The building mass has limited articulation along the side and street elevations. The landscaping will help to minimize the bulk. The buildings in the immediate vicinity and on Monument Boulevard are of a smaller scale. Even the new development at the corner of Oak Grove Road and Monument Boulevard has varying heights and articulation which is in keeping with architecture in the area.

Mitigation measures recommended to reduce the building's visibility will also help to minimize its bulk and mass.

- **MITIGATION MEASURE 4.1-1A:** The project sponsor shall revise project plans to include additional trellises along the eastern wall to the left and right of the middle section where two trellises are currently proposed.

MONITORING

Mitigation Implementation:	*Project Sponsor*
Monitoring Requirement:	*Confirm revision to landscape plan incorporating additional trellises on eastern wall*

Responsibility for Monitoring: *City Planning Division*
Timing: *Prior to use permit approval*

❑ **MITIGATION MEASURE 4.1-1B:** The project sponsor shall incorporate additional architectural treatment or landscaping on the southern and western elevations where large expanses of blank wall are visible. This can include the use of trellises, the planting of additional trees next to the building, or scoring the concrete and painting the wall with a darker tone.

MONITORING
Mitigation Implementation: *Project Sponsor*
Monitoring Requirement: *Confirm revision of plans for southern and western elevations incorporating the use of trellises, planting of additional trees, or addition of architectural treatment*
Responsibility for Monitoring: *City Planning Division*
Timing: *Prior to use permit approval*

IMPACT 4.1-2: The parking lot lights and service station canopy lights will create glare impacts for residents of the Sierra Gardens condominiums who overlook the site. This is a *potentially significant* impact.

Residents of the Sierra Gardens condominiums presently view a darkened vacant parcel. This nighttime view will be significantly altered with development of the project site. Residents will be directly impacted by the glare created by the parking lot lights and those contained within the gas station area. Although all of the lights point downward, nonetheless the intensity of the lighting will increase the nighttime lighting in the area and the Sierra Garden residents will experience a glare from these lights. The landscape plan proposes a tree screen along the western property line to help block out the glare. However, until the trees reach maturity, the light standards will be considerably higher than the trees and the tree screen will be ineffective.

A review of the lighting plan indicates that the wattage proposed for the parking lot is excessive given that this is a stand alone structure. The type of lighting proposed by the project sponsor is typical of a shopping center complex and not a single structure. Reducing the wattage and lowering the light standards would greatly reduce the glare that will be experienced by the adjacent residents.

❑ **MITIGATION MEASURE 4.1-2:** The project sponsor shall reduce the wattage of the parking lot lights as well as install shorter light standards that do not exceed 30 feet. Two, 400-watt bulbs could be used on 30-foot-tall light poles.

MONITORING
Mitigation Implementation: *Project Sponsor*

Monitoring Requirement:	*Confirm that appropriate reductions in wattage and pole height have been made on lighting plan. Conduct on-site inspection prior to occupancy.*
Responsibility for Monitoring:	*City Planning Division*
Timing:	*Review plan prior to use permit approval and conduct site inspection prior to issuance of occupancy permit*

IMPACT 4.1-3: Construction-related impacts would occur without implementation of mitigation measures.

Site preparation and grading activities would generate dust in the project vicinity as well as noise associated with heavy, diesel-powered machinery. The City of Concord Grading Ordinance requires that all graded or excavated surfaces and materials be wetted, protected or contained in such a manner to prevent nuisances from dust or spillage upon neighboring properties or streets. A grading permit would be issued for site preparation. Air quality impacts as a result of construction activities are discussed in Section 4.3.

Noise impacts associated with construction/grading activities are discussed in Section 4.7. Construction of the project will temporarily increase noise levels at the condominium complex. The construction period is expected to last 120 to 150 days. Typical hourly average construction noise levels are 75 dBA to 80 dBA when measured at a distance of 100 feet from the construction site. Such levels at times would exceed the significance thresholds at the nearest residence.

❑ **MITIGATION MEASURE 4.1-3A:** The project sponsor shall ensure that the following measures are included in construction contracts to control fugitive dust emissions during demolition of existing structures:

- Water during demolition of structures and break-up of pavement to control dust generation.
- Cover all trucks hauling demolition debris from the site.

MONITORING

Mitigation Implementation:	*Project Sponsor/Contractor*
Monitoring Requirement:	*Confirm submittal of dust control plan and conduct site visits to confirm plan's implementation*
Responsibility for Monitoring:	*City Current Development Division and City Construction Division*
Timing:	*Plan submitted prior to issuance of grading permit. Inspections shall occur daily during demolition.*

❑ **MITIGATION MEASURE 4.1-3B**: The project sponsor shall ensure that the following measures are included in construction contracts to control fugitive dust emissions during grading and site preparation activities:

- Water all active construction areas at least twice daily and when necessary. Active areas adjacent existing land uses shall be kept damp at all times, or shall be treated with non-toxic stabilizers or dust palliatives.
- Cover all trucks hauling soil, sand, and other loose materials or require all trucks to maintain at least two feet of freeboard.
- Pave, apply water three times daily, or apply (non-toxic) soil stabilizers on all unpaved access roads, parking areas and staging areas at construction sites.
- Sweep daily (preferably with water sweepers) all paved access road, parking areas and staging areas at construction sites.
- Sweep streets daily (preferably with water sweepers) if visible soil material is carried onto adjacent public streets.
- Hydroseed or apply non-toxic soil stabilizers to inactive construction areas.
- Enclose, cover, water twice daily or apply non-toxic soil binders to exposed stockpiles (dirt, sand, etc.).
- Limit traffic speeds on unpaved roads to 15 mph.
- Install tire grates at the site exits to avoid tracking mud from the site onto City streets.
- Install sandbags or other erosion control measures to prevent silt runoff to public roadways.

MONITORING

Mitigation Implementation:	*Project Sponsor/Contractor*
Monitoring Requirement:	*Confirm submittal of dust control plan and conduct site visits to confirm plan's implementation*
Responsibility for Monitoring:	*City Construction Division*
Timing:	*Plan submittal prior to issuance of grading permit. Inspections shall occur twice per week during grading operation.*

❑ **MITIGATION MEASURE 4.1-3C:** The project sponsor shall prepare and implement a noise attenuation plan that will include the following measures:

- Limit construction activity between the hours of 7:00 a.m. and 6:00 p.m. with no construction activity on Sundays or holidays without prior written approval by the Chief of Planning.

- Maintain and muffle all construction equipment powered by internal combustion engines.
- Identify construction equipment staging areas that are 200 feet from residential units.

MONITORING

Mitigation Implementation:	*Project Sponsor/Contractor*
Monitoring Requirement:	*Confirm submittal of noise attenuation plan that addresses: construction hours, use of muffled equipment, and staging of equipment. Conduct site inspection to confirm compliance with plan.*
Responsibility for Monitoring:	*City Construction Division*
Timing:	*Submit plan prior to issuance of grading permit. Conduct on-site monitoring periodically during construction.*

4.2 DRAINAGE

Setting

Area Drainage

The project site is located on the broad alluvial plain that lies to the west of Mt. Diablo. This area slopes in a northerly direction, and is drained by Walnut Creek to the San Joaquin River, upstream of Suisun Bay and San Francisco Bay. Between Walnut Creek and Mt. Diablo, the land slopes from east to west, separated into smaller drainage basins by a series of low ridges that mark the end of the Mt. Diablo foothills. Lime Ridge is located a little more than 2,000 feet north of the site, dividing the Pine Creek watershed to the south from the Galindo Creek watershed to the north.

Pine Creek flows from south to north along the site's westerly boundary, after beginning more than a mile and a half upstream of Detroit Avenue, where it picks up runoff from the land located between Oak Grove Road and Lime Ridge. In the project vicinity Pine Creek has been "improved" to increase its flow capacity through construction of a vertical-walled, concrete-lined channel that roughly follows the line of its natural stream bed. This channel joins Galindo Creek approximately 4,000 feet downstream of Monument Boulevard, and then Galindo Creek joins Walnut Creek approximately one mile downstream of its junction with Pine Creek. Both streams flow through a fully improved concrete channel all the way to Walnut Creek.

The Pine Creek channel, as well as Galindo Creek and Walnut Creek, is primarily owned and maintained by the Contra Costa County Flood Control and Water Conservation District (Flood Control District) (some sections of Pine Creek are privately owned, and so not maintained by the County). It is located within Drainage Zone 3B, which receives a share of County property taxes for maintenance of the various flood control facilities within the zone boundaries. The project site is not located within a "formed" County Drainage Area. Drainage areas are subdivisions of the larger zones that levy fees on new development to fund the upgrade and improvement of existing flood control facilities. As a result, the proposed project would not be charged a drainage impact fee by the County.

Because Pine Creek is completely lined with concrete, the only significant contributions of storm water runoff are through direct storm drain connections. Two major lines enter the channel on either side of the project site, along its east and west boundaries (for the purposes of this report, it is assumed that Monument Boulevard runs north/south, and Detroit Avenue runs east/west). The easterly line begins on San Miguel Road and runs generally west south, gradually increasing in size to 42 inches in diameter by the time it reaches Detroit Avenue at the northeast corner of the site. It continues south through a drainage easement along the property lines of the neighboring developed industrial parcels, increasing in size to 48 inches where it is joined by a tributary pipe from Shary Circle. The pipe then continues another 400 feet to its discharge into the Pine Creek channel. Based on topographic maps and City drainage plans, it is estimated that this system drains a total area of approximately 148 acres, which includes nearly 40 acres of undeveloped grasslands located uphill from the Contra Costa Canal on the slopes of Lime Ridge. In general, open space runoff is intercepted by the canal, so it probably does not reach Pine Creek in this area. However, the Flood Control District normally ignores these losses when calculating stream flows,

because they could be routed under the canal and back into the stream network at some time in the future. The remainder of the watershed primarily consists of developed residential neighborhoods on the north side of Detroit Avenue. It does not appear that any runoff from the project site currently enters this storm drain system before it reaches the Pine Creek channel.

The existing storm drain line on the west side of the site also begins on San Miguel Road, crosses under BART, then runs west on Cloverdale Avenue and south on Monument Boulevard to its discharge into Pine Creek. A flap gate on the end of the 54-inch diameter culvert prevents high flows in the creek channel from backing up into the storm drain system. Topographic maps indicate that this line drains a total area of approximately 110 acres, although nearly 30 acres consists of grasslands above the Contra Costa Canal on Lime Ridge. South of the canal, the culvert's drainage area includes about 80 acres of commercial and residential properties, mostly on the east side of Monument Boulevard. The only portion of the project site that now drains into this system appears to be the previously developed frontage properties along Monument Boulevard, encompassing just under two acres.

The only sign of developed drainage improvements on the site is a deep roadside ditch that runs along less than half of the Detroit Avenue frontage. This ditch picks up surface drainage from the site as well as the flow from a partially crushed metal pipe that carries runoff under Detroit Avenue. A pair of abandoned culverts runs a short distance into the site from the ditch, but there is no sign of a connection to the Pine Creek channel. With no functioning outlet, it is likely that the ditch holds water throughout most of the rainy season, providing little drainage relief for the site or for the properties on the north side of Detroit Avenue. The City's Master Drainage Plan has proposed construction of a new storm system that would drain the southerly end of Cloverdale Avenue and its intersection with Detroit Avenue, and then make a direct connection to the Pine Creek channel. Preliminary designs show the pipe running in a straight line across the project site, beginning at a point half way between Cloverdale and Monument Boulevard. There are no plans delineating this proposed system's watershed, but it appears that it would provide a natural outlet for a substantial portion of the project site.

The area south of Pine Creek, roughly bounded by Fox Way and Monument Boulevard, is drained by two main pipe systems. One picks up the flow from Diaz Creek, a now mostly buried tributary of Pine Creek that begins south of Oak Grove Road, on the northeast side of a low rise that separates it from the Walnut Creek watershed. The other begins at the southerly end of Peach Way and discharges into Pine Creek underneath the bridge at Monument Boulevard.

Site Description and Topography

The project site drops gradually from east to west, following the fall of Pine Creek. A low hill covers the eastern third of the property, rising five to eight feet above the site perimeter along Detroit Avenue, Pine Creek and the adjoining Shary Circle development. Existing slopes are very gentle, creating a hummocky topography with no clearly defined runoff patterns. Surface soils are predominately Sycamore silty clay loams, which have moderately slow permeability. However,

since slopes are so flat, runoff is characterized as slow. Runoff is also slowed by the soils' loose, broken surface, which supports a heavy growth of annual grasses and a few trees.

Rainfall and Runoff

The San Francisco Bay region's climate can be characterized as Mediterranean, with wet winters and dry summers. In the vicinity of the project site, mean annual rainfall equals approximately 17 inches, with at least 75 percent of this total occurring during the October through March rainy season. The Flood Control District uses a 10-year recurrence interval storm for drainage areas smaller than one square mile, and a 25-year storm for areas between one and four square miles. It is estimated that the Pine Creek watershed encompasses more than one square mile upstream of Monument Boulevard, so the 25-year design requirement would apply. Peak rainfall intensity in the project vicinity for a 15-minute duration, 25-year recurrence interval rainstorm equals 1.76 inches per hour, while for a 6-hour duration, 100-year recurrence interval rainstorm the intensity equals approximately 0.45 inches per hour.[1]

Storm water runoff is that portion of rainfall that is not absorbed into the ground, taken up by plants, or lost through evaporation. Coarse-grained, permeable soils and heavy vegetative cover reduce runoff, while steep slopes, fine grained soils, and impervious surfaces (buildings and pavement) increase runoff. The duration, frequency, and total amount of rainfall also affect the volume of runoff; frequent and/or heavy rains saturate the soil and reduce infiltration, causing the percentage of rain that runs off the land to increase with the severity of a storm. Based on the topographic and soil characteristics described above, it is estimated that the project area has a composite site runoff coefficient of approximately 0.40. This means that up to 60 percent of rainfall is absorbed directly into the soil or remains standing on the surface for some time after a storm has passed.

Because the site is so level, with no direct discharge routes for storm water runoff, it is expected that the velocity of storm water runoff is very low. As a result, there is probably little erosion of on-site soils into the Pine Creek channel.

Flooding

None of the land lying north of Pine Creek, including the project site, is located within a 100-year flood zone, as delineated on the Federal Emergency Management Agency's current Flood Insurance Rate Maps. These maps indicate that all stream flows would remain within the defined channel during a 100-year recurrence interval storm, and there would be no flooding caused by runoff backing out of the contributing storm drain systems. According to representatives of the Flood Control District, the Pine Creek channel was designed with sufficient capacity to accommodate complete build-out of its watershed, so even when the surrounding area is fully developed, there should be no significant flooding impacts either upstream or downstream of Monument Boulevard.[2]

The only flooding documented by FEMA in the project vicinity is on the south side of Pine Creek, where a 100-year flood zone covers a few small areas that drain to the Diaz Creek system. This

flooding pattern suggests that it is caused by insufficient capacity within pipes that drain to the main line culverts, rather than by constraints in the Pine Creek channel.

Officials with the City Engineering and Transportation Department did not report any significant flooding problems within the areas that drain to Pine Creek in the vicinity of the project site. However, minor flooding has occurred along an open ditch section of the Monument Boulevard system north and east of the site. It is expected that completion of a pipe installation project, currently under construction, will resolve this situation.[3]

Water Quality

The project site is currently vacant, with no apparent sources of surface water pollution. As noted above, it is unlikely that there is significant erosion of surface soils into area storm drains or Pine Creek.

Water quality in California is regulated by the U.S. Environmental Protection Agency's National Pollution Discharge Elimination System (NPDES), which controls the discharge of pollutants to water bodies from point and non-point sources. In the Concord area, this program is administered by the San Francisco Bay Regional Water Quality Control Board (RWQCB), a division of the State Water Resources Control Board (SWRCB). Federal regulations issued in November 1990 expanded the authority of the RWQCB to include permitting of storm water discharges from municipal storm sewer systems, industrial processes, and construction sites that disturb areas larger than five acres. Because the project site covers more than five acres, the project sponsor would have to obtain a NPDES construction permit from the SWRCB.

In 1994, the RWQCB issued recommendations for New and Redevelopment Controls for Storm Water Programs to define the local regulatory framework and to provide guidelines for construction permitees. These recommendations include policies that define watershed protection goals, set forth minimum non-point source pollutant control requirements for site planning, construction and post-construction activities, and establish criteria for ongoing reporting of water quality control activities. Watershed protection goals are based on policies identified in the San Francisco Bay Basin Water Quality Control Plan (Basin Plan), and the entire program relies on the implementation of "best management practices" that attempt to limit pollutant contact with storm water runoff at its source and to remove pollutants before they are discharged into receiving waters. The California Storm Water Quality Task Force[4] has published a series of best management practices handbooks that can be used to identify the most effective ways to achieve the water quality objectives identified by the Basin Plan for the beneficial uses of surface waters, groundwaters, wetlands and marshes.

The Basin Plan's water quality objectives specify that the presence or concentration of listed, potentially deleterious constituents of surface water runoff shall not cause a nuisance or adversely affect beneficial uses. A partial list of these constituents includes floating material, suspended material, settleable material, oil and grease, biostimulatory substances, sediment, pH, dissolved

oxygen, bacteria, and toxic substances that are lethal to or that produce other detrimental responses in aquatic organisms.[5]

Impacts and Mitigation Measures

Significance Criteria

In accordance with CEQA Guidelines, an impact has been found to be significant if it would result in:

- the exposure of people and structures to new or increased flooding hazards;
- a loss of flood carrying capacities within downstream storm drain facilities and receiving waters; or
- a decline in local surface or groundwater quality as a result of project development.

Project Details

Based upon the preliminary grading plan,[6] it appears that the proposed project would cover as much as 85 percent of the 15.9-acre Costco portion of the site with buildings or pavement. For the purposes of this analysis, it is assumed there would ultimately be a similar degree of coverage on the remaining 5.5 acres. Under these conditions, it is estimated that the overall site's composite runoff coefficient would increase to approximately 0.90, meaning no more than 10 percent of rainfall would be absorbed into the soil or remain ponded on the ground surface for any appreciable time after the end of a storm. This would represent an increase in the peak rate and total volume of runoff from the project site of 225 percent.

There are no plans of the proposed site drainage system at this time, but, according to the project engineer, runoff from most of the site would be collected into a central drainage system, with only limited areas at the north and south ends of the site draining to the existing City storm drain lines.[7] If possible, the central system would be connected to an existing 36-inch diameter culvert that was stubbed out of the Pine Creek channel wall at the time of its construction. This culvert is located approximately 380 feet east of Monument Boulevard, but it is cut off from the project site by a privately-owned parcel that runs along the creek frontage. If the project sponsor cannot obtain an easement across this parcel, a new channel connection would be constructed farther to the east. The culvert would still have to cross a PG&E parcel, but it appears that it could be routed through the southerly end of the existing Walnut Avenue right of way, which now runs through the site from Detroit Avenue to Pine Creek.

Project Impacts

IMPACT 4.2-1: If storm water runoff from portions of the project site are routed into either of the existing City drain lines along the site's east and west boundaries, the resulting peak flow rates could exceed available capacities, resulting in localized flooding along upstream portions of these drainage systems. This is a *potentially significant* impact.

City officials contacted for this report were not able to confirm whether these existing drainage systems were designed to accept runoff from a fully developed project site as well as from their larger, upstream watersheds. If drainage studies were not prepared at the time of each system's construction, the project sponsor would have to perform the calculations needed to determine whether sufficient capacity is available. It appears likely, though, that at least the Monument Boulevard system has little excess capacity, even though the current pipe installation project is expected to correct some minor flooding problems. These existing conditions indicate that the overall system could probably accept no more than a small percentage of the project site's total runoff without causing new upstream flooding. There are no reports of flooding within the areas drained by the pipe that runs along the east boundary of the project site, so it is not known whether this system could accommodate a very large increase in total flow.

❑ **MITIGATION MEASURE 4.2-1**: The project sponsor shall prepare a drainage plan and calculations demonstrating that there shall be no increase in either the rate or total volume of runoff from the project site into the existing storm drain systems along the site's east and west boundaries unless it can be demonstrated that sufficient capacity exists to accommodate the increased runoff. This can be accomplished with either previously prepared drainage studies or by a new study prepared by the project sponsor, in accordance with City design criteria.

MONITORING

Mitigation Implementation:	*Project Sponsor*
Monitoring Requirement:	*Review drainage plan and associated calculations*
Responsibility for Monitoring:	*City Construction Division*
Timing:	*Prior to issuance of grading permits*

IMPACT 4.2-2: Development of the proposed project would prevent future construction of a new drainage outlet to Pine Creek for the Cloverdale Avenue area, as described in the City's Master Drainage Plan. This is a *potentially significant* impact.

Extension of either the existing culvert stub or a new culvert connection from Pine Creek into the central portion of the project site would be consistent with a proposal set forth in the City's Master Drainage Plan. However, if this culvert is not designed to extend across Detroit Avenue, it would preclude any future drainage connection to Cloverdale Avenue.

❑ **MITIGATION MEASURE 4.2-2**: The project's central drainage system shall extend to Detroit Avenue, in the vicinity of Cloverdale Avenue. It shall have sufficient capacity to accommodate the runoff from the Cloverdale Avenue neighborhood, as defined by the City Engineering and Transportation Department, and it shall be routed through a drainage easement that grants the City all required access rights.

MONITORING

Mitigation Implementation:	*Project Sponsor*
Monitoring Requirement:	*Confirm preparation of storm drain design*
Responsibility for Monitoring:	*City Construction Division*
Timing:	*Prior to issuance of grading permits*

IMPACT 4.2-3: If the project's central drainage system cannot be connected to the existing 36-inch diameter culvert stub in the Pine Creek channel, a new connection will have to be installed, which could potentially compromise the integrity of the existing Pine Creek concrete channel. This is a *potentially significant* impact.

The hole needed to insert a new pipe through the channel wall would cut through a substantial amount of reinforcing steel, potentially weakening an undetermined section of concrete. According to a representative with the Flood Control District, the County attempts to limit new connections into its "improved" stream channels to maintain the integrity of the existing concrete walls. Proper design and construction of this connection should effectively eliminate any potential problems, though, and could actually make the wall stronger at this location. However, as part of the County's Flood Control permit process, project sponsor will be required to demonstrate that existing drainage connections are not accessible and/or do not have sufficient excess capacity to accommodate higher rates of post-development runoff.[8]

❑ **MITIGATION MEASURE 4.2-3**: The pipe connection into the Pine Creek channel and all associated modifications of the existing channel walls shall be constructed in accordance with design requirements set forth by the Flood Control District.

MONITORING	
Mitigation Implementation:	*Project Sponsor*
Monitoring Requirement:	*Confirm preparation of design in accordance with all applicable County Flood Control and Water Conservation District design guidelines. Perform field check during construction.*
Responsibility for Monitoring:	*Flood Control District and City Construction Division to review drainage plan. Construction Division to perform field check.*
Timing:	*Plan prepared prior to issuance of grading permit. Inspection periodically during construction.*

IMPACT 4.2-4: Soil erosion would be expected to increase during project construction. This is a *potentially significant* impact.

Site preparation and grading activities could cause an increase in soil erosion which would enter nearby drainage channels. Because project development would disturb more than five acres, the project sponsor would have to obtain an NPDES general construction permit from the State Water Resources Control Board. The terms of this permit require applicants to prepare a Storm Water Pollution Prevention Plan (SWPPP) to demonstrate that project development would not cause any increase of sedimentation, turbidity, or hazardous materials concentrations within downstream receiving waters. The City Engineering And Transportation Department would monitor implementation of the project's approved SWPPP, with a particular focus on construction period erosion control. Soil erosion will occur when the existing vegetative cover is stripped and the ground surface is regraded, and immediately following construction, when replanted vegetation is taking root.

Following the completion of project construction, the likelihood of on-site erosion would be virtually eliminated, because all disturbed areas would be stabilized underneath buildings, pavement, and landscaping. As a result, it is not expected there would be any significant threat of long-term erosion or downstream sedimentation resulting from project development.

❑ **MITIGATION MEASURE 4.2-4**: The project sponsor shall prepare a Storm Water Pollution Prevention Plan to control erosion on the project site during construction.

Design requirements and implementation measures for project-specific erosion and sedimentation controls would be set forth in the project sponsor's SWPPP, in accordance with State and RWQCB design standards. It is recommended that the plan, at a minimum, include the following provisions:

- Leave existing vegetated areas undisturbed until construction of improvements on each portion of the development site is actually ready to commence.
- Immediately revegetate or otherwise protect all disturbed areas from both wind and water erosion upon the completion of grading activities.
- Collect storm water runoff into stable drainage channels, from small drainage basins, to prevent the buildup of large, potentially erosive storm water flows.
- Direct runoff away from all areas disturbed by construction.
- Use sediment ponds or siltation basins to trap eroded soils before runoff is discharged into on-site or off-site drainage culverts and channels.
- To the extent possible, schedule major site development work involving excavation and earth moving for construction during the dry season.
- Develop and implement a program for the handling, storage, use and disposal of fuels and hazardous materials. The program should also include a contingency plan covering accidental hazardous material spills.

It has been demonstrated that these measures, when properly designed and implemented, can have a significant effect on the quality of storm water runoff from construction sites. Further design and implementation recommendations are included in the Construction Handbook of Best Management Practices.[9]

MONITORING

Mitigation Implementation:	*Project Sponsor*
Monitoring Requirement:	*Confirm preparation of SWPPP and approval by RWQCB. City to field check implementation of plan.*
Responsibility for Monitoring:	*RWQCB and City Construction Division*
Timing:	*SWPPP must be approved prior to issuance of grading permit. Field checks shall occur periodically during construction.*

IMPACT 4.2-5: The quality of storm water runoff from the developed project site would be expected to decline, resulting from an increase in the production of non-point source urban pollutants. This is a *potentially significant* impact.

In commercial areas, non-point source pollutants include litter, landscaping fertilizers and pesticides, packaging materials and heavy metals, oil and gas residues, tire fragments and debris normally deposited by vehicular traffic. Storm water runoff from developed areas would carry

these pollutants into surface waters, where they would cause a small, but cumulative degradation of water quality.

The Contra Costa Countywide Clean Water Program, which is enforced by the City Engineering And Transportation Department, includes typical source control measures such as painting "Drains to the Bay" labels on storm drains, enforcing strict prohibitions on the use or disposal of contaminants within public parking areas, prohibiting the use of non-biodegradable fertilizers and pesticides, restricting vehicle maintenance and washing to areas not connected to the storm drain system, and regular cleaning and maintenance of all streets and parking areas, particularly at the onset of the rainy season, to reduce the build-up of the urban pollutants and debris that are normally washed into storm drains. On commercial and industrial sites, source controls also include reducing, to the extent possible, the volume of storm water discharged from developed sites through the use of pervious pavement or infiltration basins.

Pre-discharge treatment measures are put in place to remove the storm water contaminants that bypass source controls. These are normally designed in accordance with "best management practices," and generally fall into two categories. The first is media filtration, in which runoff is routed through filters to remove suspended sediments, and through oil/water separators, which skim floating grease, petroleum products and debris from the surface of runoff. These devices are installed in individual catch basins, or the runoff from a series of catch basins is routed through a single, large structure that performs the same function. Both facilities require regular inspection, cleaning and the disposal of trapped contaminants, and so are often better suited for implementation on commercial properties, since there is usually a single ownership responsible for area-wide maintenance.

The second category of pre-discharge treatment relies on temporary detention in small ponds or vegetative filtration in gently sloping swales to achieve contaminant removal. Ponds temporarily hold back storm water runoff (similar to what occurs in detention ponds), giving sediments a chance to settle out before offsite discharge, while grass-lined swales pick up contaminants as the water slowly flows across the surface.

The project proposes to implement a pavement sweeping program as a source control and to install commercially available filters in all on-site catch basins to satisfy the City's pre-discharge treatment requirements.[10] Although these measures are consistent with typical Clean Water Program requirements, they do not include provisions for on-site infiltration. Infiltration can effectively supplement catch basin filters by holding back the first flush of runoff (which generally contains the highest concentration of pollutants) until it gradually seeps into the non-potable, upper groundwater table.

- ❑ **MITIGATION MEASURE 4.2-5A**: The project sponsor shall prepare a plan for regular maintenance and long-term implementation of its Clean Water Program responsibilities, for approval and monitoring by the City Engineering and Transportation Department.

MONITORING

Mitigation Implementation:	*Project Sponsor*
Monitoring Requirement:	*Confirm preparation and implementation of long-term SWPPP maintenance plan*
Responsibility for Monitoring:	*City Construction Division*
Timing:	*Approve plans prior to issuance of grading permit. Inspect as needed thereafter.*

❑ **MITIGATION MEASURE 4.2-5B**: The drainage system and site plan shall be configured to provide infiltration areas throughout the project to capture the "first flush" of storm water runoff, in accordance with the recommendations set forth in the Bay Area Stormwater Management Agencies Association "Start at the Source" design guidance manual.

MONITORING

Mitigation Implementation:	*Project Sponsor*
Monitoring Requirement:	*Confirm location of infiltration areas on site plan and conduct periodic inspections*
Responsibility for Monitoring:	*City Construction Division*
Timing:	*Confirm location prior to issuance of grading permit. Inspect as needed thereafter.*

[1] Contra Costa County Flood Control and Water Conservation District, "Mean Seasonal Isohyets and Precipitation Duration-Frequency-Depth Curves," 1977.

[2] Mary Holly, Contra Costa County Flood Control and Water Conservation District, personal communication, August 5, 1999.

[3] Robert Clarke, City of Concord Engineering and Transportation Department, personal communication, May 21, 1999.

[4] The State Storm Water Task Force is a committee of the California Chapter of the American Public Works Association.

[5] California Regional Water Quality Control Board, *San Francisco Bay Basin Water Quality Control Plan*, 1986.

[6] Kier and Wright, Civil Engineers and Surveyors, Inc., Preliminary Grading Plan for Costco, dated February 1999.

[7] David Readler, Kier & Wright Civil Engineers and Surveyors, Inc., personal communication, August 5, 1999.

[8] Tom Williams, Contra Costa County Flood Control and Water Conservation District, personal communication, May 26, 1999.

[9] Camp Dresser & McKee, Larry Walker Associates, Uribe & Associates, Resources Planning Associates, for the State Stormwater Quality Task Force (a municipal agency advisory body), "California Storm Water Best Management Practice Handbooks: Construction Activity," March 1993.

[10] *Op. cit.*, David Readler, August 5, 1999.

4.3 AIR QUALITY

Setting

Air Basin Characteristics

The climate of the project area is typical of sheltered inland locations in California. Daytime temperatures in summer average near 80 degrees F. Summer diurnal range is high, with temperatures dropping to the low 50's by early morning. Daytime temperatures in winter vary little from the more coastward locations with maxima in the mid-50's. Winter minima, however, are some ten degrees lower on the average than stations on the coast, with early morning temperatures in the low to middle 30's. Sunshine is plentiful in summer, with clear skies most of the time.

Wind speeds in the Diablo Valley are generally light, as the area is sheltered from marine air by coastal hills. During the daytime, there are two predominant flow patterns: an upvalley flow from the north and a westerly flow across the lower elevations of the coastal hills. During winter the area is subject to drainage flows. As the earth's surface cools by radiation, the air near the surface is also cooled. This cooled air is denser than surrounding air, and in hilly terrain will be affected by gravity such that the cooler air travels along drainages and watercourses in the downstream direction.

The pollution potential in the project area is relatively high compared to other portions of the Bay Area. On winter evenings, light winds combined with surface-based inversions and terrain that restricts air flow can cause pollutant levels to build up. In summer, ozone and ozone precursors are often transported into the area from within the Bay Area center and the Central Valley.

Air Quality Standards

State and national ambient air quality standards have been established for the following pollutants: ozone, carbon monoxide, nitrogen dioxide, sulfur dioxide, suspended particulate matter (PM_{10}) and lead. For some of these pollutants, notably ozone and PM_{10}, the State standards are more stringent than the national standards. The State has also established ambient air quality standards for sulfates, hydrogen sulfide, vinyl chloride and visibility reducing particles. The above-mentioned pollutants are generally known as "criteria pollutants." Table 4.3-1 identifies the major criteria pollutants, characteristics, health effects and typical sources. The federal and state ambient air quality standards and their attainment status are summarized in Table 4.3-2.

In addition to the criteria pollutants discussed above, Toxic Air Contaminants (TACs) are another group of pollutants of concern in the Bay Area. Toxic Air Contaminants (TACs), are injurious in small quantities and are regulated despite the absence of criteria documents. The identification, regulation and monitoring of TACs is relatively recent compared to that for criteria pollutants.

Sources of TACs include industrial processes, petroleum refining and chrome plating operations, commercial operations such as gasoline stations and dry cleaners, and motor vehicle exhaust. Health effects of TACs include cancer, birth defects, neurological damage and death.

Table 4.3-1
Major Criteria Pollutants

Pollutant	Characteristics	Health Effects	Major Sources
Ozone	A highly reactive photochemical pollutant created by the action of sunshine on ozone precursors (primarily reactive hydrocarbons and oxides of nitrogen. Often called photochemical smog.	• Eye Irritation • Respiratory function impairment.	The major sources ozone precursors are combustion sources such as factories and automobiles, and evaporation of solvents and fuels.
Carbon Monoxide	Carbon monoxide is an odorless, colorless gas that is highly toxic. It is formed by the incomplete combustion of fuels.	• Impairment of oxygen transport in the bloodstream. • Aggravation of cardiovascular disease. • Fatigue, headache, confusion, dizziness. • Can be fatal in the case of very high concentrations.	Automobile exhaust, combustion of fuels, combustion of wood in woodstoves and fireplaces.
Nitrogen Dioxide	Reddish-brown gas that discolors the air, formed during combustion.	• Increased risk of acute and chronic respiratory disease.	Automobile and diesel truck exhaust, industrial processes, fossil-fueled power plants.
Sulfur Dioxide	Sulfur dioxide is a colorless gas with a pungent, irritating odor.	• Aggravation of chronic obstruction lung disease. • Increased risk of acute and chronic respiratory disease.	Diesel vehicle exhaust, oil-powered power plants, industrial processes.
PM_{10}	Solid and liquid particles of dust, soot, aerosols and other matter which are small enough to remain suspended in the air for a long period of time.	• Aggravation of chronic disease and heart/lung disease symptoms.	Combustion, automobiles, field burning, factories and unpaved roads. Also a result of photochemical processes.

Table 4.3-2
Federal and State Ambient Air Quality Standards

Pollutant	Averaging Time	Federal Primary Standard	State Standard
Ozone	1-Hour 8-Hour	0.12 ppm 0.08 ppm	0.09 ppm --
Carbon Monoxide	8-Hour 1-Hour	9.0 ppm 35.0 ppm	9.0 ppm 20.0 ppm
Nitrogen Dioxide	Annual 1-Hour	0.05 ppm --	-- 0.25 ppm
Sulfur Dioxide	Annual 24-Hour 1-Hour	0.03 ppm 0.14 ppm --	-- 0.05 ppm 0.5 ppm
PM_{10}	Annual 24-Hour	50 $\mu g/m^3$ 150 $\mu g/m^3$	30 $\mu g/m^3$ 50 $\mu g/m^3$
$PM_{2.5}$	Annual 24-Hour	15 $\mu g/m^3$ 65 $\mu g/m^3$	-- --
Lead	30-Day Avg. Month Avg.	-- 1.5 $\mu g/m^3$	1.5 $\mu g/m^3$ –

ppm = Parts per Million
$\mu g/m^3$ = Micrograms per Cubic Meter

Current Air Quality

The project is within the San Francisco Bay Air Basin. The local air quality agency, Bay Area Air Quality Management District (BAAQMD), operates a network of permanent monitoring sites throughout the Bay Area including one in Concord.

Table 4.3-3 shows a summary of violations of ambient air quality standards recorded at the Concord monitoring site during the six-year period 1992-1997. All federal standards except that for ozone were met at the Concord monitoring site during the period. Violations of the more stringent state ozone standard were also recorded in each year, as were violations of the state standard for PM_{10}.

Sensitive Receptors

The Bay Area Air Quality Management District defines sensitive receptors as facilities where sensitive receptor population groups (children, the elderly, the acutely ill and the chronically ill)

Table 4.3-3
Summary of Air Quality Data for Concord, 1992-1997

Pollutant	Standard	Number of Annual Violations in:					
		1992	1993	1994	1995	1996	1997
Ozone	State 1-Hour	3	7	4	9	11	2
Ozone	Federal 1-Hour	0	2	0	3	1	0
Carbon Monoxide	State 1-Hour	0	0	0	0	0	0
Carbon Monoxide	State/Federal 8-Hour	0	0	0	0	0	0
PM_{10}	State 24-Hour	8	2	4	1	1	2
PM_{10}	Federal 24-Hour	0	0	0	0	0	0
Sulfur Dioxide	State 24-Hour	0	0	0	0	0	0
Nitrogen Dioxide	State 1-Hour	0	0	0	0	0	0

Source: California Air Resources Board, *California Air Quality Data*, Annual Summaries, 1992-1997.

are likely to located. These land uses include residences, schools playgrounds, child care centers, retirement homes, convalescent homes, hospitals and medical clinics. There is one sensitive receptor near the project site: multi-family housing located south and west of the project site. This residential area is separated from the project site by a flood control channel. All other land uses adjacent the project site are commercial or industrial.

General Plan

The Public Health and Safety Element of the City of Concord General Plan contains several air quality policies and programs. The following four objectives are identified:

- Develop and maintain a balanced transportation system that includes opportunities for non-automobile transportation.
- Improve air quality and minimize air pollution impacts.
- Utilize land use planning strategies that can help minimize air pollution emissions.
- Continue to support Federal, State, and regional efforts to improve air quality in order to protect human and environmental health.

Impacts and Mitigation Measures

Significance Criteria

The Bay Area Air Quality Management District's document *BAAQMD CEQA Guidelines*[1] establishes the following significance criteria for air quality:

- A project contributing to carbon monoxide (CO) concentrations exceeding the State Ambient Air Quality Standard of 9 parts per million (ppm) averaged over 8 hours or 20 ppm for 1 hour would be considered to have a significant impact.
- A project that generates criteria air pollutant emissions in excess of the BAAQMD annual or daily thresholds would be considered to have a significant air quality impact, both singularly and cumulatively. The current thresholds are 15 tons/year or 80 pounds/day for Reactive Organics Gases (ROG), Nitrogen Oxides (NO_x) or PM_{10}.
- Any project with the potential to frequently expose members of the public to objectionable odors would be deemed to have a significant impact.

Any project with the potential to expose sensitive receptors or the general public to substantial levels of toxic air contaminants would be deemed to have a significant impact.

The BAAQMD significance threshold for construction dust impacts is based on the appropriateness of construction dust controls. The BAAQMD guidelines provide feasible control measures for construction emission of PM_{10}. If the appropriate construction controls are to be implemented, then air pollutant emissions for construction activities would be considered less than significant.

Project Impacts

IMPACT 4.3-1: Construction activities such as demolition, excavation and grading operations, construction vehicle traffic and wind blowing over exposed earth would generate exhaust emissions and fugitive particulate matter emissions that would affect local air quality. This is a *potentially significant* impact.

The Monument Boulevard frontage of the project sites contains existing structures. The physical demolition of existing structures is a construction activity with a high potential for creating air pollutants. In addition to the dust created during demolition, substantial dust emissions could be created as debris is loaded into trucks for disposal. Additional emissions would be created by trucks carrying debris to disposal sites, but this emission would be spread over the roadway network rather than occurring on site.

After removal of existing structures, construction dust would continue to affect local air quality during construction of the project. The dry, windy climate of the area during the summer months creates a high potential for dust generation. Clearing, grading and earthmoving activities have a high potential to generate particulate matter and dust whenever soil moisture is low and particularly when the wind is blowing.

The effects of construction activities would be increased dustfall and locally elevated levels of PM_{10} downwind of construction activity. Construction dust has the potential for creating a nuisance at nearby properties.

Emissions of particulate matter or visible emissions are regulated by the Bay Area Air Quality Management District under Regulation 6 "Particulate Matter and Visible Emissions." Specifically, visible particulate emissions are prohibited where the visible particulates are deposited on real property other than that of the person responsible for the emissions and cause annoyance. This regulation is applicable to construction sites, but no monitoring is normally conducted unless the District receives complaints.

The following mitigation measures are required to reduce the impact to a level that is less than significant.

- ❑ **MITIGATION MEASURE 4.3-1A:** The project sponsor shall ensure that the following measures are included in construction contracts to control fugitive dust emissions during demolition of existing structures:
  - Water during demolition of structures and break-up of pavement to control dust generation.
  - Cover all trucks hauling demolition debris from the site.

MONITORING

Mitigation Implementation:	*Project Sponsor/Contractor*
Monitoring Requirement:	*Confirm submittal of dust control plan and conduct site visits to confirm plan's implementation*
Responsibility for Monitoring:	*City Construction Division*
Timing:	*Plan submitted prior to issuance of grading permit. Inspections shall occur daily during demolition.*

❑ **MITIGATION MEASURE 4.3-1B**: The project sponsor shall ensure that the following measures are included in construction contracts to control fugitive dust emissions during grading and site preparation activities:

- Water all active construction areas at least twice daily and when necessary. Active areas adjacent existing land uses shall be kept damp at all times, or shall be treated with non-toxic stabilizers or dust palliatives.
- Cover all trucks hauling soil, sand, and other loose materials or require all trucks to maintain at least two feet of freeboard.
- Pave, apply water three times daily, or apply (non-toxic) soil stabilizers on all unpaved access roads, parking areas and staging areas at construction sites.
- Sweep daily (preferably with water sweepers) all paved access road, parking areas and staging areas at construction sites.
- Sweep streets daily (preferably with water sweepers) if visible soil material is carried onto adjacent public streets.
- Hydroseed or apply non-toxic soil stabilizers to inactive construction areas.
- Enclose, cover, water twice daily or apply non-toxic soil binders to exposed stockpiles (dirt, sand, etc.).
- Limit traffic speeds on unpaved roads to 15 mph.
- Install tire grates at the site exits to avoid tracking mud from the site onto City streets.
- Install sandbags or other erosion control measures to prevent silt runoff to public roadways.

MONITORING

Mitigation Implementation:	*Project Sponsor/Contractor*
Monitoring Requirement:	*Confirm submittal of dust control plan and conduct site visits to confirm plan's implementation*

Responsibility for Monitoring: *City Construction Division*
Timing: *Plan submittal prior to issuance of grading permit. Inspections shall occur twice per week during grading operation.*

IMPACT 4.3-2: Traffic generated by the project would increase local carbon monoxide concentrations. This is a *less-than-significant* impact.

On the local scale the pollutant of greatest interest is carbon monoxide. Concentrations of this pollutant are related to the levels of traffic and congestion along streets and at intersections.

The CALINE-4 computer simulation model was applied to four intersections near the project site. These intersections were selected as worst-case locations, either based on absolute traffic volumes, congestions levels or incremental traffic increase due to the project. The CALINE-4 program and the assumptions made in its use are described in Appendix C.

The results of the CALINE-4 modeling for the four selected intersections are shown in Table 4.3-4. Concentrations are shown for three scenarios:

- Existing traffic
- Existing Plus Project Traffic
- Existing Plus Project Plus Cumulative Traffic

Table 4.3-4
Worst Case Carbon Monoxide Concentrations Near Selected Intersections, in PPM

Intersection	Existing		Existing + Project		Existing + Project + Cumulative	
	1-Hr	8-Hr	1-Hr	8-Hr	1-Hr	8-Hr
Monument Boulevard./ Detroit Avenue	10.4	7.3	11.3	7.9	11.9	8.3
Monument Boulevard/ Meadow Lane	10.3	7.2	10.8	7.6	10.8	7.6
Monument/Gallindo/ Cowell/Oakmead	9.8	6.9	10.3	7.2	10.3	7.2
Most Stringent Standard	20.0	9.0	20.0	9.0	20.0	9.0

The concentrations in Table 4.3-4 are to be compared to the state and federal ambient 1-hour air quality standards of 20 ppm and 35 ppm. Predicted 8-hour concentrations in Table 4.3-4 are to be compared to the state and federal 8-hour standards of 9 ppm.

Existing concentrations meet all ambient air quality standards. The addition of project traffic would increase concentrations by as much as 0.9 ppm, but concentrations would remain well below the applicable standards. The addition of cumulative traffic would further increase concentrations, but not to levels that exceed the state/federal ambient air quality standards. The impact of the project on local carbon monoxide concentrations is considered to be less than significant.

❑ **MITIGATION MEASURE 4.3-2:** None is required.

IMPACT 4.3-3: New traffic generated by the project would increase regional emissions. This impact cannot be fully mitigated and is therefore *significant and unavoidable*.

Project traffic would have an effect on air quality outside the project vicinity. Trips to and from the project would result in air pollutant emissions within the air basin. To evaluate emissions associated with the project, the URBEMIS-7G computer program was employed.

The daily increase in regional emissions from auto travel is shown in Table 4.3-5 for reactive organic gases (hydrocarbons) and oxides of nitrogen (two precursors of ozone), carbon monoxide and PM_{10} (particulate matter, 10 micron). The incremental increase of each of the project constituents is shown. The URBEMIS-7G model and the conditions assumed in its use are described in Appendix C.

The Bay Area Air Quality Management District has established a threshold of significance for ozone precursors and PM_{10} of 80 pounds per day. Project-related emissions from vehicles are well above these thresholds of significance for ozone precursors, so project impacts on regional air quality would be significant.

A point could be made that the Concord store is replacing an existing store and, thus, regional emissions would not significantly change. However, CEQA requires that each site that is proposed for development must be evaluated as a new project even though a use may be relocating. Furthermore, it can be assumed the existing structure in Martinez will continue to be used for either light industrial or commercial uses.

Table 4.3-5
Project Regional Emissions in Pounds Per Day

	Reactive Organic Gases	Nitrogen Oxides	PM_{10}
Costco:			
Store	82.1	145.9	46.4
Gas Station	11.3	20.2	6.4
Tire Center	1.4	2.4	0.8
Food Service	7.6	14.1	4.5
Total	102.4	182.6	58.1
Residual Parcel:			
Light Industrial	6.0	9.7	3.2
Retail	10.6	17.8	5.7
Total	16.6	27.5	8.9
Project Total	119.0	210.1	67.0
BAAQMD Significance Threshold	80.0	80.0	80.0

The suburban location and character of the proposed project limits the potential for further reducing regional air quality impacts. Available air quality mitigation strategies for commercial development focus on work trips, which comprise a very small fraction of total project trips, and thus would not be effective. The big-box discount character of the project also makes impractical any strategies to have patrons use transit, walk or bicycle to the proposed facility. Parking restrictions as a means of reducing vehicle trips are impractical unless imposed regionally and have the potential to adversely impact adjacent neighborhoods.

In summary, there are no effective and available mitigation measures that can reduce project impacts to a level that is below the BAAQMD's significance thresholds. Although the traffic mitigation measures identified in the traffic impact analysis for the project identifies measures to reduce congestion and would, in turn, result in a small reduction in air emissions, these measures would not reduce emissions enough to result in a less-than-significant impact. Project impacts on regional air quality, both singularly and cumulatively, would be significant and unavoidable.

❑ **MITIGATION MEASURE 4.3-3:** No mitigation measure is available.

IMPACT 4.3-4: The project would result in new Toxic Air Contaminant emissions. This is a *less-than-significant* impact.

The project would result in the new emissions of TACs from the site. The gasoline station would be a source of gasoline vapors that would include TACs such as benzene. The second source would be diesel truck exhaust. The California Air Resources Board has recently identified particulate emissions from diesel-fueled engines as a Toxic Air Contaminant (TAC).

Gasoline Vapors

Gasoline vapors are released during the filling of both the stationary underground storage tanks and the transfer from those underground tanks to individual vehicles. The BAAQMD has stringent requirements for the control of gasoline vapor emissions from gasoline dispensing facilities. District Regulation 8, Rule 7 requires all new facilities to install and maintain CARB Certified Vapor Recovery Systems. As a potential source of TACs, a gasoline filling station is subject to the BAAQMD's toxic risk screening and risk management procedures.

The proposed gasoline dispensing facility is roughly 200 feet northeast of the closest residence. Exposure to residents would be quite low because of the following:

- These residences are downwind from the gas station when winds are from the northeast. Wind records from Buchanan Field reveal that winds from this direction are relatively infrequent, occurring about 1.5 percent of the time.
- The permitting procedures of the BAAQMD will require substantial control of emissions, and permits would not be issued unless TAC risk screening or TAC risk assessment can show risks are nonsignificant.

The release of gasoline vapors into the atmosphere from the gas station would have a less-than-significant impact on the health risks to nearby residents.

Diesel Exhaust

The identification of particulate from diesel engines as a TAC required the California Air Resource Board to determine if there is a need for further control. CARB is currently beginning the risk management process that will investigate if cost effective measures are available to reduce public exposure. A ban on diesel-fueled engines is not being considered. In general, emissions of this TAC are trending downward as older diesel engines are replaced by cleaner versions.

The closest residences are over 600 feet from the receiving dock where the majority of truck trips will terminate. Truck deliveries to the Costco facility, including those to the tire center and gasoline station, would be approximately 100 to 110 trips per week, or approximately an average of 14 to 16 trips per day. Also, the load receiving dock area is northeast of the closest residences, so that truck activity would be upwind of these residences only 1.5 percent of the time. For these

reasons, the release of diesel particulate into the atmosphere from trucks on the project site would have a less-than-significant impact on the health risks to nearby residents.

❑ **MITIGATION MEASURE 4.3-4:** None is required.

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[1] Bay Area Air Quality Management District, *BAAQMD CEQA Guidelines*, April 1996.

4.4 TRANSPORTATION/CIRCULATION

Setting

This section describes the existing transportation network in the study area and analyzes the future transportation characteristics that would result from implementation of the proposed Costco Wholesale store. The network to be analyzed consists of roadways that would be directly affected by project-generated traffic, including major regional transportation facilities. The analysis includes on-site circulation issues, project access issues, and pedestrian safety issues.

Analysis Methodology

The traffic analysis consists of Level of Service (LOS) analysis based on volume-to-capacity ratio for signalized intersections. The Contra Costa Transportation Authority Level of Service Analysis Program (CCTALOS) was used for analyzing the signalized study intersections. The operation of unsignalized intersections was evaluated using the Highway Capacity Software (HCS). HCS analysis is based on the average total delay methodology presented in Chapter 10 of the 1994 *Highway Capacity Manual* (HCM). Operational analysis and queuing length requirements near the site access were conducted using TRAFFIX software for signalized intersection and HCS software for the unsignalized intersection.

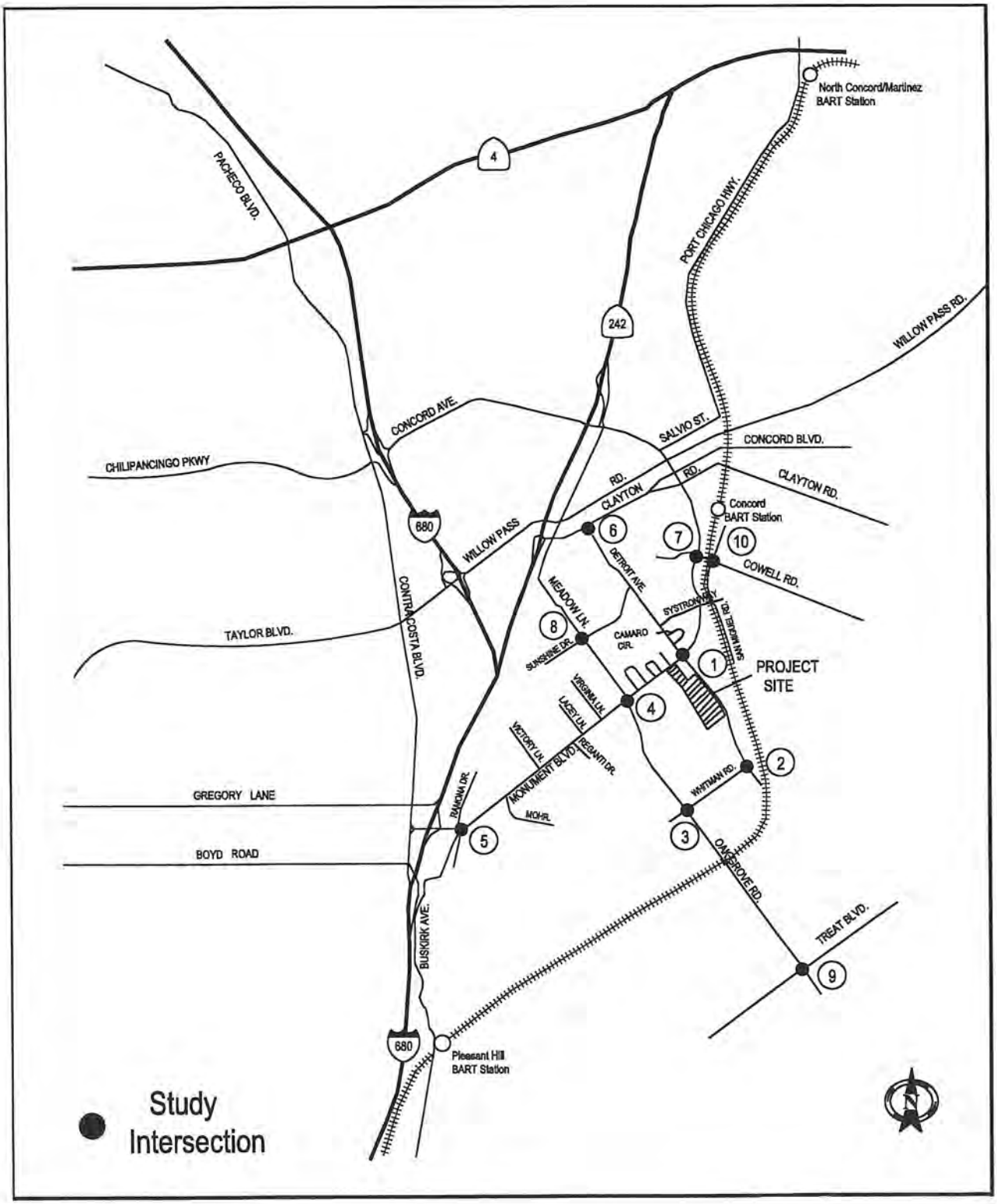
The operating condition of the following scenarios were analyzed for the level of service computations at the study intersections:

- Existing Conditions
- Background Conditions (Existing plus Approved Projects Traffic)
  There are no approved projects by the City of Concord in the vicinity of the project site, hence the background condition volumes and analysis are the same as existing conditions.
- Project Conditions (Existing plus Project Traffic)
- Cumulative Conditions (1 percent annual growth in existing traffic over five years plus project condition traffic).

Study Intersections

The following study intersections, shown on Figure 4.4-1, were selected for the analysis, based on input from the City of Concord Transportation Division:

1. Detroit Avenue & Monument Boulevard
2. Detroit Avenue & Whitman Road
3. Whitman Road & Oak Grove Road
4. Monument Boulevard & Oak Grove Road/Meadow Lane
5. Monument Boulevard & Buskirk Avenue/Ramona Drive
6. Detroit Avenue & Clayton Road
7. Monument Boulevard/Galindo Street & Cowell Road/Oakmead Drive
8. Meadow Lane & Sunshine Drive
9. Treat Boulevard & Oak Grove Road
10. San Miguel Road/Mesa Street & Cowell Road



Source: Rajappan & Meyer

Figure 4.4-1 Study Intersections

All of the study intersections are signalized except the intersection of Detroit Avenue and Whitman Road. The Monument Boulevard/Buskirk Avenue/Ramona Drive intersection lies within the Pleasant Hill city limits.

Level of Service Definition and Criteria

The designation for traffic Levels of Service (LOS) are the letters "A" through "F." LOS A represents free-flow conditions, while LOS F indicates a condition of significant traffic delays and backups. LOS B through E represent conditions of progressively increasing congestion. The LOS is based on volume/capacity (V/C) ratio and delay criteria, as presented in Table 4.4-1 for signalized intersections and Table 4.4-2 for unsignalized intersections. The minimum acceptable intersection level of service standard during peak hours in the City of Concord is V/C of 0.89 which represents level of service D or better. Mitigation is required for intersections operating below this LOS threshold.

Existing Conditions

Roadway Network

Regional access to the project site is provided by Interstate 680 (I-680) and State Route 242 (SR-242). Monument Boulevard, Detroit Avenue, Oak Grove Road, Meadow Lane, and Whitman Road provide local access to the project site. The surrounding roadway network is shown on Figure 4.4-1. Table 4.4-3 presents peak hour and average daily traffic flows at major roadway locations in the vicinity of the project site.

Interstate 680 is a north-south, eight-lane freeway with one lane in each direction designated as a high occupancy vehicle (HOV) lane between Livorna Road exit in Walnut Creek and Alcosta Boulevard exit in Dublin. HOV lanes, also known as diamond lanes or carpool lanes, are restricted for use by vehicles occupied by two or more persons between 6:00 a.m. and 9:00 a.m. and between 3:00 p.m. and 6:00 p.m. I-680 is located to the west of the site and extends from Fairfield in the north to San Jose in the south. Access from I-680 to the project site is provided via its interchanges with Monument Boulevard and Willow Pass Road.

State Route 242 is also a north-south, four-lane freeway, which links Interstate 680 with State Route 4 just north of Concord. Access from SR-242 to the project site is provided via its interchanges with Concord Avenue and Clayton Road in the north.

Monument Boulevard is a major arterial connecting downtown Concord with I-680 and Pleasant Hill. It varies from a four-lane divided cross-section between I-680 and Virginia Lane and six lanes between Virginia Lane and Systron Drive. Along the project site frontage, Monument Boulevard is a six-lane arterial with a median separating the eastbound and westbound travel directions. A 1999 count conducted by the City of Concord staff on Monument Boulevard west of Detroit Avenue shows 16,312 eastbound and 17,882 westbound vehicles per day. Traffic counts also showed that 5 percent of vehicles during the AM peak hour and 3 percent of vehicles during the PM peak hour at the Monument Boulevard/Detroit Avenue intersection are trucks. There are

Table 4.4-1
Signalized Intersection Level of Service Standards
Contra Costa Transportation Authority Methodology

Level of Service	Type of Flow	Delay	Maneuverability	V/C Ratio
A	Stable Flow	Very slight or no delay. If signalized, conditions are such that no approach phase is fully utilized by traffic and no vehicle waits longer than one red indication.	Turning movements are easily made, and nearly all drivers find freedom of operation.	0.00-0.59
B	Stable Flow	Slight delay. If signalized, an occasional approach phase is fully utilized.	Vehicle platoons are formed. Many drivers begin to feel somewhat restricted within groups of vehicles.	0.60-0.69
C	Stable Flow	Acceptable delay. If signalized, a few drivers arriving at the end of a queue may occasionally have to wait through one signal cycle.	Backups may develop behind turning vehicles. Most drivers feel somewhat restricted.	0.70-0.79
D	Approaching Unstable Flow	Tolerable delay. Delays may be substantial during short periods, but excessive backups do not occur.	Maneuverability is severely limited during short periods due to temporary backups.	0.80-0.89
E	Unstable Flow	Intolerable delay. Delay may be great up to several signal cycles.	There are typically long queues of vehicles waiting upstream of the intersection.	0.90-1.00
F	Forced Flow	Excessive Delay	Jammed conditions. Backups from other locations restrict or prevent movement. Volumes may vary widely, depending principally on the downstream backup conditions.	Varies[1]

[1] In general, volume-to-capacity ratios cannot be greater than 1.00, unless the lane capacity assumptions are too low. Also, if future demand projections are considered for analytical purposes, a ratio greater than 1.00 might be obtained, indicating that the projected demand would exceed the capacity.

Sources: *Highway Capacity Manual*, Special Report No. 209, Transportation Research Board, 1985; and *Highway Capacity Manual*, Special Report No. 87, Highway Research Board, 1965. V/C Ratio from the *Contra Costa Transportation Authority.*

Table 4.4-2
Unsignalized Intersection Level of Service Standards
Average Stopped Vehicular Delay

Level of Service	Description	Average Stopped Delay Per Vehicle
A	Little or no delays.	≤5.0
B	Short traffic delays.	5.1 to 10.0
C	Average traffic delays.	10.1 to 20.0
D	Long traffic delays.	20.1 to 30.0
E	Very long traffic delays.	30.1 to 45.0
F	Extreme traffic delays with intersection capacity exceeded causing severe congestion	> 45.0

Source: *Highway Capacity Manual*, Special Report 209, Transportation Research Board, 1994.

Table 4.4-3
Average Daily and Peak Hour Traffic

		Average Daily Traffic (vehicles/day)		Peak Hour Traffic (vehicles/hour)		
Count Location	Direction	Weekday	Weekend	AM	PM	Saturday
Monument Boulevard (West of Detroit Avenue)	Eastbound	16,312	13,323	1,221	863	1,076
	Westbound	17,882	14,118	1,402	1,368	1,033
Detroit Avenue (North of Monument Boulevard)	Northbound	5,634	4,231	227	465	326
	Southbound	6,228	4,592	541	428	344
Detroit Avenue (South of Monument Boulevard)	Northbound	6,392	2,065	378	564	261
	Southbound	7,463	2,565	751	461	246
Oak Grove Road (South of Monument Boulevard)	Northbound	12,600	10,317	968	928	780
	Southbound	12,729	10,609	903	1,069	856
Meadow Lane (North of Monument Boulevard)	Northbound	9,785	8,101	812	817	640
	Southbound	13,682	11,701	872	1,011	781
Whitman Road (East of Oak Grove Road)	Eastbound	3,460	1,719	422	252	123
	Westbound	4,644	2,249	399	336	139

Source: City of Concord, Transportation Division, May 1999.

eight signalized intersections between I-680 and Detroit Avenue. The posted speed limit is 35 mph and Monument Boulevard is a City of Concord designated truck route. Adjacent land uses are primarily commercial and retail.

Detroit Avenue is made up of the following two segments:

Detroit Avenue between Clayton Road and Monument Boulevard is a two-lane road with center left-turn lanes along portions of the road. It becomes a three-lane road (with two-lanes for the northbound movement) between Laguna Street and Clayton Road. Sidewalks are generally provided on both sides through out the length of the segment. This part of Detroit Avenue runs through a predominantly high/medium density residential area. There is a School and Park (Meadow Homes School and Park) located at the corner of Detroit Avenue and Sunshine Drive. Pedestrian/School crossing signs and pavement markings are provided in the immediate vicinity of the School. Crosswalks are also provided near the school at the intersection of Detroit Avenue and Sunshine Drive and students are assisted across the street by a crossing guard. This segment is served by the County Connection Bus Route 114 and bus stops are provided in both directions at various locations along the road. Parking is allowed as well as prohibited at various points along this segment. Average daily traffic on Detroit Avenue north of Monument Boulevard during the weekday is 5,634 northbound and 6,228 southbound vehicles per day.

Detroit Avenue between Monument Boulevard and Whitman Road is a four-lane road between the Monument Boulevard and Cloverdale Road and becomes a three-lane road (with two-lanes for the northbound movement) between Cloverdale Road and Shary Circle. A center two-way left-turn lane between Cloverdale Road and Whitman Road efficiently serves left-turn movements to and from Detroit Avenue. This part of Detroit Avenue serves adjacent commercial and light industrial developments except for the project site, which is vacant. Sidewalks are provided on both sides of the road except at the project site and parking is generally allowed along this segment. Average daily traffic on Detroit Avenue south of Monument Boulevard is 6,392 northbound and 7,463 southbound vehicles per day.

Oak Grove Road is a four-lane arterial connecting Concord with Walnut Creek. Oak Grove south of Monument Boulevard carries 12,600 northbound and 12,729 southbound vehicles per day, based on a 1999 City of Concord count. North of Monument Boulevard, Oak Grove Road becomes Meadow Lane. Oak Grove Road is a City of Concord designated truck route.

Meadow Lane is a collector road located northwest of the project site that becomes Oak Grove Road south of Monument Boulevard. It is a two-lane road with center left-turn lane between Mayette Avenue and the Luck Plaza Driveway and becomes a four-lane road up to the intersection of Monument/Oak Grove/Meadow. All of Meadow Lane serves a predominantly residential area except for the area around Monument Boulevard which is commercial. There are sidewalks on both sides of Meadow Lane. It is served by the County Connection Bus Route 111 and bus stops

are provided along the road in both directions. Parking is prohibited at various sections along Meadow Lane. There is heavy pedestrian activity and significant cyclist activity on Meadow Lane particularly near the Monument Boulevard intersection. Posted speed limit on Meadow Lane is 35 mph. Meadow Lane north of Monument Boulevard carries 9,785 northbound and 13,682 southbound vehicles per day.

Whitman Road is a two-lane collector street to the south of the proposed project site that serves an existing light industrial area. Costco members arriving from the southeast will use Whitman Road. Whitman Road east of Oak Grove Road carries 3,460 eastbound and 4,644 westbound vehicles per day.

Accidents

Analysis of the number of accidents reported during the last four years in the vicinity of the project site was conducted. Accidents were recorded for the following segments:

1) Monument Boulevard (between Oak Grove/Meadow Lane and Detroit Avenue)
2) Detroit Avenue (between Monument Boulevard and Whitman Road)

The results indicated that there were at least 2 pedestrian, 10 bicyclist, and 30 vehicular accidents during the study period. The analysis also indicated that the majority of the accidents were speed related. The average accident rates for the four-year period is based on million vehicle miles of travel (MVM). For the Monument Boulevard section, the average rate is 2.07 MVM which is below the state average of 2.40 MVM for this type of roadway. The average rate calculated for the Detroit Avenue section is 1.13 MVM. The results of the accident analysis are summarized in Table 4.4-4.

Transit, Bicycle, and Pedestrian Facilities

Transit service is provided near the site by *County Connection* Bus Route 114, which also provides service to the Concord BART station via Oak Street . The nearest bus stops for both eastbound and westbound travel are at Detroit Avenue just north of Monument Boulevard. Existing bus service is provided every fifteen minutes during the weekday peak periods and every thirty minutes during the weekday off-peak. Bus frequency is every fifty minutes on Saturdays. The Concord BART station is approximately one mile from the proposed project site.

There are no bike lanes provided in the immediate vicinity of the project site.

Pedestrian facilities consist of sidewalks, crosswalks, and pedestrian signals at signalized intersections. Sidewalks currently exist along the project frontage on Monument Boulevard all the way to the Concord BART station. However, there are no sidewalks on Detroit Avenue in the vicinity of the project site. Crosswalks with pedestrian signals are provided only at the eastbound and westbound approach of the intersection of Monument Boulevard and Detroit Avenue.

Table 4.4-4
Accident Statistics for Project Vicinity

From: / To:	1/1/95 12/31/95	1/1/96 12/31/96	1/1/97 9/30/97[1]	1/1/98 9/30/98[1]	Total
Type of Accident *Involving*	**Number of Accidents By Type**				
Pedestrian	***0***	***1***	***0***	***1***	***2***
Bicyclist	***2***	***1***	***3***	***4***	***10***
Vehicle	***8***	***11***	***6***	***5***	***30***
Total	***10***	***15***	***7***	***10***	***42***

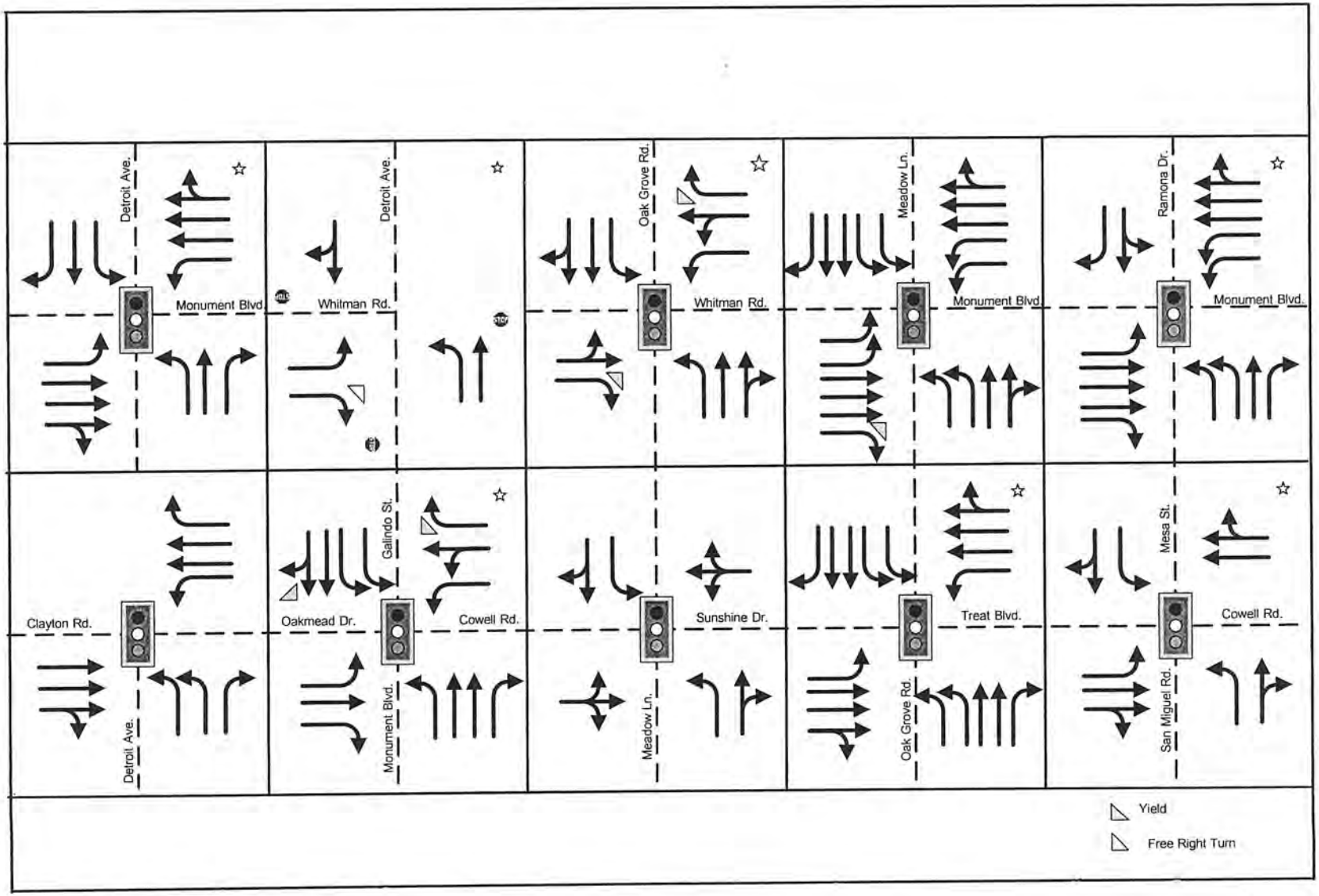
[1] Only nine months of accident data was available for this year.

Source: *Statewide Integrated Traffic Records System (SWITRS)*, Police Traffic Bureau, City of Concord, 1995 - 1998.

Due to the nature of the Costco Warehouse business, it would generate negligible transit, pedestrian, and bicycle based traffic.

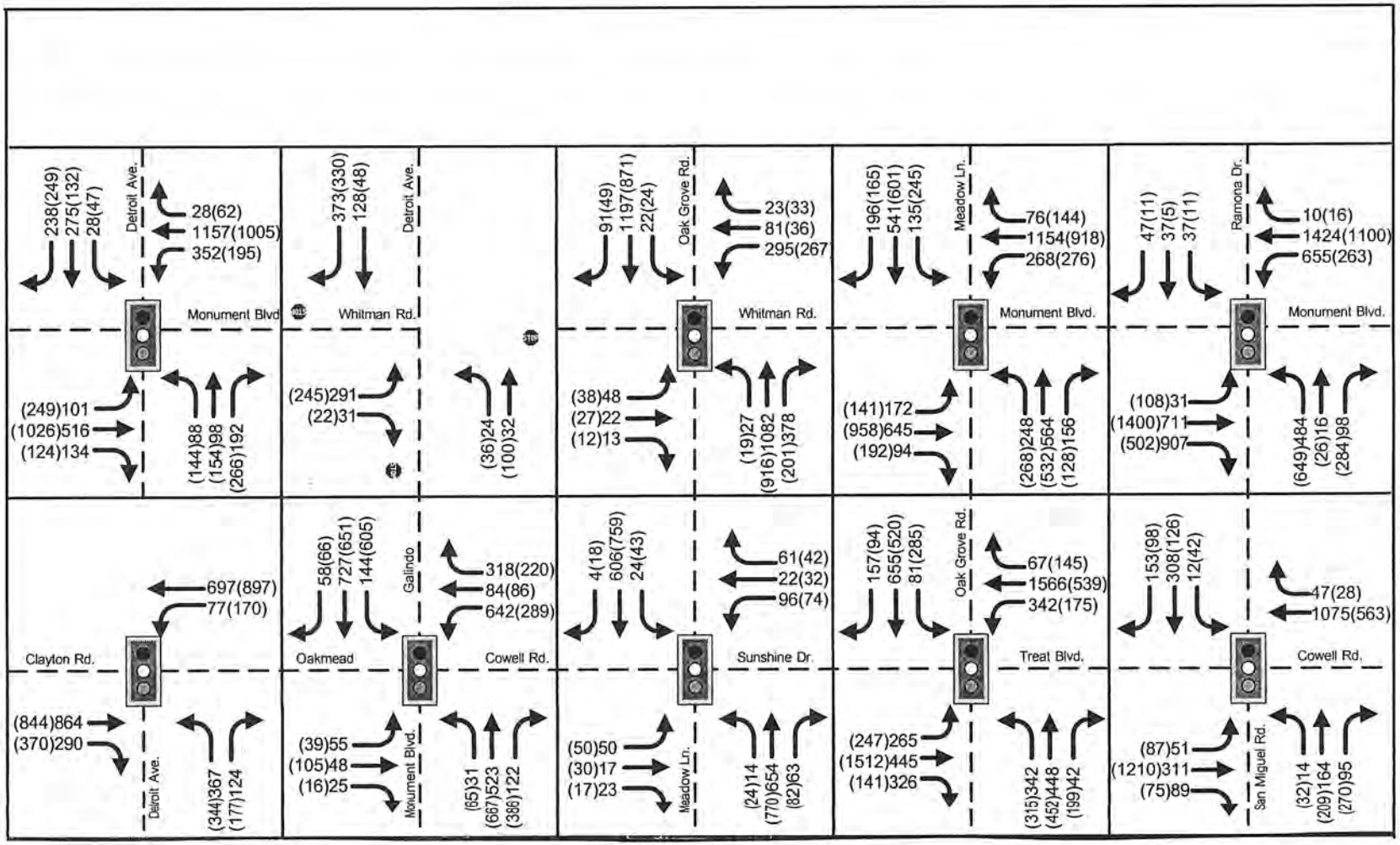
Existing Traffic Volumes and Lane Configuration

AM peak hour, PM peak hour and Saturday peak hour traffic turning movement counts for the ten study intersections were obtained during the months of September/October 1998 and May 1999. Existing lane configurations for the study intersections are shown in Figure 4.4-2. Figure 4.4-3 shows the Weekday AM and PM peak hour turning movement volumes. Figure 4.4-4 shows the Saturday Peak hour turning movement volumes. All traffic counts at the intersections were conducted during the same peak hours (7:00–9:00 a.m. and 4:00–6:00 p.m. for weekday peak hours and 1:00–3:00 p.m. for Saturday PM peak hour). The traffic data analysis indicated heavy trucks make up 5 percent during the AM peak hour and 2 percent during the PM peak hour of traffic along the Monument Boulevard corridor. Therefore, these percentages were applied to through movements at all four study intersections along the Monument Boulevard corridor (Monument Boulevard/Buskirk Avenue/Ramona Drive; Monument Boulevard/Oak Grove Road/Meadow Lane; Monument Boulevard/Detroit Avenue; and Monument Boulevard/ Galindo Street/Cowell Road/Oakmead Drive).



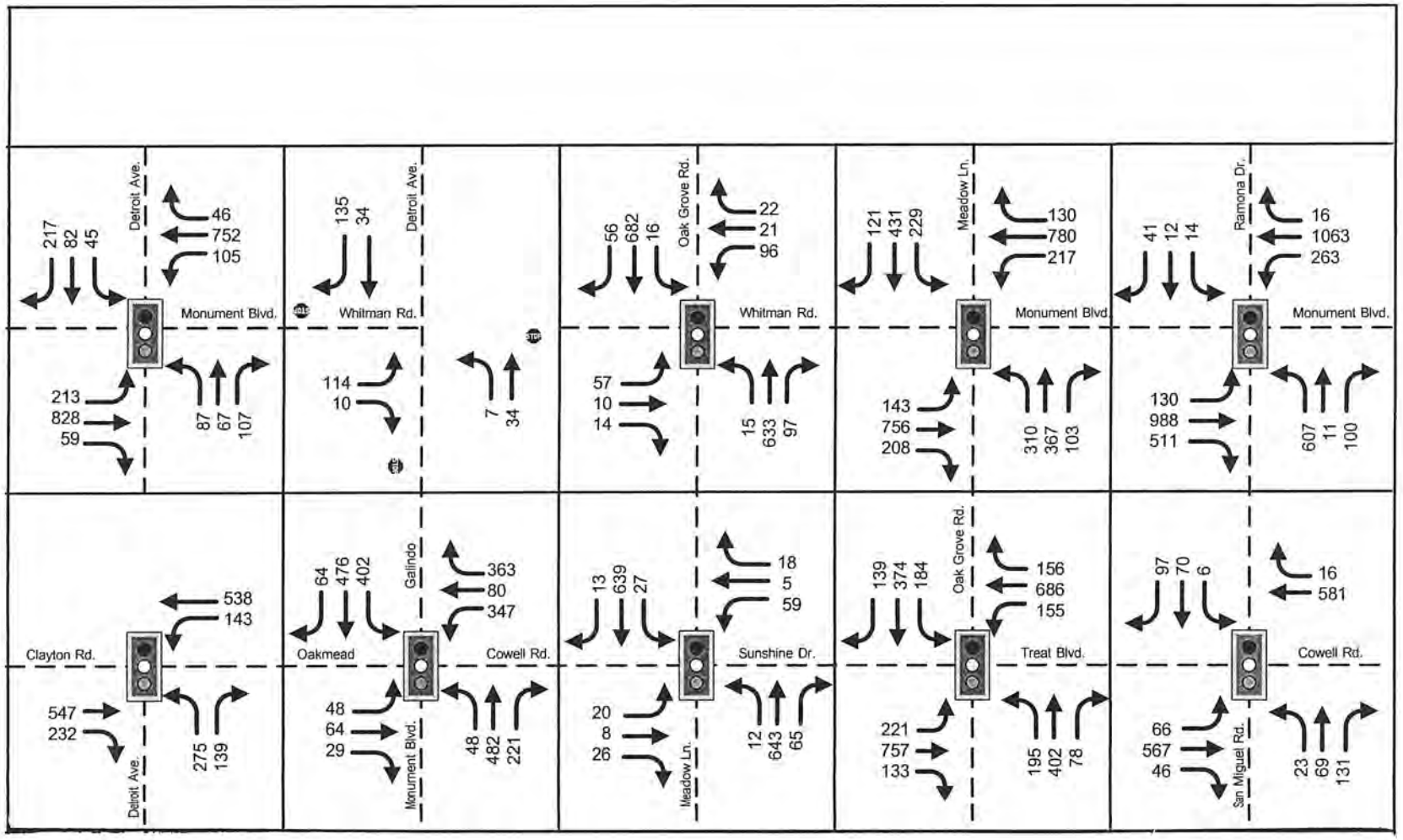
Source: Rajappan & Meyer

Figure 4.4-2 Existing Lane Configuration



Source: Rajappan & Meyer

Figure 4.4-3 Existing Weekday Peak Hour Traffic Volumes



Source: Rajappan & Meyer

Figure 4.4-4 Existing Weekend Peak Hour Traffic Volumes

Field Observations of Existing Traffic Conditions

To supplement and verify the intersection analysis, field observations were conducted at critical intersections within the study area during the AM peak hour, PM peak hour, and Saturday peak hour. Critical intersections were determined based upon proximity of intersections to the project site, estimated percentage of project trips going through the intersection, traffic engineering knowledge of congested intersections, and input from the City of Concord Transportation Division staff. Poor field operations are also presented.

The intersection of Monument Boulevard/Detroit Avenue, Monument Boulevard/Oak Grove Road/Meadow Lane and Monument Boulevard/Galindo Street/Cowell Road/ Oakmead Drive experience relatively good progression, as they are part of a corridor-wide signal coordination system. This greatly improves the through movements and results in acceptable LOS and average intersection delays.

- ***Monument Boulevard / Detroit Avenue.*** The westbound approach of this intersection experiences moderate to high levels of delay during the AM peak hour. The westbound left-turn is very busy, and queues extend beyond the existing left-turn storage lane provided however, the westbound through experiences minimal delay. The eastbound left-turn lane also experiences some delay, but the delays are moderate compared to the westbound left-turn. During the AM peak-period observation, 14 light trucks and 2 heavy trucks were observed at the intersection. The intersection operates well during the Saturday peak period.
- ***Monument Boulevard / Oak Grove Road / Meadow Lane.*** The field observations at this intersection indicated that during the AM peak, northbound double left-turn lane traffic is heavy and traffic backs up to the median opening south of the intersection. Generally, the northbound approach is busy during the AM peak. The westbound approach is also experiencing heavy traffic, and hence some delays. All other approaches are operating at acceptable levels. During the Saturday peak period, all approaches to the intersection appear to be relatively busy. However, traffic at the intersection manages to progress without excessive delays.
- ***Whitman Road / Oak Grove Road.*** The field observations indicated that this intersection is operating relatively well under all observed peak periods. Although northbound and southbound approach traffic is quite heavy, progression is still good, with minor delays.
- ***Monument Boulevard/Galindo Street/Cowell Road/ Oakmead Drive.*** The field observations indicated that this intersection is operating well under all observed peak periods. The northbound and southbound through movements (Monument Boulevard and Galindo Street) experience some back-ups but all vehicles are cleared withing each cycle length without any problems.
- ***Treat Boulevard/ Oak Grove Road.*** Field observations indicate that this intersection is operating near capacity during the AM peak period when school is in session. This traffic congestion causes diversion of traffic into local neighborhood streets. During the weekday PM peak period some queuing was observed at the southbound left and eastbound left-

turn lanes but green time within the cycle length allows adequate progression for both movements. A considerable number of truck movements were observed during both the morning and evening weekday peak periods.

The field LOS differs significantly from the CCTALOS Methodology analysis. This is because the CCTALOS analysis is not able to truly represent the congested approach and queuing that is occurring at the intersections of Monument Boulevard/Detroit Avenue; Monument Boulevard/ Oak Grove Road/Meadow Lane; and Treat Boulevard/Oak Grove Road. Table 4.4-5 presents a summary of field observations at critical intersections. Field observation forms are on file and available for review at the City of Concord Transportation Division.

Corridor Observations

Monument Boulevard

Existing conditions along Monument Boulevard between Cowell Road and Oak Grove Road were observed to help understand mobility and physical conditions that exist in this corridor.

Land Use around the observed stretch of Monument Boulevard consists of commercial, retail, light industrial, and residential land use mix. Most of the residential development is located on the west side between Systron Drive and Cowell Road. There is also a high concentration of multi-family housing from Virginia Lane and Carey Drive on the north side. There are three travel lanes in each direction between Oak Grove Road and Systron Drive and two-lanes in each direction between Systron Drive and Cowell Road.

Flow of traffic is generally good along this stretch of Monument Boulevard, particularly for the through movements. However, some left-turn pockets/lanes along the road experience considerably high levels of delay and queuing during the weekday morning and evening peak hours. Good progression is attributed to the coordination system of traffic signals along the Monument Boulevard as a whole, including the five study intersections in the project area.

Sidewalks are provided on both sides of Monument Boulevard along this section except for the east side between Systron Drive and Cowell Road segment. Pedestrian activity is also medium to heavy on this stretch of road with most of the activity occurring around the signalized intersections.

There are five traffic signals along this stretch of road including the Cowell/Galindo/Oakmead/ Monument and Oak Grove/Meadow/Monument intersections. Crosswalks with pedestrian signals are provided at all signalized intersections. There are bus stops on both sides of Monument Boulevard served by the County Connection Bus Route 114.

There are no bicycle lanes on this section of Monument Boulevard, and bicycle activity is significant with some activity on the sidewalk.

Table 4.4-5
Summary of Intersection Field Observations

No.	Intersection	Field LOS			Comments
		AM Peak	PM Peak	Saturday Peak	
1.	Monument Boulevard / Detroit Avenue	*C-D*	*D*	*B - C*	***AM Peak*** - Westbound left-turning vehicles experience high levels of delay and queuing. Moderate queuing in eastbound left-turn lane. Southbound approach is busy. ***PM Peak*** - Intersection operates fairly well. ***Saturday Peak*** - Intersection operates ok.
4.	Monument Boulevard / Oak Grove Road / Meadow Lane	*C -D*	*D*	*C - D*	***AM Peak*** - Northbound double left-turn lane is quite heavy. A backup of nine cars per lane beyond existing storage lane is observed ***PM Peak*** - Northbound double left-turn lane is quite heavy. A backup of nine cars per lane beyond existing storage lane is observed. ***Saturday Peak*** - Intersection operates ok.
3.	Oak Grove Road / Whitman Road	*A - B*	*B – C*	*A - B*	***AM Peak*** - Six-car backup observed at westbound approach. ***PM Peak*** - Ten-car backup observed at westbound approach. ***Saturday Peak*** - Intersection operates relatively well. Intersection operates well during all observed peak periods.
7.	Monument Blvd./Galindo Street/Cowell Road / Oakmead Drive	*B - C*	*B – C*	*A - B*	***AM Peak*** - Ten-car long queue in the southbound through approach. ***PM Peak*** - Twelve-car long backups observed at northbound through approach. ***Saturday Peak*** - Intersection operates ok.
9.	Treat Boulevard./Oak Grove Road	*B - C*	*C - D*	*B*	***AM Peak*** - Northbound left and westbound left-turn lanes relatively busy. Southbound and westbound are near capacity. ***PM Peak*** - Southbound left and eastbound left-turn lanes relatively busy. ***Saturday Peak*** - Intersection operates ok.

NOTE: A LOS range is provided for the field observation to account for variations in visual traffic characteristics and sudden changes in traffic behavior at the intersections.

Parking is generally not allowed on this stretch of Monument Boulevard except on the west side of Systron Drive and Cowell Road segment adjacent to the residential areas. This is due to the high volume of traffic and the number of driveways off Monument Boulevard.

Monument Boulevard is a City of Concord designated truck route, and truck traffic is evident based on observations. Also, traffic data analysis along Monument Boulevard indicates that trucks make up 6 percent of all vehicles using the corridor.

Detroit Avenue

Existing conditions on Detroit Avenue were observed to help understand mobility and physical conditions that exist in this corridor.

There are two lanes of travel in each direction of Detroit Avenue between Clayton Road and Whitman Road. Detroit Avenue is a parallel route to Meadow Lane and provides a link between Monument Boulevard and Clayton Road for access to the State Route 242 or Willow Pass Road. Traffic flow on Detroit Avenue is good even though it is busy during the morning and evening peak hours. Traffic flow is facilitated by its connection to the signalized intersections with Clayton Road and Monument Boulevard. Detroit Avenue, north of Monument Boulevard, runs through a predominantly high/medium density residential area, and light industrial offices/units can be found south of Monument. Industrial development at the south end of Detroit Avenue at Shary Circle has impact on traffic flows in the morning and afternoon peak periods. Pedestrian activity is significant on Detroit Avenue between Clayton Road and Monument Boulevard, but quite low between Monument Boulevard and Whitman Road. Most pedestrian activity seems to be concentrated around the intersection at Monument Boulevard and Meadow Homes Park. Residents on Detroit Avenue between Laguna Street and Camara Circle have expressed concerns regarding accessing Detroit during peak hours.

County Connection Bus Route 114 serves Detroit Avenue, between Clayton Road and Monument Boulevard, and there are bus stops on both sides of the street. There is some truck traffic on Detroit Avenue, particularly on the segment south of Monument Boulevard. Detroit Avenue, between Clayton Road and Monument Boulevard, is not a City of Concord designated truck route.

Meadow Lane

Existing conditions on Meadow Lane were observed to help understand mobility and physical conditions that exist in this corridor.

Meadow Lane is a two-lane road with center left-turn lane between Mayette Avenue and the Lucky Plaza Driveway and widens to a four-lane road up to the intersection of Monument/Oak Grove/Meadow. All of Meadow Lane serves a predominantly residential area except for the area around Monument Boulevard, which is commercial. There are intermittent sidewalks on both sides of Meadow Lane. County Connection Bus Route 111 serves it, and bus stops are provided along the road in both directions. Parking is prohibited at various sections along Meadow Lane. There is heavy pedestrian activity and significant bicycle activity on Meadow Lane particularly near the Monument Boulevard intersection.

Traffic flow is generally good on Meadow Lane. This road serves as a connection between Monument Boulevard/Oak Grove Road and Market Street to the State Route 242 ramps. Traffic does back up at the Sunshine Drive traffic signal during the commute periods. Meadow Lane is not a City of Concord designated truck route.

Oak Grove Road

Existing conditions along Oak Grove Road between Monument Boulevard and Treat Boulevard were observed to help understand mobility and physical conditions that exist in this corridor.

There are two travel lanes in each direction on Oak Grove Road and it serves as a connection between Walnut Creek and Concord. The Oak Grove Road corridor is heavily traveled during both the AM and PM peak hours. Progression is of reasonable standard, although there is some queuing at the signalized intersections at Monument Boulevard, Whitman Road, Minert Road and Treat Boulevard. County Connection Bus Route 111 serves the Oak Grove corridor with bus stops located on both sides of the road.

Adjacent land uses on this section of Oak Grove road is predominantly residential, with multi-family type concentrated between Whitman and Monument Boulevard and single family type dwelling concentrated between Whitman Road and Treat Boulevard. There is a school located on Oak Grove, between Carthage and Smith Lane. Pedestrian activity along this whole section varies from low to moderate and tends to be concentrated near the intersections associated with schools. Schools on San Simeon Drive, Minert Road, Oak Grove Road, and two high schools on Treat Boulevard have an impact on traffic along the corridor during the morning commute. Parking is prohibited along this section of Oak Grove Road because it is a through route and the roadway width. Oak Grove Road is a designated City of Concord truck route.

Cowell Road

Existing conditions along Cowell Road between Monument Boulevard/Galindo Street and Treat Boulevard were observed to help understand mobility and physical conditions that exist in this corridor.

There is one travel lane in each direction on Cowell Road and it serves as a connection between the predominantly single-family residential type housing areas in southeastern Concord and downtown. The Cowell Road corridor is heavily traveled during both the AM and PM peak hours but particularly during the PM peak hour. Traffic flow during the PM peak can sometimes be slow due to the number of vehicles trying to get to the Treat Boulevard/Ygnacio Valley Road areas. The intersections with Monument Boulevard/Galindo Street and Mesa Street become particularly busy during the morning and evening peak periods. This occurs because Cowell Road is a very common route for people trying to get to the BART station. This corridor is also served by County Connection Bus Route 213 but only for select trips.

Adjacent land uses on this section of Cowell Road is predominantly single family residential housing. Pedestrian activity is negligible, mainly due to the lack of sidewalks through out most of this section. Parking is generally prohibited along this section of Cowell Road because of its

narrowness, however parking is allowed as the road gets wider towards the Treat Boulevard intersection. Cowell Road is not a City of Concord designated truck route.

Existing Intersection Levels of Service

Table 4.4-6 presents the summary of intersection level of service analysis of existing conditions for the AM and PM peak hours, as well as Saturday peak hour based upon the CCTALOS methodology. The signalized intersections are currently operating at LOS C or better for all study peak periods. The unsignalized intersection of Detroit Avenue and Whitman Road is operating at LOS F during the AM peak and PM peak hour, and LOS B during the Saturday peak hour. LOS calculations for the existing condition are on file and available for review at the City of Concord Transportation Division.

The intersection of Monument Boulevard/Detroit Avenue is operating at LOS A based on the CCTALOS analysis methodology. The field observations showed that the intersection is generally operating between LOS C–D; however, the westbound left-turn movement was observed as operating at LOS E or worse. Currently, vehicles experience significant delays and vehicle queues sometimes extend into the through lane. An operational analysis of the intersection of Monument Boulevard/Detroit Avenue was conducted using the 'TRAFFIX' program. TRAFFIX level of service analysis is based on the 1994 Highway Capacity Manual (HCM) methodology.

TRAFFIX is more accurate for evaluating the operating conditions of signalized intersections than the CCTALOS methodology adopted by the City of Concord because TRAFFIX requires more precise data and offers more parameters in its analysis. The following data was used as input to the TRAFFIX program:

- Turning movement volumes
- Intersection lane geometry and control
- Traffic signal timing

The results of the operational analysis showed that there are 15 vehicles queuing at the westbound left-turn lane. The left-turn storage lane is currently about 150 feet long. This suggests that the existing left-turn storage is inadequate for present traffic volumes.

Operational analysis of the intersection of Monument Boulevard/Oak Grove Road/Meadow Lane indicated that there are no severe queuing and delay problems at the intersection. Operational analysis worksheets are on file and available for review at the City of Concord Transportation Division.

Cumulative Conditions

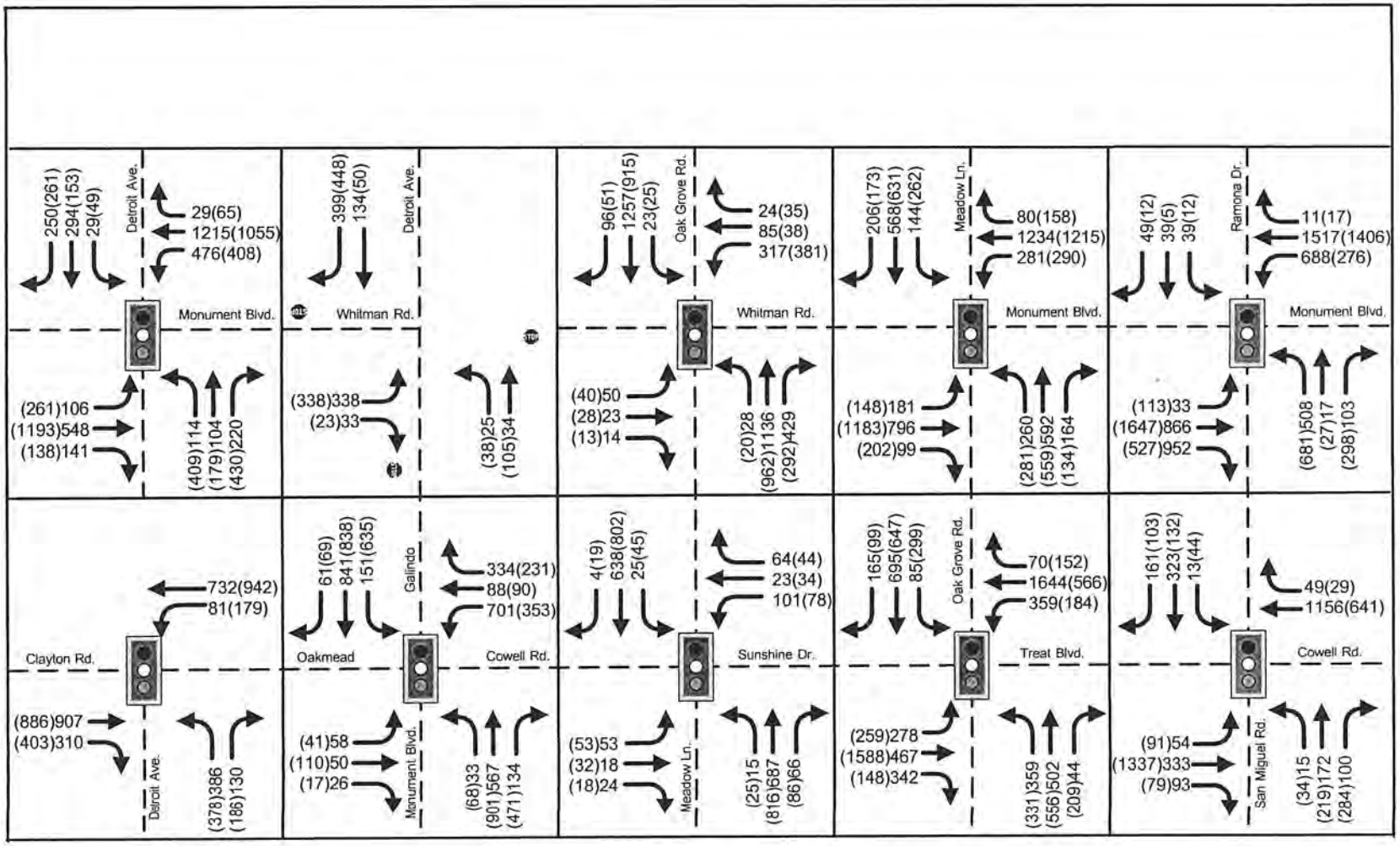
Cumulative Conditions Traffic Volumes

Growth in traffic was derived using an average annual growth rate of 1 percent over a five-year period. Cumulative traffic volumes were derived by applying the total growth rate of 5 percent to the existing turning movement volumes, and then adding project-generated traffic to these volumes. The weekday peak hours and Saturday peak hour cumulative traffic volumes are presented on Figure 4.4-5 and Figure 4.4-6.

Table 4.4-6
Summary of Existing Level of Service Conditions

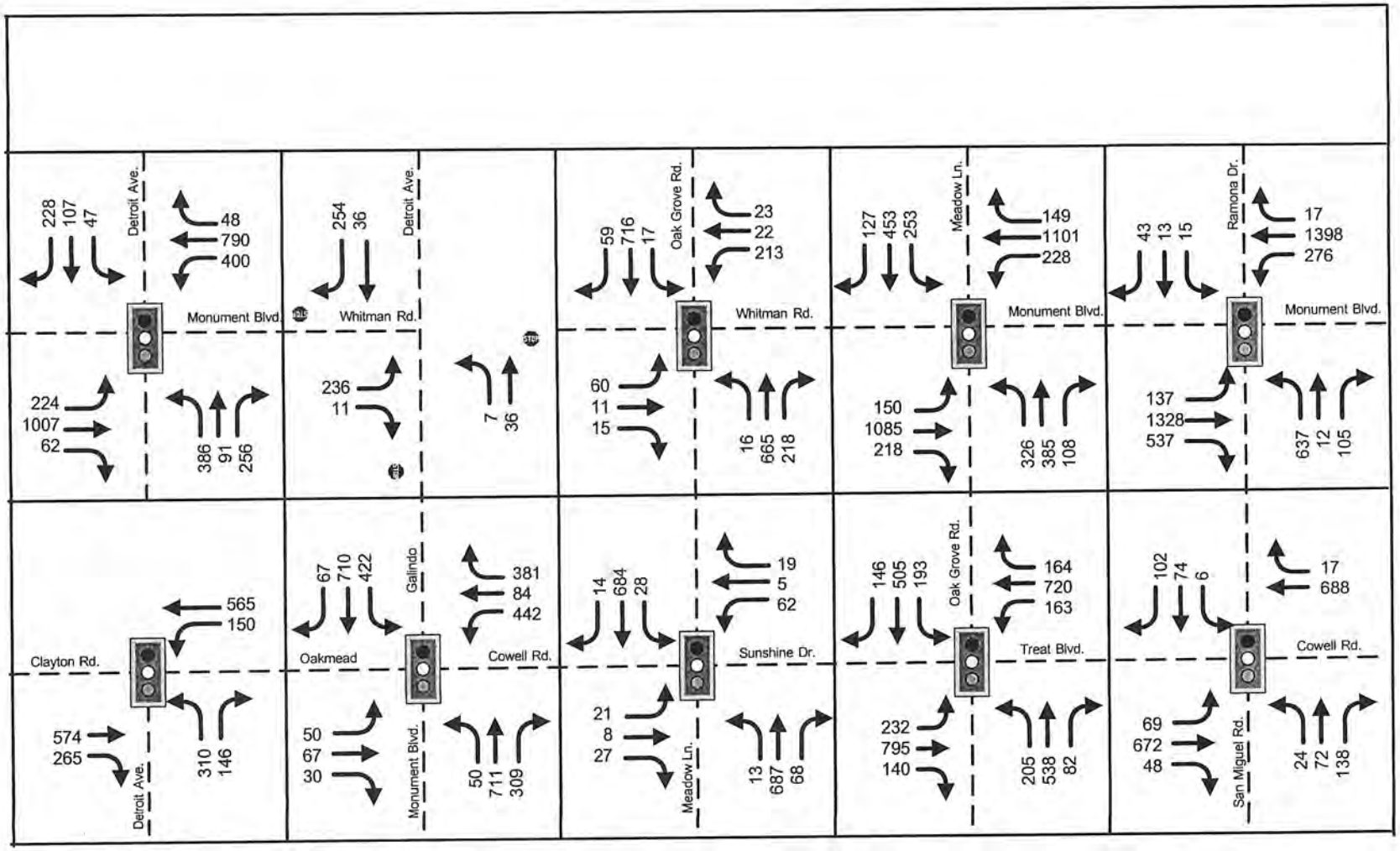
No.	INTERSECTIONS	EXISTING CONDITIONS					
		AM PEAK		PM PEAK		SATURDAY	
		Total V/C Ratio	LOS	Total V/C Ratio	LOS	Total V/C Ratio	LOS
1.	Detroit Avenue & Monument Boulevard	0.56	A	0.53	A	0.39	A
2.	Detroit Avenue & Whitman Road [1]	0	F	0	F	5.9	B
3.	Whitman Road & Oak Grove Road	0.62	B	0.49	A	0.31	A
4.	Monument Boulevard & Oak Grove Road/Meadow Lane	0.57	A	0.57	A	0.47	A
5.	Monument Boulevard & Buskirk Avenue/ Ramona Drive	0.66	B	0.74	C	0.62	B
6.	Detroit Avenue & Clayton Road	0.39	A	0.44	A	0.32	A
7.	Monument Boulevard/Galindo Street & Cowell Road/Oakmead Drive	0.50	A	0.56	A	0.43	A
8.	Meadow Lane & Sunshine Drive	0.61	B	0.69	B	0.53	A
9.	Treat Boulevard & Oak Grove Road	0.80	C	0.70	B	0.49	A
10.	San Miguel Rd & Mesa St./Cowell Rd.	0.57	A	0.71	C	0.35	A

[1] 3-Way Stop Unsignalized intersection with average delay reported instead of V/C ratio.



Source: Rajappan & Meyer

Figure 4.4-5 Cumulative Condition Weekday AM and PM Traffic Volumes



Source: Rajappan & Meyer

Figure 4.4-6 Cumulative Condition Weekend PM Traffic Volumes

Impacts and Mitigation Measures

Significance Criteria

This analysis uses criteria from CEQA Guidelines Appendix G (1998) and standard professional practice to determine the level of significance of the impact. In addition, any exceedance of level of service standards adopted by the City of Concord would be considered a significant impact. The City of Concord General Plan Growth Management Element identifies level of service standards for intersections along different routes under two different designations:

(1) "Routes of Regional Significance" – Regional routes provide connection to two or more regions of the County, provide connection across County boundaries, carry a significant amount of through traffic, or provide access to a regional highway or transit facility (e.g., freeway interchange, BART Station). The LOS standard for a regional route is V/C = 0.85 to 0.89. There are no routes of regional significance in the vicinity of the project site.

(2) "Basic Routes" – Basic routes are all other roads not indicated as routes of regional significance. The City's LOS standards for basic routes are as follows:

Collector Street – LOS C (V/C = 0.75 to 0.79)
Minor Arterial Street – LOS D (V/C = 0.80 to 0.84)
Major Arterial Street – LOS D (V/C = 0.85 to 0.89)

All study intersections come under basic routes LOS standard.

Project Details

The amount of traffic associated with the development area is estimated using a three-step process: (1) trip generation; (2) trip distribution; and (3) trip assignment. In the first step, the amount of traffic entering and exiting the site is estimated on both a daily and peak hour basis. In the second step, the directions are estimated for the trips approaching and departing the site. In the third step, the trips are assigned to specific street segments and intersections.

Project Trip Generation

Estimates of the number of trips generated by the type of development of the project were based on two sources:

(1) The Institute of Transportation Engineers (ITE) *Trip Generation,* 6th Edition:

- Free-Standing Discount Store (815) trip generation rates was used for the Costco Wholesale Warehouse.
- Tire Store (848) trip generation rates was used for the Costco Tire Center
- Fast-Food Restaurant Without Drive-Through Window (833) trip rates was used for the Costco Food Service.
- Specialty Retail Center (814) trip rates was used for the commercial land use parcel.

(2) Survey Data from existing Costco Facilities:

- Survey data trip rates from the existing Costco gas station facility in Santa Clara, California was used for the proposed gas station.
- Survey data from existing Costco store in San Bernardino, California was used for the Costco store during the PM peak hour. These trip rates were more conservative than the ITE trip rates.

The total number of Costco store trips was adjusted by applying a 10 percent reduction for passby trips and a 50 percent reduction of passby trips was applied to the residual parcel. A higher commercial rate was used for commercial in order to conservatively estimate the number of trips associated with that component of the project, and also based on land use survey data presented in the *Institute of Transportation Engineers* (ITE) *Trip Generation Manual*. The Costco gas station trips were also adjusted for internal trips by applying a 70 percent reduction because the survey results of the Santa Clara, California gas station facility indicated that 70 percent of gas station users would also visit the Costco store. Also, a recent study conducted by DKS Associates, of Costco gasoline stations in Sacramento, California indicated an internal capture of 53 to 72 percent during the weekend peak and 56 to 70 percent during the weekday PM peak.

Table 4.4-7 shows all project land uses and corresponding trip generation broken down into three land use components under three study peak periods. Daily project trips are also presented to show average daily traffic generated by the project.

Project Trip Distribution

Trip distribution patterns to the project site were estimated based on the function of the land use and socioeconomic data in the project market area. Costco provided market analysis data and through discussions with the City of Concord Transportation Division, trip distribution patterns were developed for the project. Figures 4.4-7 through 4.4-12 show the trip distribution on the roadway network in the vicinity of the project site for the various components of the proposed project. These projections are based on trip distributions approved by the City of Concord. Appendix D-1 presents global project trip distribution by zip code and population density.

Project Trip Assignment

The trips generated by the proposed development were assigned to the roadway system using the City-approved trip distribution.

The inbound and outbound trip assignments for the AM and PM peak hours were directed to the site based on the locations of driveways and site layout. Figures 4.4-13 and 4.4-14 show the combined Costco project trips at study intersections for the weekday AM peak hour, weekday PM peak hour, and Saturday peak hour. Figure 4.4-15 shows combined project trips at driveway

TABLE 4.4-7

PROJECT TRIP GENERATION ESTIMATES

Land Use (Components)	ITE Code[2]	Size	Unit	Rates: AM Peak	Rates: PM Peak	Rates: SAT Peak	Rates: Daily	Trips: AM Peak In	Trips: AM Peak Out	Trips: AM Peak Total	Trips: PM Peak In	Trips: PM Peak Out	Trips: PM Peak Total	Trips: SAT Peak In	Trips: SAT Peak Out	Trips: SAT Peak Total	Trips: Daily In	Trips: Daily Out	Trips: Daily Total
Costco Store[3]	815	140.746	K.S.F.	-	5.84	7.66	56.63	-	-	-	411	411	822	550	528	1078	3985	3985	7970
Tire Center	848	5.200	K.S.F.	-	4.12	5.94	24.87	-	-	-	9	12	21	14	17	31	65	65	129
Food Service	833	1.075	K.S.F.	-	26.15	54.55	716	-	-	-	14	14	28	29	30	59	385	385	770
Total Costco Store		***147.021***	***K.S.F.***								***434***	***437***	***871***	***592***	***575***	***1168***	***4435***	***4435***	***8869***
Passerby Trips %											10%	10%		10%	10%		10%	10%	
Passerby Trips6											*43*	*44*	*87*	*59*	*58*	*117*	*443*	*443*	*887*
Subtotal											***391***	***393***	***784***	***533***	***518***	***1051***	***3991***	***3991***	***7983***
Costco Gas Station	***N/A[1]***	***12***	***V.F.P.***	***3.46***	***35.33***	***32.25***	***207***	***21***	***21***	***42***	***212***	***212***	***424***	***194***	***194***	***387***	***1239***	***1239***	***2478***
Internal Trips Reduction %											70%	70%		70%	70%		70%	70%	
Internal Trips Reduction[4]											*148*	*148*	*297*	*135*	*135*	*271*	*867*	*867*	*1735*
Subtotal								***21***	***21***	***42***	***64***	***64***	***127***	***58***	***58***	***116***	***372***	***372***	***743***
Residual Parcel[5]																			
Commercial	814	86.3	K.S.F.	6.41	4.93	6.31	40.67	487	66	553	51	374	425	278	267	544	1755	1755	3510
Passerby %								50%	50%		50%	50%		50%	50%		50%	50%	
Passerby Trips6								*243*	*33*	*277*	*26*	*187*	*213*	139	133		877	877	1755
Subtotal		***86.3***	***K.S.F.***					***243***	***33***	***277***	***26***	***187***	***213***	***139***	***133***	***272***	***877***	***877***	***1755***
TOTAL NET NEW PROJECT TRIPS								**264**	**54**	**318**	**480**	**644**	**1124**	**730**	**709**	**1439**	**5240**	**5240**	**10481**

[1] Trip rates based on survey of existing Costco Gas Station Facility in Santa Clara, California.

[2] **Institute of Transportation Engineers,** *Trip Generation*, **6th Edition LAND USE CATEGORIES:**
814 - Speciality Retail Center; 815 - Free-Standing Discount Store; 833 - Fast-Food Restaurant Without Drive-Through Window; 848 - Tire Store.

[3] PM peak Costco Store trip rate based on survey of existing Costco Store in San Bernadino, California.

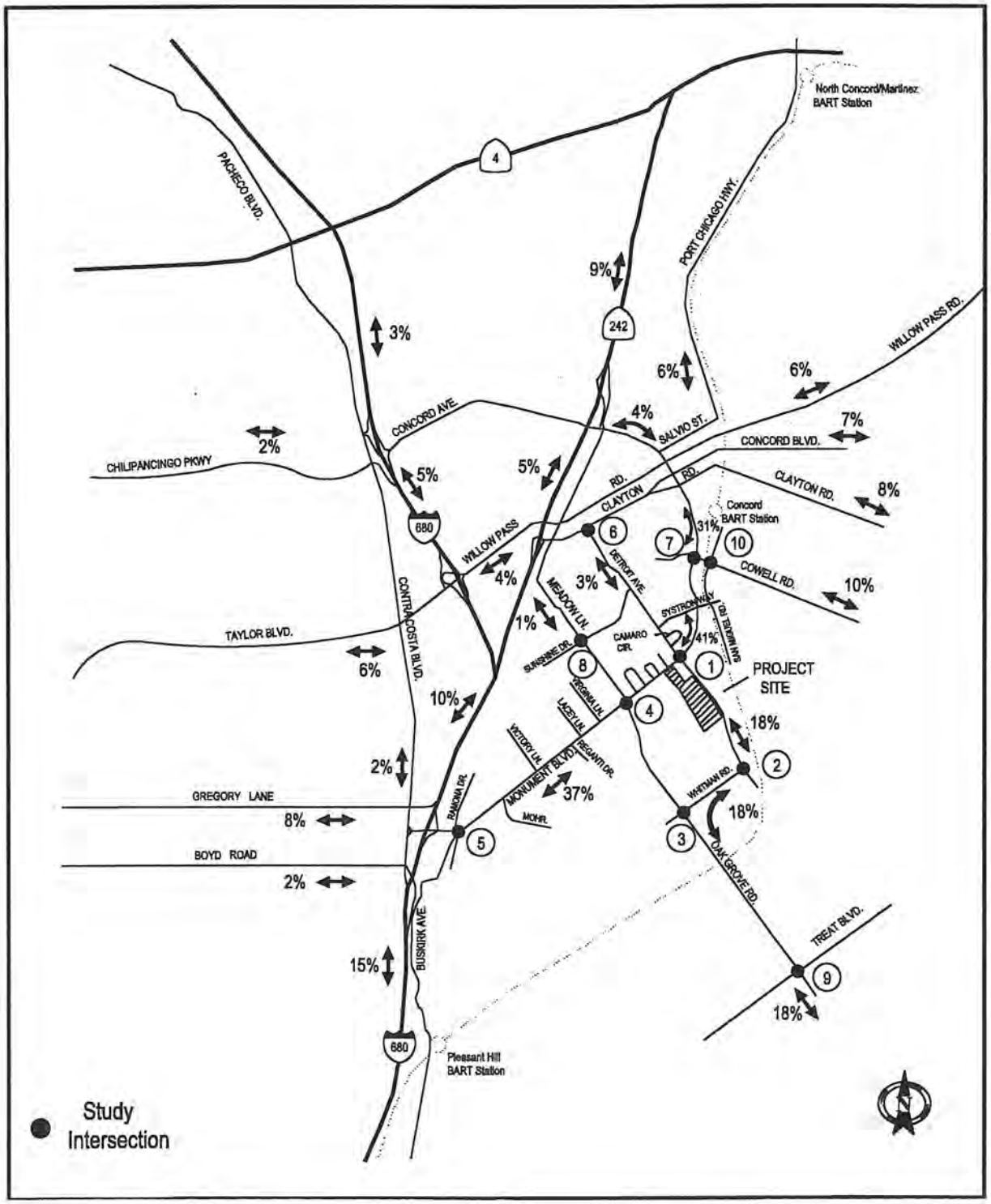
[4] Trip reduction applied to PM peak trip generation because 70% of Gas Station trips will also be visiting the Store as well. (No reduction applied for AM peak since Costco Store opens well after the peak period).

[5] Residual parcel consists of light industrial and retail land uses hence half of k.s.f. is allocated to each land use.

[6] A 10% trip reduction was taken for passerby trips at the Costco Store. A higher rate of 50% reduction for passerby trips was applied to the commercial land use parcel due to the nature of retail trips, and based on land use survey data presented in the **Institute of Transportation Engineers (ITE)** ***Trip Generation Manual.***
Passerby trips are vehicles that would already be travelling on Monument Boulevard, Detroit Avenue, or nearby streets that stop at the project site on their way to their final destination.

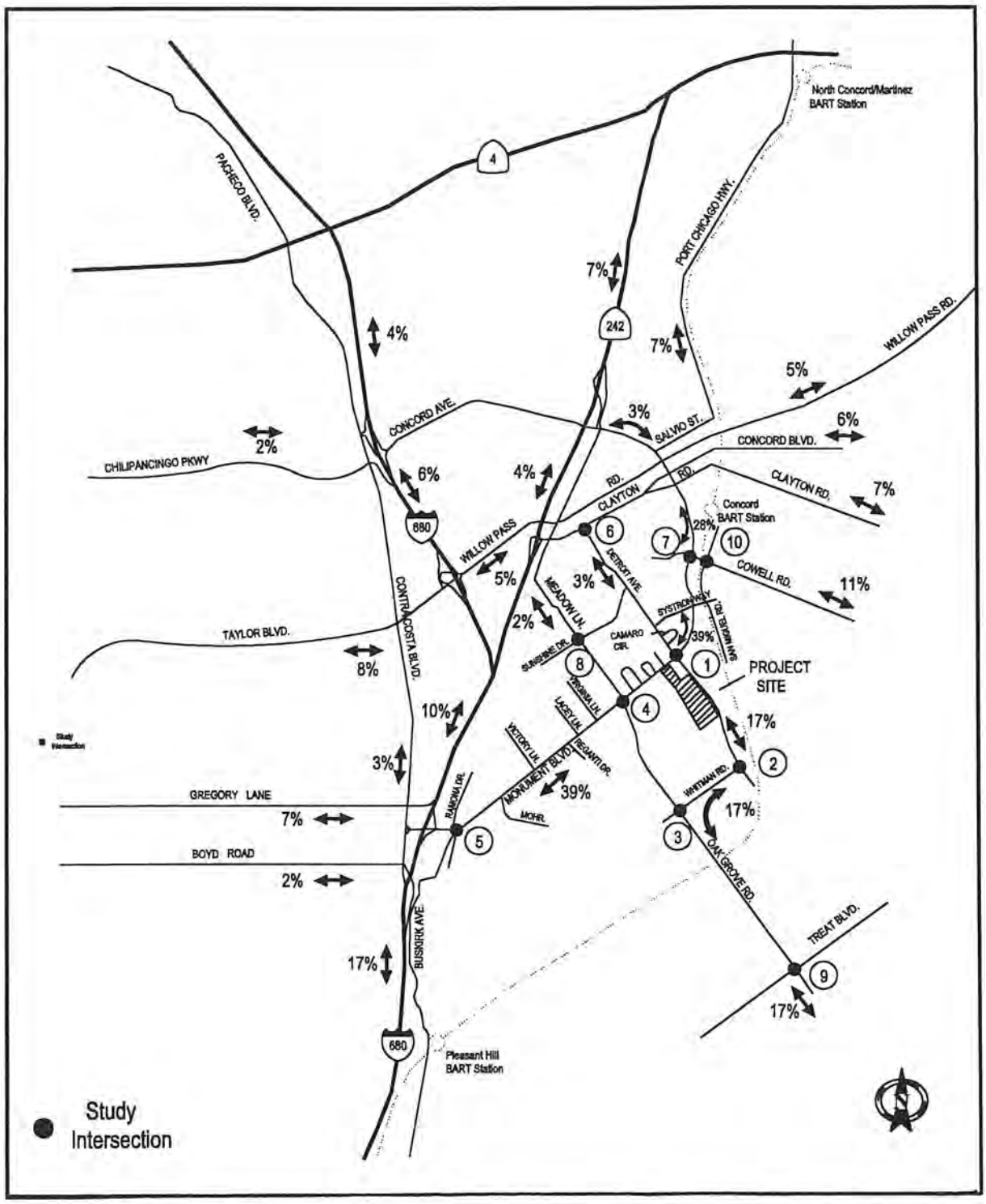
K.S.F. : Per Thousand Square Feet

V.F.P. : Vehicle Fueling Positions



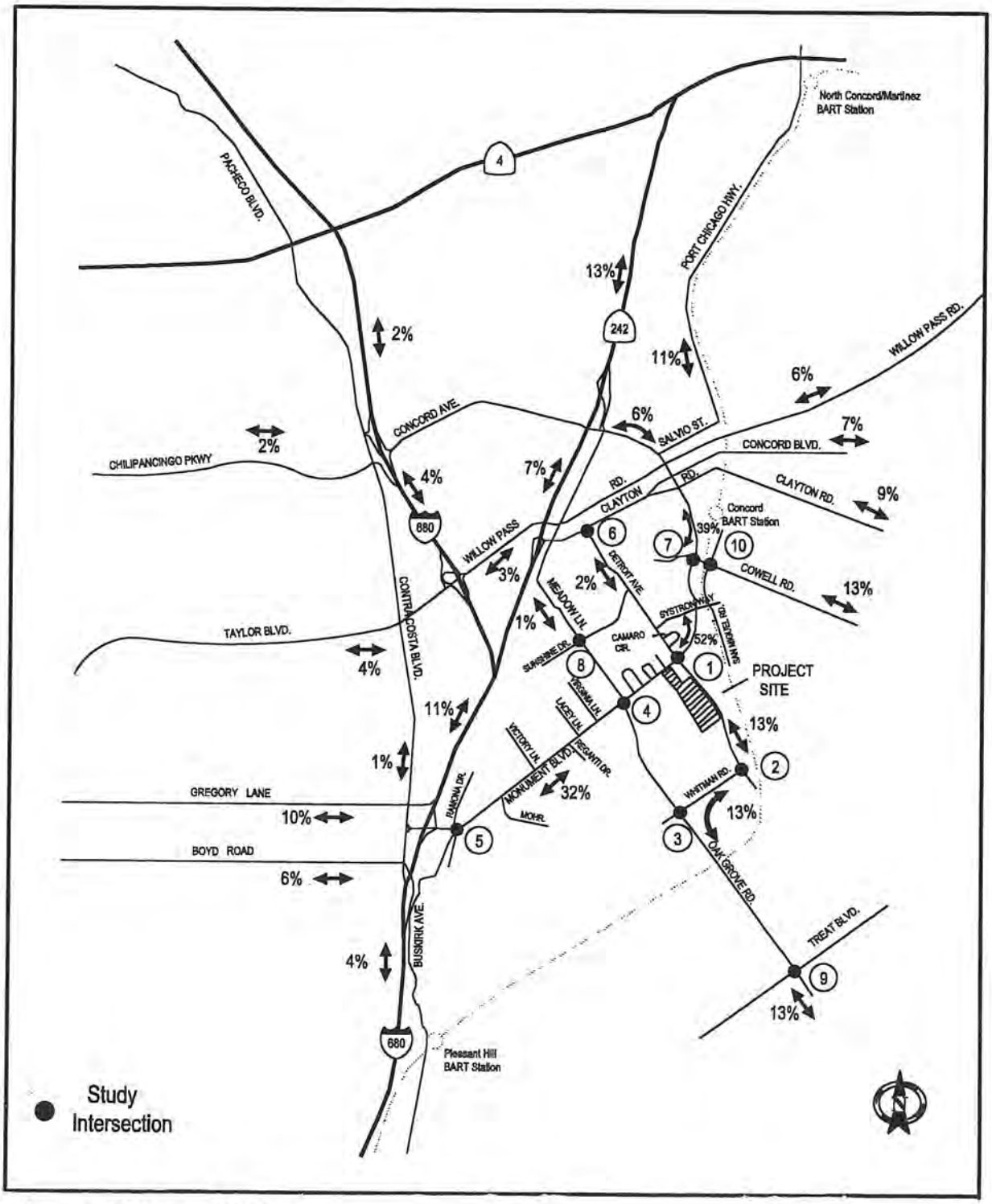
Source: Rajappan & Meyer

Figure 4.4-7 Costco Store Weekday PM Peak Period Trip Distribution



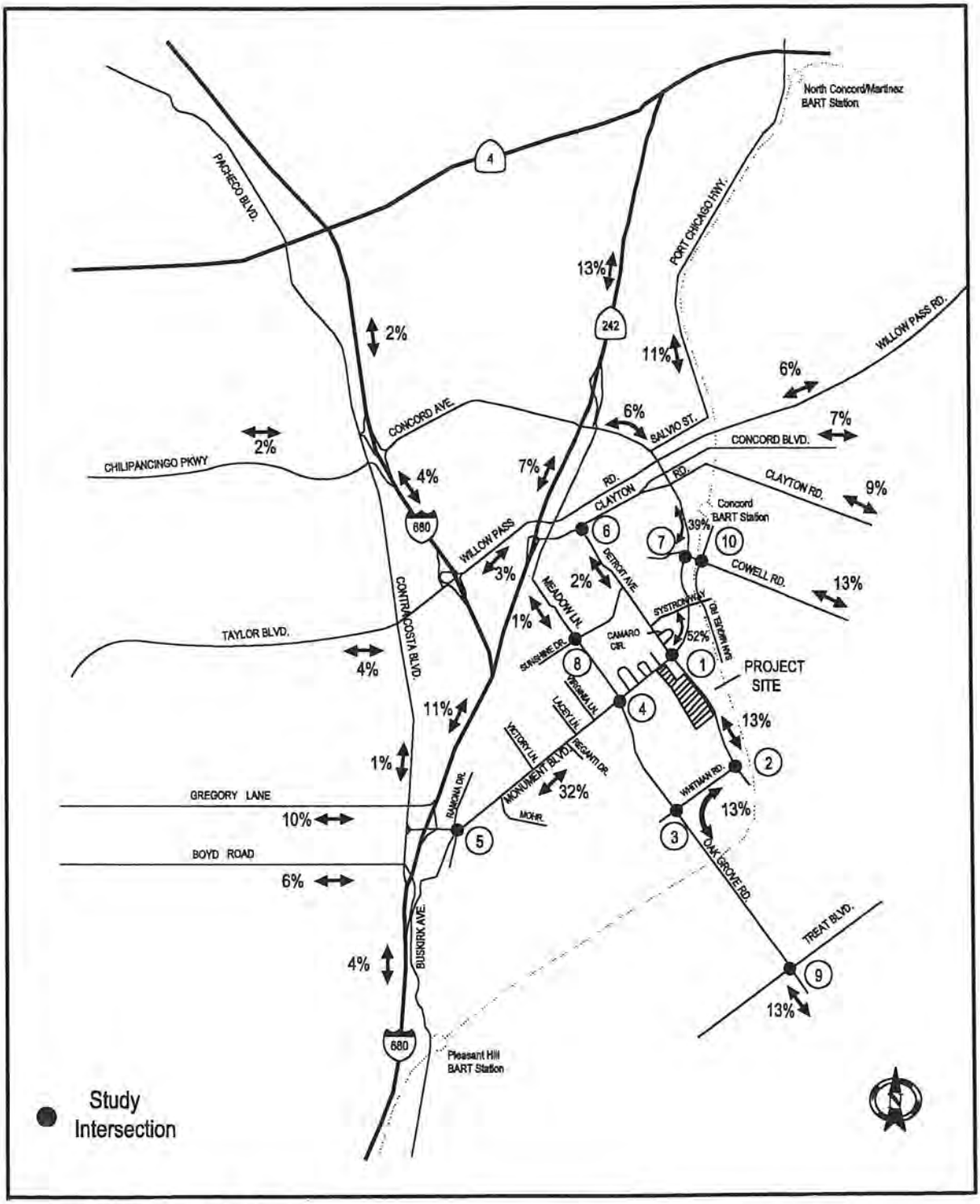
Source: Rajappan & Meyer

Figure 4.4-8 Costco Store Saturday PM Peak Period Trip Distribution



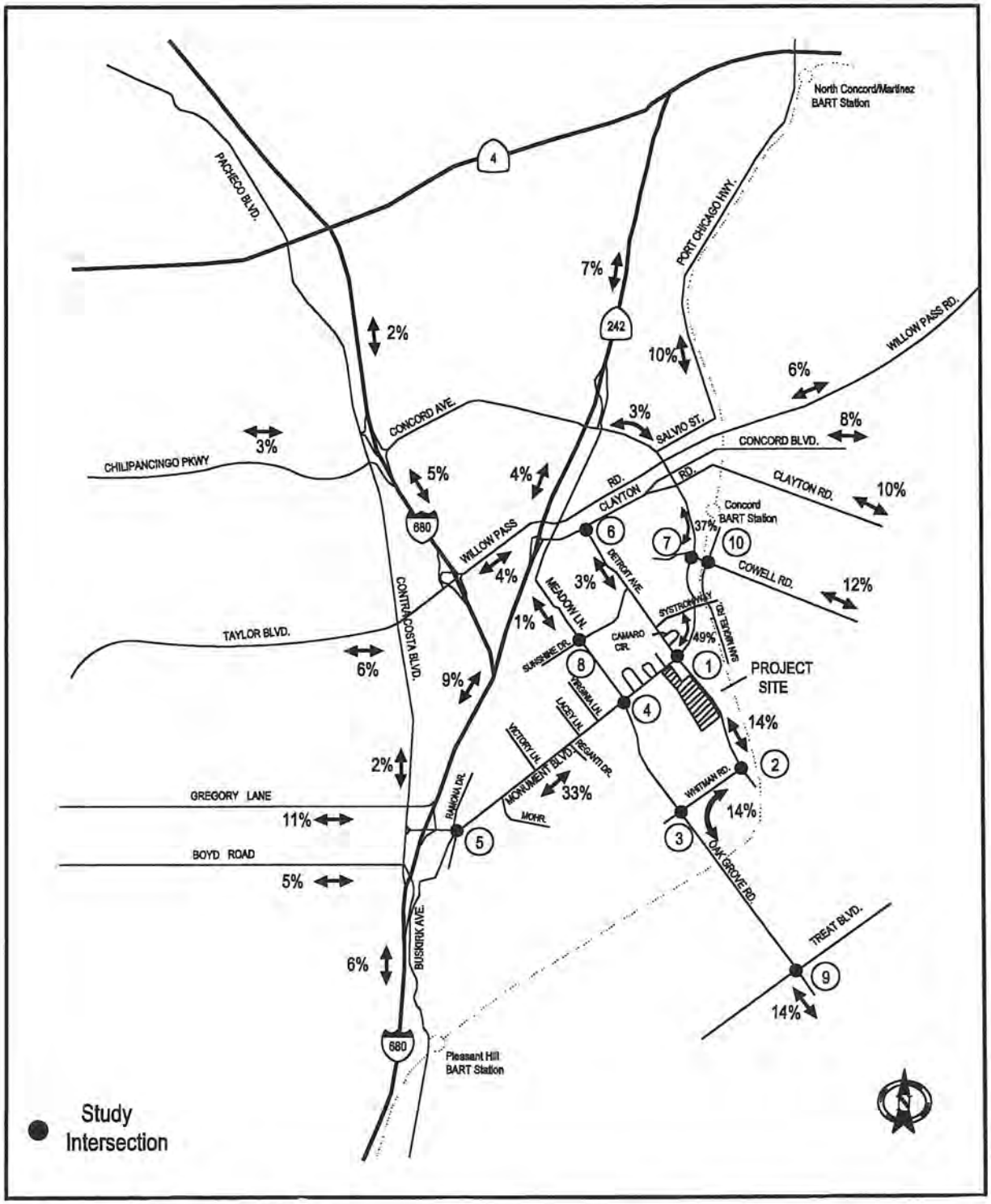
Source: Rajappan & Meyer

Figure 4.4-9 Costco Gas Station Weekday AM Peak Period Trip Distribution



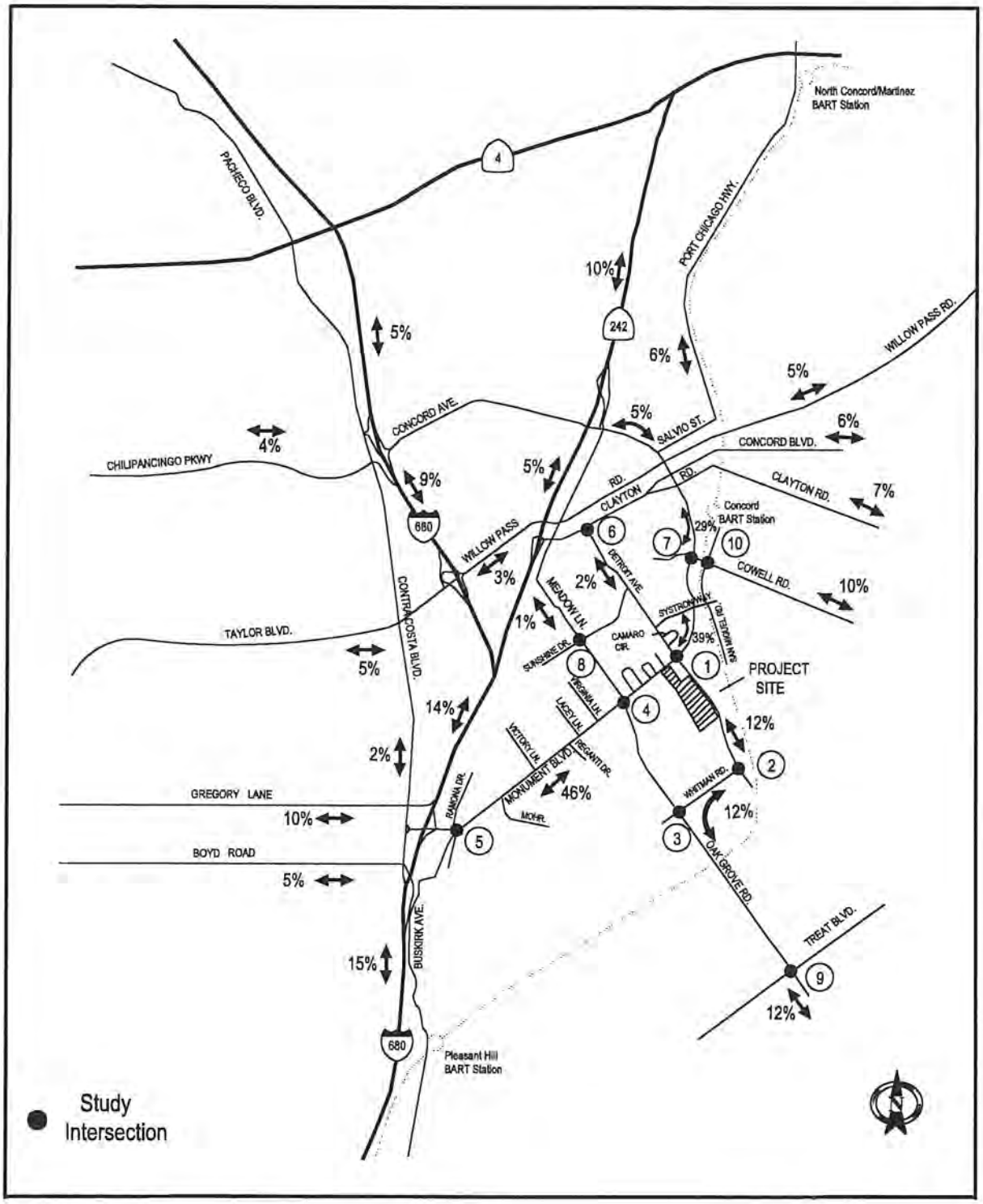
Source: Rajappan & Meyer

Figure 4.4-10 Costco Gas Station Weekday PM Peak Period Trip Distribution



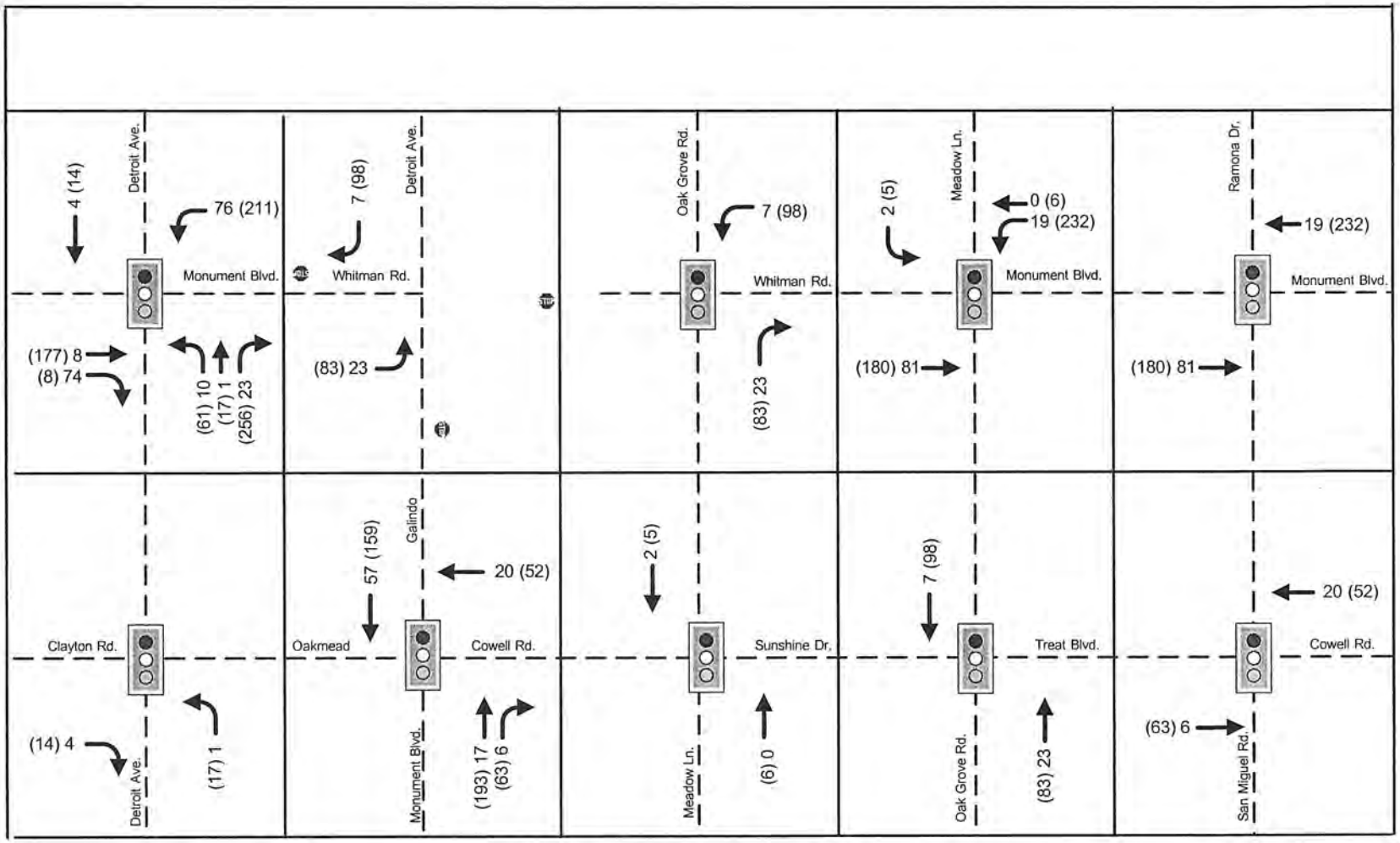
Source: Rajappan & Meyer

Figure 4.4-11 Costco Gas Station Saturday Peak Period Trip Distribution



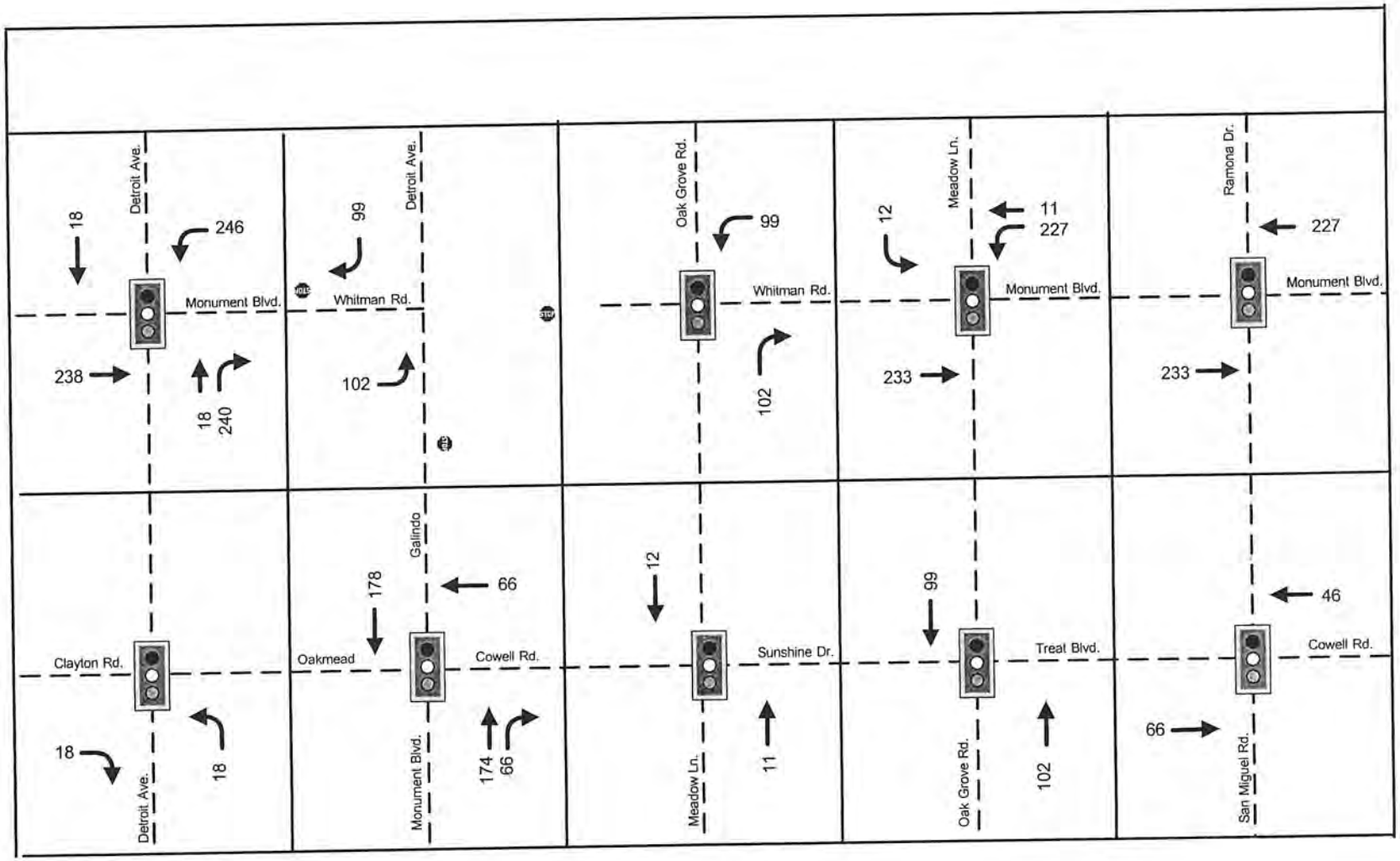
Source: Rajappan & Meyer

Figure 4.4-12 Commercial Use Weekday AM Peak Period Trip Distribution



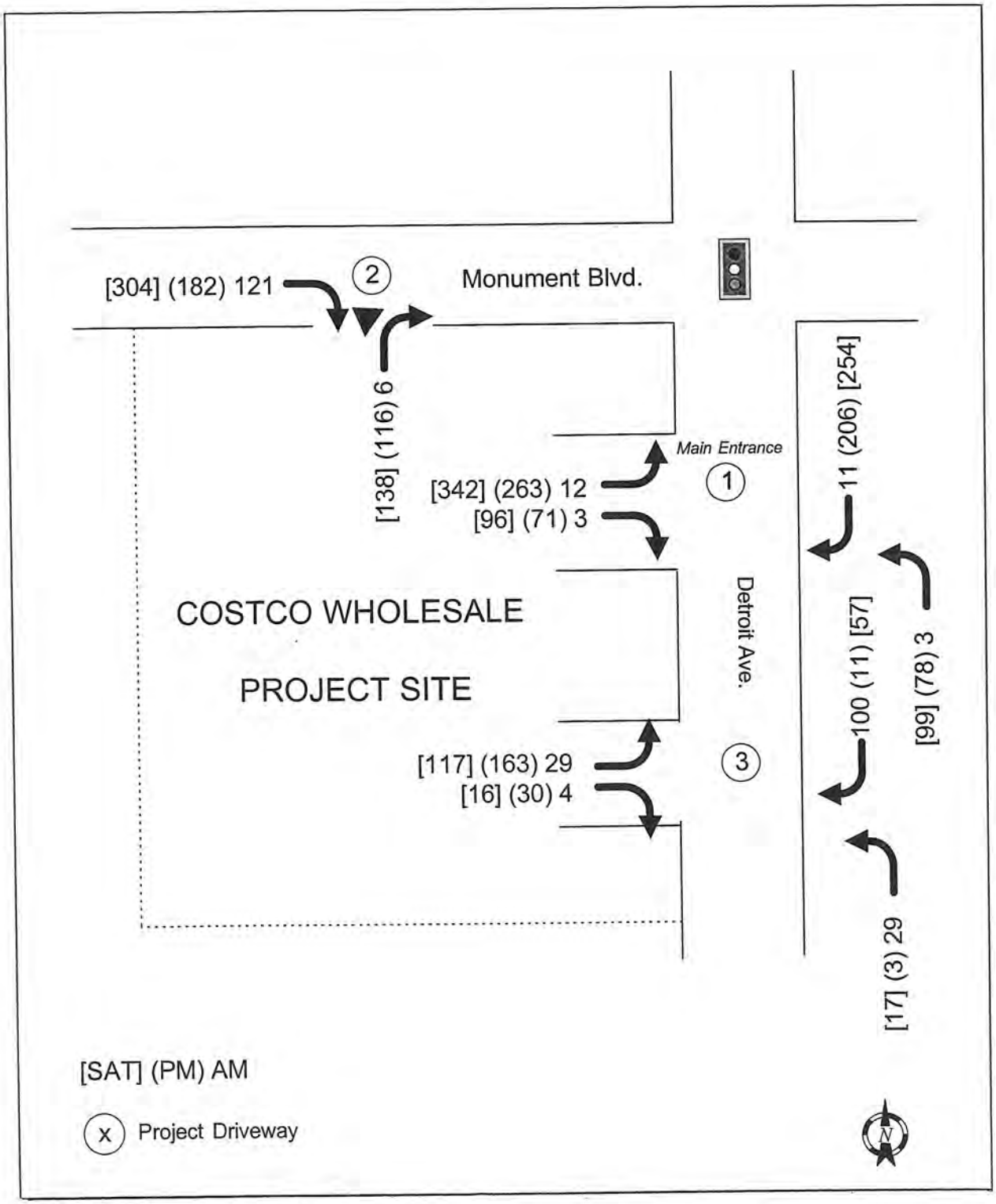
Source: Rajappan & Meyer

Figure 4.4-13 Weekday AM and PM Peak Period Project Trips



Source: Rajappan & Meyer

Figure 4.4-14 Saturday PM Peak Period Project Trips



Source: Rajappan & Meyer

Figure 4.4-15 Combined Costco Project Trips at Driveway Locations

locations for the weekday AM peak hour, weekday PM peak hour, and Saturday peak hour. Project Trip Assignment Spreadsheets are contained in Appendix D-2.

Site Access and Circulation

The Costco Concord project site would have three access points. The main entrance would be located on Detroit Avenue, approximately 500 feet south of Monument Boulevard. This access would permit all vehicular movements to and from the site. The main entrance would provide primary access to the parking lot as well as to the Costco gas station. The second entrance would be on Monument Boulevard, about 350 west of Detroit Avenue and would only allow right-turn in and out of the site and would also provide access to the Costco gas station and the parking lot. The third access point would be located 700 feet south of the main entrance and would allow all vehicular movements into the site. This entrance would primarily serve the proposed commercial development south of the Costco project site as well as the parking lot to the west of the Costco building. It would also serve as primary truck access to the Costco Wholesale facility loading dock. (Refer to the Project Site Plan in Figure 2-2.)

Truck Access and Operations

The main truck access to the Costco Wholesale facility would be the southernmost driveway on Detroit Avenue. Trucks would be prohibited at the main driveway on Detroit Avenue and the secondary driveway access on Monument Boulevard.

Costco anticipates an average of 18 trucks delivering goods on a typical weekday. The trucks range in size from 26 feet long for single-axle trailers to 54 feet long for double axle trailers. Receiving time is from 4:00 a.m to 12:00 p.m., averaging 2 to 3 trucks per hour and most of the deliveries completed before the 10:00 a.m opening time. Deliveries to the warehouse are made primarily in Costco trucks from its freight consolidation facility in Tracy, California. Trucks will be routed from Interstate 680 along Monument Boulevard to Detroit Avenue. They will access the project from the driveway on Detroit Avenue south of the building, which will be sign-posted for truck access, then veer northwesterly towards the building beyond the loading docks, then backing into the loading docks (see Figure 2-2). After the trucks are unloaded, they will turn to the south at the building corner, then turn east into the drive aisle back to Detroit Avenue, turn left and proceed to Monument Avenue, turning left to return to I-680 and Tracy.

Fuel truck deliveries are anticipated to occur daily during hours of operation, usually between 6:00 a.m. an 10:00 a.m. The fuel trucks will come from I-680, via Monument Boulevard to the Monument Boulevard entrance to the project, and proceed over the drive aisle along the westerly property line. The largest fuel trucks are approximately 70 feet long and carry 9,250 gallons. While delivering the fuel, the truck will be parked over the underground tanks located on the west side of the gas station (Figure 2-2). The truck usually will not block access to any of the twelve fueling stations, but its presence may discourage customers from accessing the westerly most bay; for this reason, deliveries are scheduled at non-peak periods. After delivering the fuel, the truck will proceed through the gas station, head west towards the loading docks, then turn right and exit via the same course to I-680 as is used by the Costco warehouse delivery trucks.

The tire center typically will receive shipments of tires two times per week in single or double-trailer trucks of up to 60 feet in length and pick up of old tires usually will occur once per week in 28 foot long trucks. Their typical routing will be from I-680 via Monument Boulevard to Detroit Avenue to the main entrance the to the tire center; they will depart by returning to the main entrance, turning left onto Detroit Avenue, left onto Monument Boulevard and proceeding to I-680. Deliveries to and pickups from the tire center will be scheduled for pre-opening hours, typically about 6:00 a.m. In an average week, a total of approximately 100 trucks will call upon the Costco warehouse, tire center and gas station.

The turning radii at truck entrances and exits were checked and the geometry shows that there would be adequate truck turning and maneuvering space at the loading sections. The loading bay provided at the south side of the building would allow for easy truck delivery.

Project Impacts

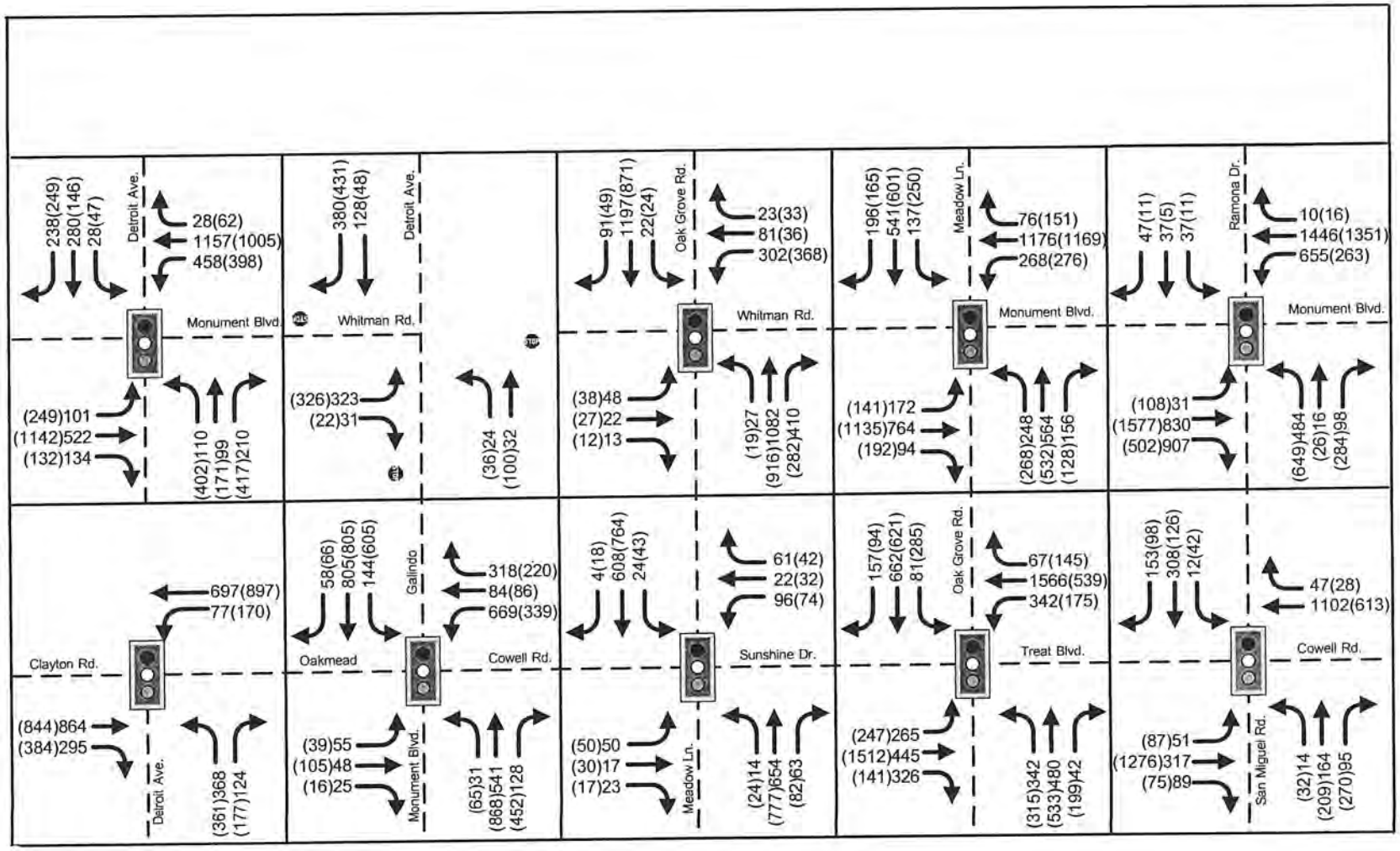
Existing Plus Project Traffic

IMPACT 4.4-1: Project-generated traffic would cause the level of service at the intersection of Detroit Avenue and Whitman Road to deteriorate to LOS F during the Saturday peak period. This is a *potentially significant* impact.

The project-generated trips were added to the existing traffic volumes, and a level of service analysis was performed on the combined volumes using the CCTALOS and HCS software. The project would add up to 39 trips during the AM peak, 182 trips during the PM peak, and 228 trips during the Saturday peak period to this intersection. The sum of existing volumes plus project generated trips for the weekday AM peak hour, weekday PM peak hour, and Saturday peak hour are shown in Figures 4.4-16 and 4.4-17.

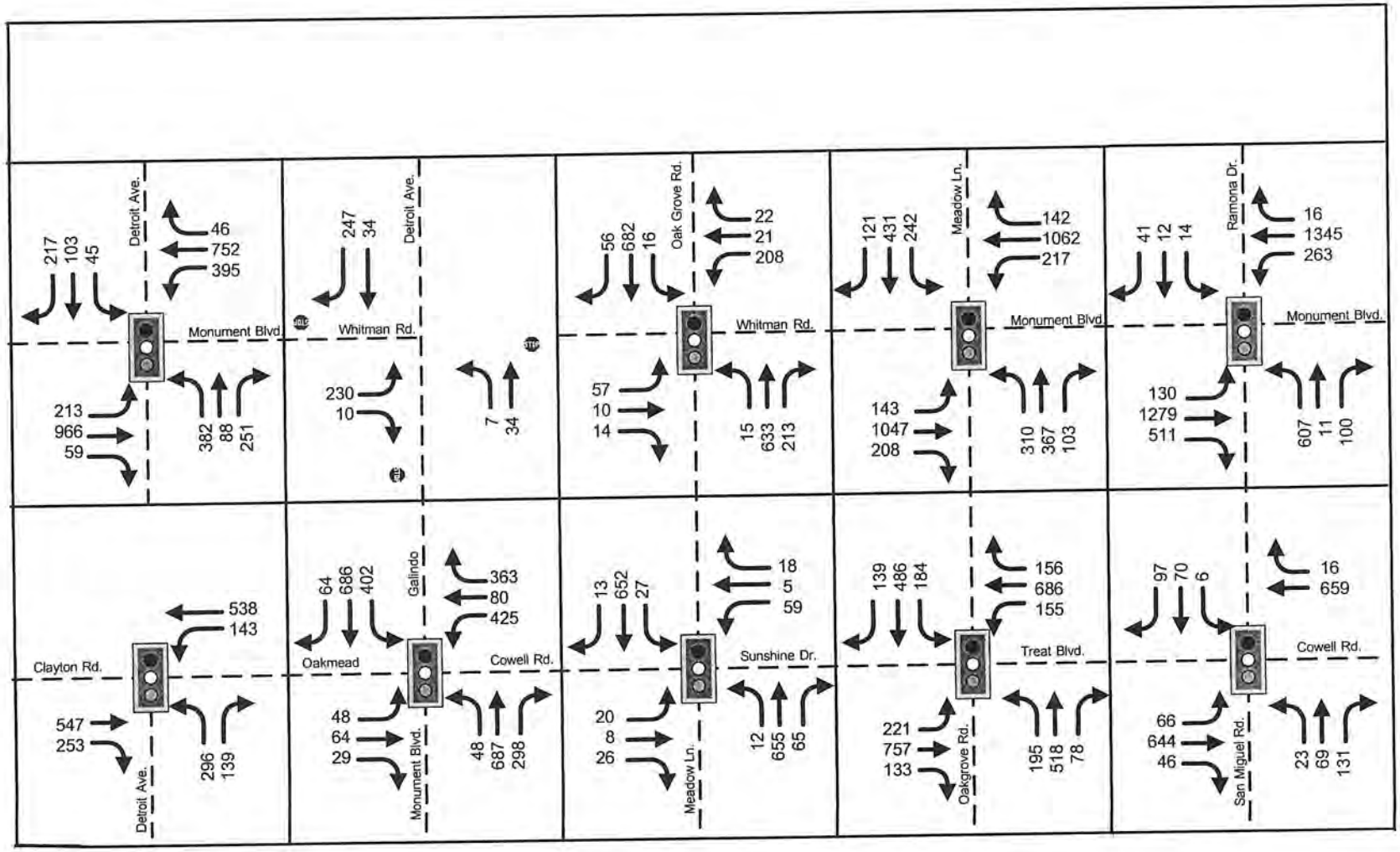
The existing-plus-project traffic volumes were used to calculate the levels of service that would result with implementation of the proposed project. The analysis was performed for the ten intersections identified by the City of Concord for weekday AM and PM peak hours and for Saturday PM peak hours. The results of the intersection level of service calculations are summarized in Table 4.4-8. The analysis showed that under project conditions the Detroit Avenue/Whitman Road intersection would continue to operate at LOS F during the weekday AM and PM peak hours and would deteriorate from LOS B to LOS F during the Saturday PM peak period.

The intersection of Detroit Avenue and Whitman Road would require traffic signal installation to improve the level of service conditions, and to ensure that safe traffic and pedestrian conditions are maintained. This is the only possible mitigation due to limited sight distance problems at the intersections.



Source: Rajappan & Meyer

Figure 4.4-16 Existing Plus Project Weekday Traffic Volumes



Source: Rajappan & Meyer

Figure 4.4-17 Existing Plus Project Weekend Traffic Volumes

Table 4.4-8
Existing Plus Project Levels of Service

No.	Intersections	Existing Conditions						Project Conditions					
		AM Peak		PM Peak		Saturday		AM Peak		PM Peak		Saturday	
		Total V/C Ratio	LOS	Total V/C Ratio	LOS	Total V/C Ratio	LOS	Total V/C Ratio	LOS	Total V/C Ratio	LOS	Total V/C Ratio	LOS
1.	Detroit Avenue & Monument Boulevard	0.56	A	0.53	A	0.39	A	0.65	B	0.83	D	0.74	C
2.	Detroit Avenue & Whitman Road[1]	0	F	0	F	5.9	B	0	F	0	F	0	F
3.	Whitman Road & Oak Grove Road	0.62	B	0.49	A	0.31	A	0.64	B	0.55	A	0.38	A
4.	Monument Boulevard & Oak Grove Road/ Meadow Lane	0.57	A	0.57	A	0.47	A	0.57	A	0.60	A	0.52	A
5.	Monument Boulevard & Buskirk Avenue/ Ramona Drive	0.66	B	0.74	C	0.62	B	0.68	B	0.79	C	0.71	C
6.	Detroit Avenue & Clayton Road	0.39	A	0.44	A	0.32	A	0.39	A	0.45	A	0.33	A
7.	Monument Boulevard/ Galindo Street & Cowell Road/Oakmead Drive	0.50	A	0.56	A	0.43	A	0.53	A	0.64	B	0.52	A
8.	Meadow Lane & Sunshine Drive	0.61	B	0.69	B	0.53	A	0.61	B	0.70	B	0.54	A
9.	Treat Boulevard & Oak Grove Road	0.80	C	0.70	B	0.49	A	0.81	D	0.73	C	0.52	A
10.	San Miguel Road & Mesa Street/Cowell Rd	0.57	A	0.71	C	0.35	A	0.58	A	0.73	C	0.37	A

[1] 3-Way Stop Unsignalized intersection with average delay reported instead of V/C ratio.
* denotes intersection delay in excess of 60 seconds.

All other study intersections would continue to operate at LOS D or better. The LOS calculations for the project condition are on file and available for review at the City of Concord Transportation Division.

❑ **MITIGATION MEASURE 4.4-1:** The project sponsor shall install signals at the Detroit Avenue/Whitman Road intersection since the signal would not be needed without the project.

MONITORING	
Mitigation Implementation:	*Project Sponsor*
Monitoring Requirement:	*Review and approve the design and installation of traffic signal in accordance with City standards*
Responsibility for Monitoring:	*City Transportation Division*
Timing:	*Prior to issuance of occupancy permit for the store and gas station*

Queuing at Critical Intersections

IMPACT 4.4-2: Project-generated traffic would result in left-turn queuing at the westbound approach to the intersection of Monument Boulevard and Detroit Avenue that would exceed left-turn lane capacity. This is a *potentially significant* impact.

The results of the project condition level of service analysis using the CCTALOS methodology shows the intersection of Monument Boulevard/Detroit Avenue still operating at LOS B or better during all peak periods following implementation of the project. However, operational analysis of the intersection under project conditions suggests that queuing at the westbound left-turn lane would increase to 19 vehicles during the AM peak hour, 20 vehicles during the PM peak hour, and 19 vehicles during the Saturday peak hour. The proposed project would add up to 106 trips in the AM peak, 203 trips in the PM peak, and 290 trips in the Saturday peak to the westbound left-turn movement intersection during the Saturday peak period which is the worst case scenario.

The Costco project would contribute significantly to westbound left-turn traffic, which would result in additional delays and queuing at this intersection. Fair share contribution by Costco will be determined as a condition of approval.

Operational analysis worksheets are on file and available for review at the City of Concord Transportation Division.

❑ **MITIGATION MEASURE 4.4-2:** The project sponsor shall extend the existing left-turn lane at the westbound approach to the intersection of Monument Boulevard and Detroit Avenue to 250 feet, provide an additional left-turn lane of the same length, and adjust the signal timing to eight-phase to provide protected left-turn phases.

Secondary Impact with Mitigation Implementation: Will eliminate one westbound through-lane on Detroit Avenue, which will result in lane offsets, relocation of existing equipment, e.g., poles, undergrounding of existing overhead utilities; new median reconstruction on Monument Boulevard and frontage improvements.

MONITORING

Mitigation Implementation:	*Project Sponsor*
Monitoring Requirement:	*Review and approve the design for extension of left-turn lane, adding an additional left-turn lane and adjusting the signal timing in accordance with City standards. Inspect construction of traffic lane and inspect signal improvements.*
Responsibility for Monitoring:	*City Transportation Division*
Timing:	*Prior to issuance of occupancy permit for the store and gas station*

Queuing at Project Driveways

IMPACT 4.4-3: On-site queuing at the main site entrance during worst-case conditions (PM peak) would result in unacceptable delays and congestion in internal circulation. This is a *potentially significant* impact.

Under the worst case scenario, the analysis showed that there would be no queuing at the driveway locations except at the main entrance. Under project conditions without a traffic signal, the main entrance (eastbound left-turn) would experience severe delays in excess of 4 minutes and queues in excess of 100 vehicles, which would block access on site and restrict circulation. This could also interfere with emergency vehicle access when attempting to enter or leave the site. The results of the queuing analysis are summarized in Table 4.4-9. Queuing analysis worksheets are on file and available for review at the City of Concord Transportation Division. The installation of a traffic signal at the main driveway would result in loss of 20 to 30 existing parking spaces near the proposed driveway and on the opposite side of the street.

❑ **MITIGATION MEASURE 4.4-3A:** The project sponsor shall install a traffic signal at the main entrance to the project site.

Table 4.4-9
Summary of Driveway Queuing Analysis

Intersection	Direction	Movement	No. of Lanes	Storage Length (feet)	Comments
1. Detroit Avenue & Driveway (main entrance)	NB SB EB	Left Through Through Right Left Right	1 1 1 < Sh 1 1	N/A N/A N/A N/A N/A N/A	Extensive queuing occurring at the eastbound approach into the project site. This causes this driveway to operate at unacceptable LOS F during the PM peak hour and Saturday peak hour. The driveway intersection meets Caltrans Traffic Signal Warrant #11 (Peak Hour Volume). Requires traffic signal for the intersection to operate at an acceptable level of service.
2. Monument Blvd. & Driveway 2	NB EB	Right Through Right	1 3 < Sh	75' N/A 100'	Analysis shows that storage is not required for some of the left- and right-turn movements. The storage length presented is recommended based on traffic engineering judgement and traffic volumes.
3. Detroit Avenue & Driveway 3	NB SB EB	Left Through Through Right Left Right	1 1 1 < Sh 1 < Sh	75' N/A N/A N/A N/A N/A	Analysis shows that storage is not required for some of the left- and right-turn movements. The storage length presented is recommended based on traffic engineering judgement and traffic volumes.

< Sh – Shared lane

Queuing Analysis was carried out using the Highway Capacity Software which is based on the 1994 *Highway Capacity Manual* (HCM) methodology for unsignalized intersections. The above lane configurations will be provided as part of the project.

MONITORING

Mitigation Implementation:	*Project Sponsor*
Monitoring Requirement:	*Review and approve the design and installation of traffic signal in accordance with City standards*
Responsibility for Monitoring:	*City Transportation Division*
Timing:	*Prior to issuance of occupancy permit for the store and gas station*

❑ **MITIGATION MEASURE 4.4-3B:** The project sponsor shall be required to provide parking on site to the impacted businesses equal to the number of parallel parking stalls eliminated on Detroit Avenue.

MONITORING

Mitigation Implementation:	*Project Sponsor*
Monitoring Requirement:	*Confirm installation of signage restricting the appropriate number of parking spaces for use by businesses on Detroit Avenue*
Responsibility for Monitoring:	*City Transportation Division*
Timing:	*Prior to issuance of occupancy permit for the store and gas station*

On-site Circulation

With the exception of the on-site queuing problems discussed above, the circulation pattern appears adequate to accommodate customer traffic and delivery trucks. Adequate truck turning and maneuvering space has been provided. Implementation of a traffic signal at the main entrance will offset potential on-site circulation problems. On-site pedestrian circulation is adequate and accessible pedestrian connections between all buildings on the site has been provided and is shown on the site plan. Queuing at the proposed gas service station is expected to be minimal and the fuel trucks usually will not block access to any of the twelve fueling positions. Although fuel truck deliveries are anticipated to occur daily during the hours of operation(6:00 a.m. and 10:00 p.m.), the deliveries would be scheduled for non peak periods to reduce the possibility of fuel truck conflicts with other vehicles on site.

Parking

Approximately 1,013 on-site parking spaces, all full size, are planned for the project. The City of Concord parking ordinance requirement for this type of development is approximately 878 parking spaces, based on a ratio of 4.5 spaces per 1,000 square feet for the Costco store and 2.5 spaces per 1,000 square feet for the residual parking. Therefore, the proposed project would have more than enough parking for employees, customers and other visitors to Costco and the commercial uses on the residual commercial parcel.

Corridor Movement

The estimated trips generated by the project that will use the corridors in the area—Monument Boulevard, Detroit Avenue, Oak Grove/Meadow Lane, and Cowell Road—will not significantly increase the volumes on these corridors. The significant impacts are localized near the project site. These isolated impacts have been addressed in the previous section.

Cumulative Impacts

Cumulative Levels of Service

IMPACT 4.4-4: Level of service at the intersection of Detroit Avenue and Whitman Road will deteriorate to LOS F during the Saturday peak period. This is a *potentially significant* impact.

Intersection levels of service under cumulative conditions were compared to existing and project condition levels of service. Under cumulative conditions, traffic levels of service would deteriorate slightly from project conditions, but would remain at acceptable LOS with the exception of the Detroit Avenue/Whitman Road intersection. The results of the cumulative level of service analysis are presented in Table 4.4-10. The LOS calculations for the cumulative conditions are on file and available for review at the City of Concord Transportation Division.

❑ **MITIGATION MEASURE 4.4-4:** The project sponsor shall install signals at the Detroit Avenue/Whitman Road intersection since the signal would not be needed without the project.

MONITORING

Mitigation Implementation:	*Project Sponsor*
Monitoring Requirement:	*Review and approve the design and installation of the traffic signal in accordance with City standards*
Responsibility for Monitoring:	*City Transportation Division*
Timing:	*Prior to issuance of occupancy permit for the store and gas station*

Cumulative Condition Intersection Impact

IMPACT 4.4-5: Cumulative future traffic, including project-generated traffic, would result in left-turn queuing at the westbound approach to the intersection of Monument Boulevard and Detroit Avenue that would exceed left-turn lane capacity and degrade level of service below acceptable levels. This is a *potentially significant* impact.

Table 4.4-10
Intersection Level of Service Summary

Intersection	Peak Hour	Existing Condition		Project Condition		Cumulative Condition		Cumulative Condition (Mitigated)	
		LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C
1. Monument Blvd. & Detroit Avenue	AM	A	0.56	B	0.65	B	0.68	A	0.56
	PM	A	0.53	D	0.83	D	0.86	C	0.75
	SAT	A	0.39	C	0.74	C	0.76	B	0.65
2. Detroit Avenue & Whitman Road[1]	AM	F	*	F	*	F	*	A[2]	0.5
	PM	F	*	F	*	F	*	A[2]	.49
	SAT	B	5.9	F	*	F	*	A[2]	0.3
3. Whitman Road & Oak Grove Road	AM	B	0.62	B	0.64	B	0.67		
	PM	A	0.49	A	0.55	A	0.58	N/A	N/A
	SAT	A	0.31	A	0.38	A	0.40		
4. Monument Blvd. & Oak Grove Road Meadow Lane	AM	A	0.57	A	0.57	A	0.60		
	PM	A	0.57	A	0.60	B	0.63	N/A	N/A
	SAT	A	0.47	A	0.52	A	0.55		
5. Monument Blvd. & Buskirk Avenue Ramona Drive	AM	B	0.66	B	0.68	C	0.71		
	PM	C	0.74	C	0.79	D	0.83	N/A	N/A
	SAT	A	0.62	C	0.71	C	0.74		
6. Detroit Avenue & Clayton Road	AM	A	0.39	A	0.39	A	0.41		
	PM	A	0.44	A	0.45	A	0.47	N/A	N/A
	SAT	A	0.32	A	0.33	A	0.35		
7. Monument Blvd. & Galindo Street Cowell Road & Oakmead Drive	AM	A	0.5	A	0.53	A	0.56		
	PM	A	0.56	B	0.64	B	0.67	N/A	N/A
	SAT	A	0.43	A	0.52	A	0.54		
8. Meadow Lane & Sunshine Drive	AM	B	0.61	B	0.61	B	0.64		
	PM	B	0.69	B	0.70	C	0.73	N/A	N/A
	SAT	A	0.53	A	0.54	A	0.56		
9. Treat Boulevard & Oak Grove Road	AM	C	0.8	D	0.81	D	0.85		
	PM	B	0.7	C	0.73	C	0.77	N/A	N/A
	SAT	A	0.49	A	0.52	A	0.55		
10. San Miguel Road & Mesa Street & Cowell Road	AM	A	0.57	A	0.58	B	0.61		
	PM	C	0.71	C	0.73	C	0.76	N/A	N/A
	SAT	A	0.35	A	0.37	A	0.39		

[1] 3-Way Stop Unsignalized intersection, (Average delay reported)
* denotes intersection delay in excess of 60 seconds.
[2] Unsignalized intersection becomes signalized under mitigated conditions.

Operational analysis at the intersection of Monument Boulevard and Detroit Avenue indicates that there would be 20 vehicles queuing at the westbound left-turn lane during the PM peak hour. This would cause levels of service to deteriorate to LOS F. This situation would be caused by the effects of additional trips resulting from cumulative growth (including the Costco project) on the intersection. Operational analysis worksheets are on file and available for review at the City of Concord Transportation Division. Mitigation would be necessary at the Monument Boulevard/Detroit Avenue location to allow the westbound left-turn lane to operate at an acceptable LOS and to improve the queuing and delay problem.

- **MITIGATION MEASURE 4.4-5:** The project sponsor shall extend the existing left-turn lane at the westbound approach to the intersection of Monument Boulevard and Detroit Avenue to 250 feet, provide an additional left-turn lane of the same length, and adjust the signal timing to eight-phase.

MONITORING

Mitigation Implementation:	*Project Sponsor*
Monitoring Requirement:	*Review and approve the design for extension of left-turn lane, adding an additional left-turn lane and adjusting the signal timing in accordance with City standards. Inspect construction of traffic lane and inspect signal improvements.*
Responsibility for Monitoring:	*City Transportation Division*
Timing:	*Prior to issuance of occupancy permit for the store and gas station*

4.5 BIOLOGICAL RESOURCES

Setting

The nearly level site is surrounded by development including commercial businesses, light industry and residences. An excavated road-side ditch approximately three feet wide and three feet deep is present just outside the study area adjacent to a portion of Detroit Avenue. Pine Creek. is contained in a 35-foot-wide concrete-lined channel, maintained by the Contra Costa County Flood Control and Water Conservation District and borders the westerly property line.

The majority of the property is undeveloped and has been used for the stockpiling of soil and rubble. The date that fill was placed on the property is unknown, but the piles have become compacted and consolidated with age, and most of the site is currently covered with low dense vegetation. Graded, paved and graveled parking areas are also present on site, which are currently being used for vehicle and equipment storage. The developed portion of the site is surrounded by chain link fencing.

The entire property has been altered considerably from its natural condition and supports highly disturbed ruderal vegetation. A few planted and naturally occurring trees and shrubs are also present. No wetlands falling under jurisdiction of the U.S. Army Corps of Engineers and regulated by the Clean Water Act are evident.

Characterization of the Vegetation

Vegetation and habitats occurring within the study area is characterized as ruderal habitat. The trees and shrubs present within the study area occur within the ruderal habitat and do not constitute a distinct vegetation community.

Ruderal Vegetation

Ruderal habitat is that from which the native vegetation has been completely removed by grading, cultivation, or other surface disturbances. Such areas, if left undeveloped, may become recolonized by invasive exotic species as well as native species. Within the study area, the entire site is dominated by ruderal vegetation, consisting primarily of non-native grasses and herbs typical of highly disturbed areas.

Characteristic non-native species occurring on site include ripgut brome (*Bromus diandrus*), wild oats (*Avena fatua*), filaree (*Erodium* spp.), wild mustard (*Brassica nigra*), yellow star thistle (*Centaurea solstitialis*), prickly lettuce (*Lactuca serriola*), rough cat's-ear (*Hypochaeris radicata*), milk thistle (*Silybum marianum*), artichoke thistle (*Cynara cardunculus*), common vetch (*Vicia sativa*), sweet fennel (*Foeniculum vulgare*) and bur-clover (*Medicago polymorpha*), among others. Native species detected on site include coyote brush (*Baccharis pilularis*), fireweed (*Epilobium brachycarpum*), and fiddleneck (*Amsinckia menziesii* var. *intermedia*). Scattered planted trees including walnuts (*Juglans* spp.), Siberian elm (*Ulmus pumilla*), Monterey pine (*Pinus radiata*), coast redwood (*Sequoia sempervirens*), yellow willow (*Salix lasiandra*), tree of heaven (*Ailanthus altissima*), poplars (*Populus* spp.) and Hollywood juniper (*Juniperus chinensis "Kaizuka"*) are also present.

A tree survey of the study area was conducted in 1993 (HortScience June 1993) in association with plans to construct a Wal-Mart on the site. The survey documented the presence of 53 planted and naturally occurring trees on site, including the presence of eight heritage trees (72 inches in circumference 4.5 feet above grade). Since completion of the 1993 tree survey, a small grove of poplar trees near the center of the property which were probably too small (less than 6 inches in diameter) to be surveyed have grown to tree stature, greater than six inches in diameter, 4.5 feet above grade. The present survey did not confirm the findings of the 1993 HortScience report. Additional trees within the study area may have achieved heritage tree stature in the intervening years, and some mortality of trees may have occurred.

Wildlife Habitats

Wildlife species expected to utilize the site are limited to those characteristic of ruderal habitats with scattered native and non-native trees. Wildlife values of the study area are limited by the industrial and suburban development surrounding the site, its isolation from areas of open space, the deposition of fill across much of the study area, and the high level of human activity adjacent to the site. Due to the placement of fill and for other unknown reasons, ground squirrels and other rodent activity appeared limited on site which decreases the value of the habitat for foraging raptors and other carnivorous animals. While the site is only one and one-half miles northwest of Lime Ridge Open Space, continuity of habitat between the study area and Lime Ridge is disrupted by industrial and suburban development. Pine Creek is contained within a concrete-lined channel to the west of the project site and is isolated from the site by concrete walls and chain link fence.

Ruderal Habitat

Ruderal habitat is that from which the native vegetation has been completely removed by grading, cultivation, or other surface disturbances. The entire site is characterized by ruderal habitat. Species generally associated with ruderal habitats include red fox (*Vulpes vulpes*), raccoon (*Procyon lotor*), Virginia opossum (*Didelphus virginianus*), European starlings (*Sturnus vulgaris*), and mourning dove (*Zenaida macroura*). There are some scattered trees which could provide nesting habitat for several bird species that are more tolerant of human disturbance such as the red-tailed hawk (*Buteo jamaicensis)* and American kestrel (*Falco sparverius*), among others.

Special-status Species and Natural Communities

Certain plants and wildlife species are designated as "special-status" taxa due to their overall rarity, endangerment, restricted distribution, and/or unique habitat requirements. In general, it is a combination of these factors that leads to the designation of a species as sensitive. The Federal Endangered Species Act (FESA), enacted by Congress in 1973, outlines the procedures whereby species are listed as endangered or threatened and established a program for the conservation of such species and the habitats in which they occur. Many individual states have enacted their own listing procedures to provide for the protection of additional locally sensitive biological resources. The California Endangered Species Act (CESA) of 1984 amends the California Fish and Game Code to protect species deemed to be locally endangered and essentially expands the number of species protected under the FESA.

The CDFG has also compiled a list of wildlife "Special Animals" (CDFG 1998b) and "Special Plants" (CDFG 1999). These designations are given to those wildlife species whose breeding populations are in serious decline and to those plant species whose habitats are seriously threatened. Although these species may be abundant elsewhere they are considered to be at some risk of extinction in California. Although Species of Special Concern are afforded no official legal status under FESA or CESA, they may receive special consideration during the planning stages of certain development projects and adverse impacts may be deemed significant under the California Environmental Quality Act (CEQA). An explanation of all sensitivity codes is provided in Appendix E.

Special-Status Plant Species

Special-status plant species include those listed as either Endangered, Threatened, Rare or Candidates for listing by the USFWS (1995, 1996), the CDFG (1998a, b) and the CNPS (Skinner and Pavlik 1997). The CNPS listing is sanctioned by the CDFG and serves essentially as their list of "candidate" plant species.

Information on special-status plant species was compiled through a review of the California Native Plant Society's (CNPS) *Electronic Inventory of Rare and Endangered Vascular Plants of California* (Skinner and Pavlik 1999), the California Department of Fish and Game's (CDFG) *Special Plants List* (CDFG 1999), *State and Federally Listed Endangered, Threatened, and Rare Plants of California* (CDFG 1998a), the U.S. Fish and Wildlife Service's (USFWS) *Endangered and Threatened Wildlife and Plants* (USFWS 1995) and *Endangered and Threatened Plant and Animal Taxa; Proposed Rule* (USFWS 1996). Also reviewed were *Status of Rare, Threatened and Endangered Vascular Plants in Alameda and Contra Costa Counties (and some adjacent areas)* (Olson 1994) and *Unusual and Significant Plants of Alameda and Contra Costa Counties* (Lake 1999).

A reconnaissance-level survey of the proposed project site was conducted on April 16, 1999. The entire study area was surveyed on foot. All distinct plant communities were visited and described. The visit was intended only as an initial evaluation of on-site habitat types. Focused surveys were not conducted. While this survey was conducted in an appropriate season to detect early and mid-spring flowering special-status species, on its own the survey does not conform to California Department of Fish and Game's *Guidelines for Assessing the Effects of Proposed Developments on Rare and Endangered Plants and Plant Communities* (CDFG 1984).

Based on a literature review, a total of 32 special-status plant taxa were determined to have some potential for occurring in the project vicinity. None of these target species were detected during the reconnaissance-level survey and none are considered to have any potential to occur within the study area due to lack of suitable habitat and the highly disturbed nature of the site. A summary of the status, habitat affinities, reported localities in the project area, blooming period, and potential for occurrence on site for each of the target plant species is presented in Table 4.5-1. An explanation of sensitivity status codes used in this table is presented in Appendix E.

Based upon a single reconnaissance-level survey and habitat assessment at the project site, no state- or federally-listed Endangered, Threatened, Rare or candidate plant species were detected, and none are expected to occur. No further botanical surveys are warranted.

Special-Status Animal Species

Special-status wildlife species include those listed as Endangered, Threatened, or Rare or candidate species for listing by the USFWS (1995, 1996) and the CDFG (1998c). Additional species that may be considered sensitive are those listed as Special Animals by the CDFG (1998b). Additional species receive federal protection under the Bald Eagle Protection Act (e.g., bald eagle, golden eagle), the Migratory Bird Treaty Act and species specifically protected under CEQA Section 15380(d).

A reconnaissance-level survey of wildlife habitats on the site was conducted on April 16, 1999. Portions of the site were visually surveyed to evaluate how the site might be utilized by wildlife species. Focused wildlife surveys were not conducted as part of this survey effort. A list of potentially occurring special-status vertebrate wildlife species, and their legal status is included in Table 4.5-2.

Many special-status wildlife species occur in the region but are not considered to have any potential to occur on site due to the fact that the project site does not provide habitat or other key resources that would meet their requirements, or because the study area is outside their local range.

No state- or federally-listed Endangered, Threatened, Rare or candidate animal species were detected during a single reconnaissance-level survey and habitat assessment at the Concord Costco project site.

Based on a review of the California Natural Diversity Data Base (CNDDB 1999), a number of special-status animal species have been recorded in the project vicinity. Several of these species are not considered likely to occur on site due to a number of factors including the lack of suitable habitat or isolation from suitable habitat. These species include the California red-legged frog (*Rana aurora draytonii*), the California tiger salamander (*Ambystoma californiense*), the western pond turtle (*Clemmys marmorata*), the Alameda whipsnake (*Masticophis lateralis euryxanthus*), the Berkeley kangaroo rat (*Dipodymus heermanii berkeleyensis*) and the Bridges' Coast Range shoulderband snail (*Helminthoglypta nickliniana bridgesii*).

There is low likelihood that several special-status birds and bats could occur on site. The larger trees, especially the trees near the northwest corner of the site could provide nesting habitat for several raptors including the red-tailed hawk, which is protected under the Migratory Bird Treaty Act. The buildings on site could potentially provide roosting habitat for several bat species that are state-listed Species of Special Concern and/or were formally federally-listed Species of Concern.

Table 4.5-1
Potentially-Occurring Special-Status Plant Species
at the Concord Costco Project Site

Family Species	Status[1]	Habitat Affinities and Reported Localities in the Project Area	Blooming Period/ Life Form	Potential for Occurrence On Site
Apiaceae *Sanicula saxatilis* rock sanicle	USFWS SOC CDFG CR CNPS 1B:3-2-3	Broadleaf upland forests, chaparral, valley/foothill grassland, on bedrock outcrops and talus slopes. Restricted to Contra Costa and Santa Clara Counties. Occurs on Mt. Diablo and Eagle Peak.	April-May Perennial herb	None: no suitable habitat onsite.
Asteraceae *Blepharizonia plumosa* ssp. *plumosa* big tarplant	USFWS none CDFG CEQA CNPS 1B:3-3-3	Valley/foothill grasslands, on dry sites. Extant in Alameda and possibly Contra Costa counties. Believed extinct in San Joaquin, Stanislaus and Solano Counties.	July-Oct Annual herb	None: no suitable habitat onsite.
Helianthella castanea Diablo helianthella	USFWS SOC CDFG CEQA CNPS 1B:3-2-3	Broadleaf upland forest, chaparral, cismontane woodland coastal scrub, riparian woodland, and valley/foothill grassland. Occurs in Alameda, Contra Costa and San Mateo Counties; presumed extinct in Marin and San Francisco Counties. Occurs on Mt. Diablo.	April-June Perennial herb	None: no suitable habitat onsite.
Hemizonia parryi ssp. *congdonii* Congdon's tarplant	USFWS SOC CDFG CEQA CNPS 1B:3-3-3	Valley-foothill grasslands on alkaline soils. Restricted to San Luis Obispo, Monterey, and possibly Santa Clara Counties; presumed extinct in Alameda, Contra Costa, Santa Cruz, and Solano Counties.	June-Nov Annual herb	None: no suitable habitat onsite.
Holocarpha macradenia Santa Cruz tarplant	USFWS SOC CDFG CE CNPS 1B:2-3-3	Coastal prairie, valley/foothill grassland, often clay soils. Known from Contra Costa, Santa Cruz Counties; presumed extinct in Marin and Alameda Counties.	June-Oct Annual herb	None: no suitable habitat onsite.

Table 4.5-1 *(cont.)*

Family Species	Status[1]	Habitat Affinities and Reported Localities in the Project Area	Blooming Period/ Life Form	Potential for Occurrence On Site
Lasthenia conjugens Contra Costa goldfields	USFWS FE CDFG CEQA CNPS 1B:3-3-3	Mesic sites in valley/foothill grassland, vernal pools. Restricted to Napa and Solano Counties; Barbara and Santa Clara Counties. extinct in Alameda, Contra Costa, Mendocino, Santa	Mar-June Annual herb	None: no suitable habitat onsite.
Madia radiata showy madia	USFWS none CDFG CEQA CNPS 1B:2-3-3	Valley/foothill grasslands below 250 feet, and cismontane woodland. Occurs throughout the Central Coast and Central Valley.	March-May Annual herb	None: no suitable habitat onsite. Presumed extinct in Contra Costa County.
Micropus amphibolus Mt. Diablo cottonweed	USFWS none CDFG CEQA? CNPS 4:1-1-3	Broadleaf upland forest, cismontane woodland, valley/ foothill grassland. Known from Lake to Santa Cruz Counties, San Francisco Bay Area.	April-May Annual herb	None: no suitable habitat onsite.
Senecio aphanactis rayless ragwort	USFWS none CDFG CEQA? CNPS 2:3-2-1	Chaparral, cismontane woodland and coastal scrub (alkaline).	January-April Annual herb	None: no suitable habitat onsite.
Boraginaceae *Amsinckia grandiflora* large-flowered fiddleneck	USFWS FE CDFG SE CNPS 1B:3-3-3	Cismontane woodland, valley/foothill grassland. Known from only three natural occurrences in Alameda, Contra Costa and San Joaquin Counties. Occurs at Black Diamond Mines Regional Preserve.	April-May Annual herb	None: no suitable habitat onsite.
Amsinckia lunaris bent-flowered fiddleneck	USFWS none CDFG CEQA? CNPS 4:1-1-3	Open woods, valley/foothill Grasslands. Reported from the vicinity of San Francisco Bay to Lake, Shasta, and Siskiyou Counties	Mar-June Annual herb	None: no suitable habitat onsite.
Cryptantha hooveri Hoover's cryptantha	USFWS none CDFG CEQA? CNPS 4:1-2-3	Valley/foothill grassland, on sandy soils. Known from Alameda, Contra Costa, Madera, Merced, Stanislaus, and San Joaquin Counties.	April-May Annual herb	None: no suitable habitat onsite.
Brassicaceae *Streptanthus albidus* ssp. *peramoenus* most beautiful jewel-flower	USFWS SOC CDFG CEQA CNPS 1B:2-2-3	Chaparral, cismontane woodland and valley/foothill grasslands on serpentinite. Known from Alameda, Santa Clara and Contra Costa Counties. Occurs on Mt. Diablo.	April-June Annual herb	None: no suitable habitat onsite.

Table 4.5-1 *(cont.)*

Family Species	Status[1]	Habitat Affinities and Reported Localities in the Project Area	Blooming Period/ Life Form	Potential for Occurrence On Site
Streptanthus hispidus Mt. Diablo jewel-flower	USFWS SOC CDFG CEQA CNPS 1B:3-1-3	Chaparral and valley/foothill grassland on serpentine rock outcrops. Restricted to Contra Costa County. Occurs on Mt. Diablo and Eagle Peak.	Mar-June Annual herb	None: no suitable habitat onsite.
Tropidocaprum capparideum caper-fruited tropidocarpum	USFWS SOC CDFG CEQA CNPS 1A	Valley/foothill grasslands (alkaline hills). Known historically from Alameda, Contra Costa, Glenn, Monterey, Santa Clara and San Joaquin Counties; presumed extinct. Last seen in1957. Know to have occurred in Clayton.	Mar-April Annual herb	None: no suitable habitat onsite.
Chenopodiaceae *Atriplex joaquiniana* San Joaquin spearscale	USFWS SOC CDFG CEQA CNPS 1B:2-2-3	Chenopod scrub, meadows, playas, Valley/foothill grasslands (alkaline).	April-Sept. Annual herb	None: no suitable habitat onsite.
Convolulaceae *Convolvulus simulans* small-flowered morning-glory	USFWS none CDFG CEQA? CNPS 4:1-2-2	Chaparral (openings), coastal scrub, Valley/foothill grassland, in clay and serpentine seeps. Known from the Bay Area and San Joaquin Valley, Central Coast and Channel Islands to San Diego County.	Mar-June Annual herb	None: no suitable habitat onsite.
Fabaceae *Astragalus tener* var. *tener* alkali milk vetch	USFWS none CDFG CEQA CNPS 1B:3-2-3	Playas, valley/foothill grasslands on adobe clay, and alkaline vernal pools. Extant in Merced, Solano and Yolo Counties. Extinct throughout the Bay Area and San Joaquin Valley.	March-June Annual herb	None: no suitable habitat onsite.
Hydrophyllaceae *Phacelia phacelioides* Mt. Diablo phacelia	USFWS SOC CDFG CEQA CNPS 1B:2-2-3	Chaparral and cismontane woodland (rocky). Known only from the Diablo Range in Contra Costa, Santa Clara, Stanislaus, and San Benito counties; possibly from Alameda County.	April-May Annual herb	None: no suitable habitat onsite.
Juglandaceae *Juglans californica* var. *hindsii* Northern California black walnut	USFWS SOC CDFG CEQA CNPS 1B:3-3-3	Riparian forests and riparian woodlands. Known from only two extant populations in Napa and Contra Costa Counties. Presumed extinct in Sacramento, Solano and Yolo Counties. Widely naturalized in cismontane Calif., used as a root stock for *J. regia*.	April-May Deciduous tree	None: no suitable habitat onsite.

Table 4.5-1 *(cont.)*

Family Species	Status[1]	Habitat Affinities and Reported Localities in the Project Area	Blooming Period/ Life Form	Potential for Occurrence On Site
Liliaceae *Calochortus pulchellus* Mt. Diablo fairy lantern	USFWS none CDFG CEQA CNPS 1B:2-2-3	Chaparral, cismontane woodland, valley/foothill grassland. Recorded from Contra Costa County in the vicinity of Mt. Diablo. Questionably reported from Solano County.	April-June Perennial herb (bulbiferous)	None: no suitable habitat onsite.
Calochortus umbellatus Oakland star-tulip	USFWS none CDFG CEQA? CNPS 4:1-2-3	Broadleafed and upland forest, chaparral, lower montane coniferous forest, Valley/foothill grassland, often on serpentinite. Known from Alameda, Contra Costa, Marin, Santa Clara and San Mateo Counties. Presumed extirpated in Santa Cruz County.	Mar-May Perennial herb (bulbiferous)	None: no suitable habitat onsite.
Fritillaria agrestis stinkbells	USFWS none CDFG CEQA? CNPS 4:1-2-3	Chaparral, cismontane woodland, valley/foothill grassland on clay or sometimes serpentinite. Fairly widespread from Santa Barbara to Mendocino counties and east to the Sierra foothill Counties.	Mar-April Perennial herb	None: no suitable habitat onsite.
Fritillaria liliaceae fragrant fritillary	USFWS SOC CDFG CEQA CNPS 1B:1-2-3	Coastal prairie, coastal scrub, valley/foothill grassland near the coast, on clay soil often serpentinite. Known throughout the Central Coast from Sonoma to Monterey Counties and the San Francisco Bay Area. Occurs in Diablo Foothills Regonal Park on Shell Ridge.	Feb-April Perennial herb	None: no suitable habitat onsite.
Linaceae *Hesperolinon breweri* Brewer's dwarf flax	USFWS SOC CDFG CEQA CNPS 1B:2-2-3	Chaparral, cismontane woodlands, valley/foothill grassland, mostly on serpentinite. Found in Napa, Solano, and Contra Costa Counties. Occurs on Mt. Diablo.	May-July Annual herb	None: no suitable habitat onsite.
Malvaceae *Malacothamnus hallii* Hall's bush mallow	USFWS none CDFG CEQA CNPS 1B:3-2-3	Chaparral. Known from Contra Costa, Merced, Santa Clara and possibly Alameda Counties.	May-Sept. Shrub (evergreen)	None: no suitable habitat onsite.
Papaveraceae *Eschscholzia rhombipetala* diamond-petaled California poppy	USFWS SOC CDFG CEQA CNPS 1A	Valley/foothill grassland on clay soils. Presumed extinct. Known historically from Alameda, Contra Costa, Colusa, San Luis Obispo and Stanislaus Counties. Last seen in 1950.	Mar-April Annual herb	None: no suitable habitat onsite.

Table 4.5-1 *(cont.)*

Family Species	Status[1]	Habitat Affinities and Reported Localities in the Project Area	Blooming Period/ Life Form	Potential for Occurrence On Site
Polemoniaceae *Linanthus ambiguus* serpentine linanthus	USFWS none CDFG CEQA? CNPS 4:1-2-3	Cismontane woodland, coastal scrub, Valley/foothill grassland, usually on serpentinite. Known from the Bay Area and San Joaquin Valley.	Mar-June Annual herb	None: no suitable habitat onsite.
Polygonaceae *Eriogonum truncatum* Mt. Diablo buckwheat	USFWS none CDFG CEQA CNPS 1A	Chaparral, coastal scrub, valley/foothill grassland on sandy soils. Presumed extinct; known historically from Alameda, Contra Costa and Solano Counties. Last seen in 1936 on Mt. Diablo.	April-Sept Annual herb	None: no suitable habitat onsite.
Ranunculaceae *Delphinium californicum* ssp. *interius* Hospital Canyon larkspur	USFWS SOC CDFG CEQA CNPS 1B:3-2-3	Cismontane woodland, possible on mesic sites. Recorded from Alameda, Contra Costa, Santa Clara, San Joaquin, and San Luis Obispo Counties.	April-June Perennial herb	None: no suitable habitat onsite.
Ranunculus lobbii Lobb's aquatic buttercup	USFWS none CDFG CEQA? CNPS 4:1-2-3	Mesic sites in cismontane woodland, valley/foothill grassland, northern coniferous forest and vernal pools. Known in the San Francisco Bay Area to Mendocino and Napa Counties.	March-May Annual herb (aquatic)	None: no suitable habitat onsite.
Scrophulariaceae *Cordylanthus nidularius* Mt. Diablo bird's beak	USFWS SOC CDFG CR CNPS 1B:3-3-3	Chaparral (serpentine). Known only from a single occurrence on Mt. Diablo.	July-Aug. Annual herb (hemiparasitic)	None: no suitable habitat onsite.

[1] Explanation of sensitivity status codes provided in Appendix E.

Source: *Sycamore Associates LLC — Biological Assessment of the Concord Costco Site*, April 1999.

Table 4.5-2
Potentially-Occurring Special-Status Wildlife Species at the Concord Costco Project Site

Scientific Name Common Name	Status[1]	Habitat Affinities and Reported Localities in the Project Area	Potential for Occurrence On site
Invertebrates			
Helminthoglypta nickliniana bridgesi Bridges coast range shoulderband (snail)	Federal SC State none	Inhabits open hillsides of Alameda and Contra Costa Counties, tends to colonize under tall grasses and weeds	Low: isolated from suitable habitat and little suitable habitat present on site
Amphibians			
Ambystoma tigrinum californiense California tiger salamander	Federal SC State SSC	Breeds in temporary or semi-permanent pools. Seeks cover in rodent burrows in grasslands and oak woodlands. Inhabits the Coast Ranges from Santa Barbara to Sonoma counties along the coast and inland to Colusa, Yolo and Tulare counties.	None: isolated from potential breeding habitat
Rana aurora draytonii California red-legged frog	Federal FT State SSC	Prefers semi-permanent and permanent stream pools, ponds and creeks with emergent and/or riparian vegetation. Occupies upland areas especially during the	None: isolated from suitable breeding habitat wet winter months.
Reptiles			
Clemmys marmorata western pond turtle	Federal SC State SSC, CP	Prefers permanent, slow-moving creeks, streams, ponds, rivers, marshes and irrigation ditches with basking sites and a vegetated shoreline. Needs upland sites for egg-laying. Occurs from the Oregon border to the San Francisco Bay, inland throughout the Sacramento Valley and south along the coastal zone to San Diego County.	None: isolated from suitable habitat.

Table 4.5-2 *(cont.)*

Scientific Name Common Name	Status[1]	Habitat Affinities and Reported Localities in the Project Area	Potential for Occurrence On site
Reptiles			
Masticophus lateralis euryxanthus Alameda whipsnake	Federal FT State ST	Restricted to valley-foothill hardwood habitat of the Coast Ranges, inhabits south-facing slopes and ravines where the shrubs form a vegetative mosaic with *oak trees and grasses.*	None: no suitable habitat present and ***site isolated from known*** *occurrences.*
Birds			
Buteo jamaicensis Red-tailed hawk	Federal MB State none	Nests in woodlands, feeds in open country. Often perches on poles or treetops.	Low: marginal foraging and nesting habitat present.
Circus cyaneus northern harrier (nesting/wintering)	Federal MB State SSC	Nests and forages in grasslands ranging from salt grass in desert sinks to mountain cienagas. Nests on ground in shrubby vegetation or marsh.	Low: marginal foraging habitat present
Elanus leucurus white-tailed kite (nesting sites)	Federal MB State CFP Audubon none	Inhabits low rolling foothills and valley margins with scattered oaks and river bottom lands or marshes adjacent to deciduous woodlands. Prefers open grasslands, meadows and marshes for foraging close to isolated, dense-topped trees for nesting and perching.	Low: marginal nesting and foraging habitat present.
Eremophila alpestris actia California horned lark	Federal MB State SSC Audubon none	Nests on ground in open grassland. Known from vicinity of San Francisco Bay.	Low: marginal foraging habitat present.

Table 4.5-2 *(cont.)*

Scientific Name Common Name	Status[1]		Habitat Affinities and Reported Localities in the Project Area	Potential for Occurrence On Site
Birds (cont'd)				
Falco peregrinus anatum American peregrine falcon	Federal State Audubon	FE, MB CE, CFP none	Nests and roosts on protected ledges of high cliffs, bridges or buildings, usually adjacent to lakes, rivers or marshes. Permanent resident in the North and South Coast Ranges. Winters in the Central Valley southward through the Transverse and Peninsular Ranges.	Low: may occasionally forage on site. Nest recorded at the Antioch bridge.
Lanius ludovicianus loggerhead shrike	Federal State Audubon	SC, MB SSC Blue List	Open grasslands at margins of woodland and scrub habitats. Often uses lookout perches such as fence posts. Resident and winter visitor in lowlands and foothills throughout California.	Low: marginal nesting and foraging habitat present
Speotyto cunicularia burrowing owl	Federal State Audubon	SC, MB SSC SC	Open, dry grasslands, deserts, prairies, farmland and scrublands with abundant active and abandoned mammal burrows. Occurs in lowlands throughout California.	Low: marginal foraging habitat present.
Mammals				
Antrozous pallidus pallid bat	Federal State	none SSC	Found in grasslands, shrublands, woodlands and forest from sea level through mixed conifer forests. Prefers rocky outcrops, cliffs and crevices with access to open habitats for foraging. Roosts must be protected from heat. Known from vicinity of San Francisco Bay. Nearest recorded location at Tracy.	Low: marginal roosting habitat present. Could forage on site and in vicinity.
Corynorhinus (Plecotus) townsendii townsendii Townsend's western big-eared bat	Federal State	SC SSC	Inhabits humid coastal regions of northern and central California. Roosts in limestone caves, lava tubes, mines, buildings, etc. Will only roost in open areas, hanging from walls and ceilings. Suitable roosting sites extremely limited and	Low: marginal roosting habitat present. Could forage on site species. is highly sensitive to disturbance. Known from San Francisco Bay. Nearest recorded location at Tracy.

Table 4.5-2 *(cont.)*

Scientific Name Common Name	Status[1]	Habitat Affinities and Reported Localities in the Project Area	Potential for Occurrence on site
Dipodomys heermanni berkeleyensis	Federal SC State	Inhabits open grassy hilltops and open spaces and open spaces in chapparal none	None: no suitable habitat woodlands and blue oak/digger pine woodlands; last reported sighting in 1936 on site
Berkeley kangaroo rat		1 mile west of Mt. Diablo; needs fine, deep, well drained soil for burrowing	
Eumops perotis californicus western mastiff bat	Federal none State SSC	Inhabits many open, semi-arid to arid habitats, including conifer and deciduous woodlands, coastal scrub, grasslands and chaparral. Roosts in crevices in cliff Faces, high buildings, trees and tunnels. Known from vicinity of San Francisco Bay.	Low: marginally suitable roosting habitat present. Could forage on site.
Myotis volans long-legged myotis	Federal SC State none	Roosts colonially in buildings and crevices in rock ledges. Distributed throughout the western U.S., Mexico and Canada.	Low: marginal roosting habitat present. Could forage on site.
Myotis yumanensis Yuma myotis bat	Federal SC State SSC	Roosts colonially in caves, tunnels and buildings. Inhabits arid regions. Distributed throughout the western U.S., Mexico and Canada.	Low: potential roosting habitat present. Could forage on site.
Perognathus inornatus inornatus San Joaquin pocket mouse	Federal SC State none	Found in grasslands and blue oak savannas, needs friable soils.	None: no suitable habitat on site.

[1] Explanation of sensitivity status codes provided in Appendix E.

Source: *Sycamore Associates LLC — Biological Assessment of the Concord Costco Site*, April 1999.

Sensitive Habitats and Plant Communities

Special-status habitats are those which are considered rare in the region, support special-status plant or wildlife species, or receive regulatory protection (i.e., § 404 of the Clean Water Act and/or the CDFG §§ 1600 *et seq.* of the California Fish and Game Code). In addition, the CNDDB has designated a number of communities as rare; these communities are given the highest inventory priority (Holland 1986; CDFG 1999).

A wetlands assessment was conducted on April 16, 1999, to determine whether potential wetlands or waters of the U.S. subject to the jurisdiction of the U.S. Army Corps of Engineers were present. Based on the wetlands assessment, no wetlands or waters of the U.S. are present within the study area; therefore conduct of a formal wetlands delineation is not warranted.

The study area does not support any special-status natural communities. No rivers, streams, lakes or sensitive habitats are present within the study area.

Regulatory Framework

Project implementation requires the approval of the City of Concord. The absence of any waters of the U.S., including wetlands within the study area eliminates the need for permits associated with dredge or fill of waters of the U.S. from the Army Corps of Engineers, California Regional Water Quality Control Board or California Department of Fish and Game. Consultation with resource agencies such as California Department of Fish and Game and U.S. Fish and Wildlife Service regarding special-status plants, animals or habitats is not needed because none are present.

Consistency with Applicable Plans and Policies

The City of Concord's General Plan and Municipal Code contain goals, objectives, policies and ordinances regarding biological resources. The proposed project is expected to be consistent with both the elements of the General Plan and Municipal Code, as described below.

> **GOAL 3: Conservation** Conserve natural resources, including water, wildlife, vegetation, minerals, and energy.

Implementation of this goal is addressed in a number of specific resource objectives, which are further defined through specific policies.

> ***Objective 3.1: Water Quality.*** Improve the quality of underground and surface waters and protect waters from degradation due to discharge of toxic chemicals, erosion, and sedimentation.
>
> > **Policy 3.1.1** Improve the quality of underground and surface waters in Concord through coordination with Contra Costa County Flood Control and Water Conservation District, the Soil Conservation District, the Contra Costa Water District, and the Regional Water Quality Control Board.

Objective 3.4: Wildlife and Vegetation Resources. Identify and protect wildlife and vegetation resources of significant biological and ecological value.

Policy 3.4.4 Take into account the impact of construction on significant vegetation and require tree preservation measures to be implemented in project development.

Policy 3.4.5 Preserve trees to the extent feasible.

Policy 3.4.6 Plant new trees to increase benefits to wildlife.

City of Concord Municipal Code Article IV, Chapter 3, Sections 4301 - 4311 provides a definition of heritage trees, prohibition of heritage tree removal without a permit from the City, requirements for permits to remove heritage trees on public and private property and requirements for the protection of heritage trees during construction. In summary, the City of Concord defines a heritage tree to be a tree which is at least seventy-two (72) inches in circumference (approximately 24 inches in diameter) measured four and one-half (4-½) feet above natural or established grade. Provisions are made for the definition of heritage trees that have special significance, but do not have the required size to be automatically defined as heritage trees. Heritage trees may not be removed on either public or private property without a permit from the City of Concord. Required protection of heritage trees during construction includes dripline fencing, prohibition of earthwork within the dripline, storage or disposal of harmful materials within the dripline or in areas likely to drain to heritage trees and location of utility services or irrigation lines within the dripline of heritage trees.

Consistency with City of Concord Objectives and Policies and Municipal Code

The proposed project is consistent with the goals, objectives, policies of the General Plan and the City of Concord Municipal Code. Development of the 21.4-acre site for a Costco wholesale center is consistent with surrounding uses.

Water quality of the off-site Pine Creek, and underground water will be protected through careful site planning, treatment of storm water runoff and an underground storage tank for the gas station. No surface water is present on site and the reach of Pine Creek near the project site is contained in a concrete-lined channel.

No wildlife or vegetation resources of significant biological and ecological value are present within the project area.

Although eight heritage trees were identified during the HortScience tree survey (HortScience 1993), none are believed to be indigenous to the site. The number of heritage trees present on site was not confirmed during the present survey. Where tree preservation is not feasible, new trees will be incorporated into the landscaping to mitigate removals. Tree removal permits will be obtained prior to the removal of heritage trees.

No significant impacts to biological resources are anticipated after implementation of mitigation measures.

Impacts and Mitigation Measures

Significance Criteria

The proposed project has the potential to produce three different types of project-related impacts to biological resources: direct impacts, indirect impacts, and cumulative impacts. Direct impacts may be short-term or long-term, and may occur when biological resources are altered, destroyed, or removed during the course of project construction. Such direct impacts include removal of vegetation by grading or filling; loss of individual organisms due to habitat clearing and/or construction-related mortalities; loss of foraging, nesting, or burrowing habitat for wildlife species; and habitat disturbance which results in conditions unfavorable to natural regeneration of the vegetation.

Indirect impacts may also be short-term or long-term, and may occur when project-related activities affect, in an indirect manner, biological resources (e.g., increased noise, erosion, sedimentation, and dust).

Cumulative impacts are the sum of all impacts that occur throughout the project area or region, from this and other projects and include cumulative loss of foraging habitat, habitat fragmentation, and loss of movement corridors.

Significance criteria are based CEQA guidelines, interpretation and application of City of Concord General Plan policies, and guidelines provided in Nelson (1981). Impacts resulting from the project are considered to be significant if the project would:

- substantially affect a rare or endangered species of animal or plant or the habitats of the species;
- affect high quality or undisturbed biological communities, vegetation associations, and habitats that are restricted on a regional basis or serve as a wildlife corridor or buffer;
- interfere substantially with the movement of any resident or migratory fish or wildlife species;
- impact habitats that serve as breeding, feeding, nesting, or migrating ground and are limited in availability, or serve as core habitats for regional plant, wildlife, or fish populations;
- impact biological resources of scientific interest because they are at their physical or geographic limits or represent an unusual variation in a population or community; or
- impact habitats that are key to the maintenance of localized plant and animal populations, even if these habitats are not biologically significant on a regional scale (i.e., impacts would be locally, but not regionally significant).

Impacts are considered adverse but non-significant if:

- as a result of construction, operation, or maintenance of a proposed project, impacts would not significantly change or stress the resources on a long-term basis; and
- the project would result in impacts to biological resources that are already disturbed or lack importance in the preservation of local or regional native biological diversity and productivity.

Impacts are considered beneficial if:

- the action causes no detrimental impacts and results in an increase in habitat quality and quantity.

Under CEQA Section 15065, a mandatory finding of significance is required if a project has the potential to: a) substantially degrade the quality of the environment, substantially reduce the habitat of fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal, or eliminate important examples of the major periods or California history or prehistory; b) achieve short-term environmental goals to the disadvantage of long-term environmental goals; c) cause possible environmental effects which are individually limited but cumulatively considerable, or d) cause substantial adverse effects on human beings, either directly or indirectly.

Approach to Impact Analysis

Potential direct and indirect effects on biological resources in the study area were determined by an analysis of the proposed project on all potentially significant biological resources. Impacts and mitigation measures are discussed below. Impacts were determined to be direct and permanent when a particular resource would be replaced by some feature of the design. Impacts were determined to be indirect when a particular resource would be encroached upon by design features or activities associated with its construction. Routine construction activities were evaluated and all potential indirect impacts were considered. Cumulative impacts were analyzed in relation to this project's location relative to the surrounding urban area and open space two to three miles distant from the project site. The sphere of influence for impact evaluation includes the project site, surrounding urban area, and open space at Lime Ridge Open Space within approximately one and one-half miles of the project site.

Project Impacts

IMPACT 4.5-1: Project construction will require the removal of approximately 53 trees, including possible removal of eight heritage trees. This is a *less-than-significant* impact.

Removal of the approximately 53 trees, including the eight heritage trees, would reduce or eliminate tree cover within the project area in the short term, prior to the installation of landscape trees. None of the heritage trees, or other trees within the project area however, are significant or unique in terms of stature, age, size, appearance or species, and their removal and replacement with landscape trees would not result in a significant impact.

The Conceptual Landscape Plan shown in Figure 2-3 provides a list of trees that will be planted on site. The project sponsor proposes a mix of more than 300 trees throughout the site.

❑ **MITIGATION MEASURE 4.5-1:** None is required.

IMPACT 4.5-2: Water quality in Pine Creek could be adversely affected by construction activities. This is a *potentially significant* impact.

Water quality in Pine Creek could be adversely affected during construction if sediment-laden runoff from the construction site were to drain directly to Pine Creek without any filtering or detention. This in turn could have an adverse impact on vegetation and wildlife in the creek. Construction activities including topsoil stockpiling, work and equipment staging areas, and fueling and maintenance have the potential to directly deposit soil and/or pollutants into Pine Creek, or result in sediment-laden or polluted runoff to the creek.

❑ **MITIGATION MEASURE 4.5-2A:** Prior to the initiation of any grading or land clearing in areas that could drain to Pine Creek, the project sponsor shall prepare and implement a Storm Water Pollution Prevention Plan (SWPPP). This plan shall be consistent with the applicable requirements of Contra Costa County's non-point source NPDES program. The plan should prevent the movement of sediment from the upland areas subject to construction into the off-site Pine Creek.

MONITORING

Mitigation Implementation:	*Project Sponsor*
Monitoring Requirement:	*Confirm preparation of SWPPP and approval by Regional Water Quality Control Board. City to field check implementation of plan.*
Responsibility for Monitoring:	*Regional Water Quality Control Board and City Construction Division*
Timing:	*SWPPP must be approved prior to issuance of grading permit. Field checks shall occur periodically during construction.*

❑ **MITIGATION MEASURE 4.5-2B:** Any topsoil to be stockpiled shall be located in areas on the site where runoff to Pine Creek will not occur.

MONITORING

Mitigation Implementation:	*Project Sponsor*
Monitoring Requirement:	*Approve and inspect suitable stockpile locations*
Responsibility for Monitoring:	*City Construction Division*
Timing:	*Prior to issuance of grading permit. Conduct periodic on-site inspections during grading.*

❑ **MITIGATION MEASURE 4.5-2C:** Equipment storage and staging areas shall be located in disturbed areas or areas within the development envelope where runoff to Pine Creek will not occur.

MONITORING

Mitigation Implementation:	*Project Sponsor*
Monitoring Requirement:	*Approve and inspect locations of staging areas*
Responsibility for Monitoring:	*City Construction Division*
Timing:	*Prior to issuance of grading permit. Conduct periodic on-site inspections.*

❑ **MITIGATION MEASURE 4.5-2D:** Fueling and maintenance of equipment shall be conducted in the northeast corner of the project site or along the Detroit Avenue corridor to prevent any leakage or runoff into Pine Creek.

MONITORING

Mitigation Implementation:	*Project Sponsor*
Monitoring Requirement:	*Approve and inspect location for fueling/ maintenance of equipment*
Responsibility for Monitoring:	*City Construction Division*
Timing:	*Prior to issuance of grading permit and periodically during construction*

IMPACT 4.5-3: Conversion of the ruderal habitat will result in the loss of foraging habitat for various animal species. This is a *less-than-significant* impact.

The conversion of ruderal habitat present on site is not considered a significant adverse environmental effect given the highly degraded nature of habitat present within the study area, isolation from habitats in open space areas approximately one and one-half miles away, and location within a highly urbanized area.

❑ **MITIGATION MEASURE 4.5-3:** None is required.

IMPACT 4.5-4: Development of the project site could result in the loss of potential breeding habitat for migratory birds and potential roosting habitat for special-status bat species due to removal of 53 trees and demolition of existing buildings. This is a *potentially significant* impact.

Potential nesting habitat for several migratory bird species is present in some of the trees on site and removal of the trees will eliminate this potential nesting habitat. Installation of landscape trees will not replace the potential nesting habitat associated with the existing trees due to generally smaller size of the replacement trees, the loss of surrounding foraging habitat and the extent of human activity on site once it is developed. Project construction also could result in the disturbance and direct loss of bat roosts if present in the trees and buildings on site. The demolition of buildings in the northwest corner of the site would eliminate potential roosting habitat for several bat species. The buildings proposed for the site will not replace the existing potential bat roosting because the proposed use would most likely discourage bats frequenting the site. This impact could be considered significant because of the loss of breeding and nesting habitats that may be limited in availability and may be key to the maintenance of localized populations. In addition, individual non-game mammals are protected under Chapter 3, Article 1, Section 4150 in Fish and Game Code (1999).

Project construction that occurs during the breeding season (usually between February and August) could result in disturbance and direct loss of active nests of migratory birds if present on site. This could be considered significant if a nest protected under the Migratory Bird Treaty Act is directly taken or disturbed.

Project construction, the removal of trees and demolition of buildings could directly and indirectly affect individual species and their nests.

❑ **MITIGATION MEASURE 4.5-4:** A biological survey shall be conducted of all on-site trees and buildings that may contain roosting sites. The survey should begin no more than 30 days prior to construction. This survey will determine if nests of protected bird and special-status bat species' roosting sites are present on site. If active nests or roosts are present, recommendations on construction buffers, scheduled removal of the trees and/or buildings shall be developed and any other protective measures will be made. These measures would require the approval of California Department of Fish and Game. Once the measures have been approved by the California Department of Fish and Game, they will be implemented.

MONITORING

Mitigation Implementation:	*Project Sponsor*
Monitoring Requirement:	*Hire wildlife biologist to be paid by project sponsor. Confirm completion of survey by wildlife biologist.*

Responsibility for Monitoring:	*City Planning Division and California Department of Fish and Game*
Timing:	*60 days prior to start of site preparation activities to retain wildlife biologist. 30 days prior to start of site preparation activities to complete survey.*

Indirect Impact

IMPACT 4.5-5: Runoff from the gas station and the parking lot could pollute Pine Creek. This is a *potentially significant* impact.

Gas station runoff is potentially contaminated with oil, gasoline, grease and other pollutants, and if discharged directly into Pine Creek, could be a significant source of pollution. The parking lot will be swept two to three times weekly and Fossil Filters or an approved equal product will be installed to prevent runoff of contaminants into Pine Creek. Also refer to the discussion in the Drainage section under Impact 4.2-5.

❑ **MITIGATION MEASURE 4.5-5A:** The project sponsor shall install oil/grease separators in the storm drain system for the parking lot and developed area to prevent the runoff of oil and grease into Pine Creek.

MONITORING

Mitigation Implementation:	*Project Sponsor*
Monitoring Requirement:	*Inspect location of oil/grease separators*
Responsibility for Monitoring:	*City Construction Division*
Timing:	*During construction*

❑ **MITIGATION MEASURE 4.5-5B:** The project sponsor shall prepare and implement a containment plan for the gas station site that will result in the prevention of runoff of any gas or gas station pollutants into Pine Creek.

MONITORING

Mitigation Implementation:	*Project Sponsor*
Monitoring Requirement:	*Inspect plans for gas station runoff containment and field check during construction*
Responsibility for Monitoring:	*City Construction Division*
Timing:	*Prior to issuance of building permits and during construction*

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4.6 HAZARDS

Setting

Hazards

Phase I and Phase II Environmental Site Assessments (ESAs) prepared for the project site by Kleinfelder, Inc., in May and October 1998 are summarized in this section.[1] The Phase I ESA described the land use history of the project site and area that may have involved the handling, storage, or disposal of hazardous substances that could have affected the quality of soils or groundwater, and evaluated the potential presence of chemically-affected soil on the project site. Preparation of the Phase II ESA entailed collecting soil and groundwater samples from various locations on the project site and evaluating them for the presence of hazardous materials. In response to a request by the San Francisco Bay Regional Water Quality Control Board, a subsequent groundwater sample was collected from the site in November 1998 and subjected to laboratory analysis. The results of the Phase I and Phase II investigations are discussed below.

Existing Conditions

Soils in the area are composed of the Brentwood–Rincon–Zamora association, which are well-drained clay loams and silty clay loams found on valley fill, alluvial fans, and low terraces. U.S. Soil Conservation Service maps of the area indicate that the project site is covered with Sycamore silty clay loam, which has slow runoff characteristics and little or no erosion hazard. Depth to groundwater at the site varies between 15 and 25 feet, with seasonal fluctuations, and flows in a northwesterly direction. Pine Creek, a concrete-lined channel, flows adjacent to the site's southwestern border.

The majority of the site is currently vacant and covered with dense weeds, with a limited amount of development located along Monument Boulevard. The Monument Boulevard frontage is occupied by two one-story buildings: a vacant building at 2390 Monument Boulevard and a building occupied by Monument Imports at 2400 Monument Boulevard. Several drop storage boxes are located in a fenced enclosure behind the vacant building. An open-sided shed on a concrete slab is also located behind this building. Two 55-gallon drums containing what appears to be motor oil are located in the open-sided shed. Several small sheds are attached to the Monument Imports building, which is surrounded by autos and recreational vehicles (RVs). Although the facility reportedly does not perform auto repairs, numerous automobile tires and batteries are located outside the shed on the southeast side of the main building. The building owner refused a request by Kleinfelder to conduct an interior inspection of the building.

There was no evidence of an underground storage tank (UST) on the site during any site reconnaissance conducted by Kleinfelder. However, the presence of many vehicles in the vicinity of the Monument Imports building precluded the visual identification of fill ports or other evidence of a UST. A water well with a pump and holding tank is located to the southeast of the Monument Imports sales building. Another water well may be located in a nearby shed that could have been used as a pump house; however, debris in the shed precluded verifying the presence of a well during the site reconnaissance. The Phase I ESA recommended that the on-site wells be destroyed in accordance with local guidelines, including grouting the boring with cement. Proper closure of this well is included as part of the proposed project.

Small piles of concrete rubble, household trash, metal and wood scraps, and furniture are dotted across the site. Several large mounds of soil on the site are likely the result of past on-site or nearby grading activities. Although several pole-mounted transformers are on the southeast border of the site, according to Pacific Gas & Electric (PG&E), they are unlikely to be contaminated with polychlorinated biphenyls (PCBs), a hazardous oil additive used in insulating fluid for electrical equipment manufactured prior to 1979. PG&E has tested transformers in the area and replaced those identified as containing PCBs.

An area adjacent to the concrete-lined Pine Creek channel has recently been disked. The remainder of the site is vacant and covered with dense weeds, which precluded the observation of any stained soil. However, in areas where soil is exposed, there is no evidence of odors, staining, or other signs of contamination.

Several properties adjacent to the project site are occupied by businesses that may store and/or handle hazardous substances. These include two gas stations (one across from the site on Monument Boulevard and one at the southeast corner of the Monument Boulevard/Detroit Avenue intersection), light industrial and commercial businesses located across Detroit Avenue from the site, and numerous commercial and light industrial businesses located in the Shary Industrial Park, immediately south of the project site.

Historical Use of the Site and Vicinity

Historical uses of the site were determined through a review of historical aerial photographs dating to 1952, topographic maps dating to 1893, County Assessor's records, files in the City of Concord's building and planning departments, and records maintained by Contra Costa County's Health Services Department and Fire Protection District. No Sanborn Fire Insurance Maps, a typical source of historical land use, were available for the site vicinity, most likely because the area's population density was too low for it to be considered a fire hazard zone. No individuals with knowledge of the history of the site were available for interviews, another frequent source of historical land use information.

Based on available information sources, the majority of the project site appears to have been vacant at least until 1952, with a portion of the site along the eastern border in agricultural production as tree orchards. The first development on the site appeared in a 1957 aerial photo; a structure on Monument Boulevard was surrounded by cars and trucks. From 1996 onward, the site appeared as it does today, with two buildings fronting on Monument Boulevard and numerous vehicles surrounding the buildings, while the remainder of the site remained vacant.

By 1952 the area west of the project site and on the north side of Monument Boulevard was developed with residential and commercial buildings. The northeast corner of Monument Boulevard and Detroit Avenue was apparently occupied by a farm house and orchards; the farm house remained in a 1957 photograph but was replaced by a gas station by 1969. An area southeast of Detroit Avenue occupied now and in 1969 by industrial/commercial buildings was vacant in the 1952 and 1957 aerial photographs. Buildings associated with the Shary Industrial Park appeared in the 1969 photo; prior to this, the area was vacant. The area to the southwest of

the project site was vacant in historical photographs through 1978. The condominiums currently in this location appeared in a 1988 photograph. Although Monument Boulevard was present in all of the historical photos reviewed, Detroit Avenue did not appear until the 1957 photo.

Fire Safety Notices on file at the Contra Costa County Fire Protection District (CCCFPD) provided information on previous uses of the 2390 Monument Boulevard address currently occupied by the vacant building. The site was occupied by Rolling Homes (RV sales) from 1974 until 1996 and by DNS Storage in 1997. A propane tank located on the site between 1971 and 1993 was operated by Rolling Homes to refill portable propane canisters for customers. Welding was performed in an on-site shop in 1974 and flammables were stored in the shop between 1972 and 1986. The building was used as a repair garage in 1986. A 1993 record of a phone message from the Twining Laboratories to Inspector Bridges of the CCCFPD (and accompanying map) indicated that the northwest portion of the site was affected by "hazardous spills." However, there are no records of violations associated with use or storage of hazardous materials, and no evidence that any USTs or above-ground storage tanks (ASTs) were located at 2390 Monument Boulevard or elsewhere on the project site. Records also indicate that 2390 Monument Boulevard was previously addressed 700 Monument Boulevard and that a golf driving range was associated with this address. However, as implied in the discussion above, the driving range did not appear in any of the historical photographs of the site.

Regulatory Database Search

Kleinfelder reviewed records in 18 federal, state, and local regulatory agency databases to identify potential environmental conditions that could adversely affect soil or groundwater quality at the project site or otherwise pose a potential health and safety threat at the site. The project site did not appear on any of the databases. However, the Phase I ESA identified 140 properties within a one and one-quarter-mile radius of the site that appear in one or more of the regulatory agency databases. Of the 140 properties, 112 are located within a three-eighths-mile radius of the site, and 39 of the properties are Leaking Underground Storage Tank (LUST) sites. Many of these properties are located down-gradient or cross-gradient of the groundwater flow at the project site, and therefore have low potential to impact the site. The majority of the remaining properties have either been granted case closure by the local regulatory agency, are located too far from the site to affect it, or are not known to have caused any releases of chemicals into the environment. Seven cases at separate sites were identified in the ESA that do have the potential to impact the site, most of them located in the Shary Industrial Park adjacent to the project site's southeast border. The sites and their approximate distances from the project site are listed in Table 4.6-1.

The sites listed in Table 4.6-1 appeared in one or more of five different regulatory databases. Several are on one of the Leaking Underground Storage Tank (LUST) lists maintained by the San Francisco Bay Regional Water Quality Control Board (RWQCB) and the California Environmental Protection Agency (Cal-EPA). Two sites are registered by the state as underground storage tanks. The Phase I ESA examined UST databases maintained by both the State Water Resources Control Board and the Alameda County Department of Environmental Health. The Cortese database referenced for four of the sites in Table 4.6-1 contains the potential and confirmed hazardous waste sites throughout California. This database is compiled from ten

different sources, including the Department of Toxic Substances Control (DTSC), State Water Resources Control Board, Air Resources Board, and the California Integrated Waste Management Board. The SCL database refers to the State-Equivalent CERCLIS List, a list of known and potential hazardous materials release sites maintained by DTSC. The RCRA Small Generator list is part of the U.S. Environmental Protection Agency's Resource Conservation and Recovery Act Program that identifies and tracts hazardous waste from the point of generation to the point of disposal. Small-quantity generators are facilities that generate less than 1,000 kilograms per month of non-acutely hazardous waste.

Table 4.6-1
Open Cases of Nearby Hazardous Materials Releases

Facility Name and Address	Approximate Distance and Direction from Project Site	Identifying Database(s)[1]
Taylor Made Office Systems 1035 Detroit Avenue	adjacent to east	LUST, UST
Martin Development Company 1061 Shary Circle	adjacent to southeast	LUST
Laura Scudder Distribution 1044 Shary Circle	adjacent to southeast	Cortese
Ultratek 1041 Shary Circle	adjacent to southeast	Cortese, LUST
Ultratek 1014 Shary Circle	250 feet southeast	Cortese
Facility 11455 2745 B Cloverdale Avenue	250 feet east	Cortese
Marvac Scientific Mnfg. Co. 2931 Cloverdale Avenue	450 feet east	SCL, RCRA Small Generator, UST

[1] Refer to text for discussion of databases.

Soil and Groundwater Testing

Based on the historical uses on the project site and the presence of nearby sources of chemical contamination with the potential to affect the site, the Phase I report recommended additional soil and groundwater testing, which was conducted by Kleinfelder in October 1998. A total of 14 borings were drilled on the site for the extraction of groundwater samples. Three borings were made along the site perimeter adjacent to the Shary Industrial Park, while the majority were made near the north end of the site, in the vicinity of the existing on-site buildings and the adjacent Arco

gas station. Surface soil samples were collected from nine locations distributed throughout the site. Subsurface soil samples were also collected from all but four of the boring locations.

The collected surface soil samples were composited into three samples and laboratory analyzed for volatile organic compounds (VOCs); total petroleum hydrocarbons (TPH) as gasoline (TPH-g), as diesel (TPH-d), and as motor oil (TPH-mo); aromatic hydrocarbons (benzene, toluene, ethylbenzene, and total xylenes [BTEX]); methyl tertiary-butyl ether (MTBE); Title 22 metals; polychlorinated biphenyls (PCBs); and organochlorine pesticides using appropriate testing methods approved by the United States Environmental Protection Agency (EPA). No concentrations of TPH-g, BTEX, MTBE, VOCs, PCBs, or pesticides were detected above the laboratory reporting limits in any of the samples. TPH-d was detected in the samples at concentrations of 3.2, 2.6, and 3.7 milligrams per kilogram (mg/kg), respectively, well below the range of thresholds (100 to 10,000 mg/kg, determined on a case-by-case basis) requiring remediation in vadose zone soils, according to the Leaking Underground Fuel Tank (LUFT Field Manual published by the State of California. Although various Title 22 metals were detected in the three composite soil samples, the concentrations were all below the applicable Total Threshold Limit Concentration (TTLC), Preliminary Remediation Goal (PRG), and Soluble Threshold Limit Concentration (STLC), with the exception of arsenic. Arsenic concentrations in the three samples were 28, 41, and 46 mg/kg, respectively, well below the TTLC of 500 mg/kg but considerably over the STLC of 5 mg/kg, the PRG for residential soils of 0.38 mg/kg, and the PRG for industrial soils of 3.0 mg/kg. However, typical background concentrations for arsenic in the Bay Area are 6.5 to 65 mg/kg. Kleinfelder concluded that the concentrations found on the project site were indicative of natural background conditions.

Subsurface soil samples were collected at 5-foot intervals down to the groundwater table. A total of 13 samples were laboratory analyzed for TPH, BTEX, MTBE, and VOCs using approved EPA methods. No VOCs or MTBE were detected in any of the samples. Although detectable concentrations of TPH-g (27 mg/kg), TPH-d (14 mg/kg), toluene (0.12 mg/kg), ethylbenzene (0.087 mg/kg), and total xylenes (0.14 mg/kg) were present in a sample collected from adjacent to the vacant building on the site at a depth of 16 feet, the concentrations were all well below levels that would require remediation. In addition, arsenic was detected in this and one other subsurface soil sample at concentrations of 32 and 31 mg/kg, respectively. As with the surface soils, Kleinfelder concluded that these concentrations appear to be natural background levels.

The 14 groundwater samples collected from the project site were analyzed for TPH-g, BTEX, MTBE, and VOCs using approved EPA methods. Ten of the samples were also analyzed for TPH-d and TPH-mo and two of the samples were evaluated for the presence of Title 22 metals. Although various metals were detected, they were all present in concentrations below their respective Maximum Contaminant Levels (MCLs). No MTBE was detected in any of the samples. Toluene, ethylbenzene, and total xylenes were detected in concentrations up to 86, 160, and 150 micrograms per liter (μg/L), respectively, all below the respective MCLs of 150, 700, and 1,750 μg/L. However, a number of contaminants were found that exceeded their regulatory limits. These included the following:

- TPH-g was detected above reporting limits in four samples at concentrations ranging from 6,100 to 24,000 μg/L. Although remediation levels are established by the San Francisco Bay Regional Water Quality Control Board (RWQCB) on a case-by-case basis, these levels are likely to require some type of remediation.
- TPH-d was detected above reporting limits in eight samples at concentrations ranging from 57 to 51,000 μg/L. These levels are also likely to require remediation by the RWQCB.
- TPH-mo was detected above reporting limits in six samples at concentrations ranging from 270 to 1,000 μg/L. These levels are also likely to require remediation by the RWQCB.
- Benzene was detected above reporting limits in two samples at concentrations of 5.7 and 49 μg/L, respectively. These are both above the MCL of 1 μg/L.
- Several VOCs were present in concentrations above their MCL, including 1,2-dichloroethane (1,2-DCA), 1,1-dichloroethene (1,1-DCE), tetrachloroethene (PCE), and trichloroethene (TCE).

Based on Kleinfelder's analysis of contaminant levels found on the site, direction of groundwater flow, known present and historical use of the project site and adjacent sites, and other relevant factors, Kleinfelder concluded that TPH and VOC contaminants encountered on the site were from off-site sources, including the adjacent Arco gas station.

In accordance with recommendations presented in the Phase II ESA, Costco consulted with representatives from the RWQCB, who reviewed the ESA documentation and subsequently requested additional information and collection of a water sample from the inactive onsite water well. A sample was collected on November 24, 1998, and submitted for laboratory analysis, which revealed no detectable TPH and low levels of VOCs. In a follow-up report submitted to the RWQCB, Kleinfelder provided the results of the well water sample analysis, along with a transmissive zone schematic, and the results of a survey of sensitive receptors within a 2,000-foot radius of the project site. The follow-up report concluded that it is unlikely that any surface water bodies and/or water supply wells in the vicinity of the site would be affected by migration of the existing subsurface contaminants, due to their construction (lined channels), relative position (upgradient or cross-gradient), and/or distance from the site.

In response to the investigation conducted by Kleinfelder, the RWQCB issued a letter on December 14, 1998 concurring that the groundwater pollution at the site is likely a result of migration of contaminants from an upgradient source, and the owners of the project site would not be responsible for cleanup. However, the owner would be responsible for providing reasonable access to the site for investigation or cleanup by other responsible parties. It is anticipated that the access that might be required for testing and cleanup would consist of establishing one or more monitoring/extraction wells on the Costco site in the area of the proposed parking lot. As part of the project, Costco is prepared to provide this access as required.

Regulatory Context

Gasoline Filling Station

Federal regulations under the Resource Conservation and Recovery Act of 1976 (RCRA) govern the installation and operation of underground storage tanks (USTs) of at least 110 gallons which are used to store gasoline or other petroleum products.[2] Within California, a complex and detailed regulatory structure governs UST installation, monitoring, and use; many of the state requirements mirror the federal requirements. Although the U.S. Environmental Protection Agency (EPA) has not officially designated any state agency to administer the federal regulations in California, it is generally recognized that compliance with the strict state requirements signifies compliance with the federal regulations.[3] The California Environmental Protection Agency (Cal/EPA) has broad authority in California for overseeing implementation of the state regulations pertaining to USTs. However, the regulations described below were promulgated by the State Water Resources Control Board (SWRCB) and are primarily administered at the local level.

In 1993 the California Legislature required the Secretary of the California Environmental Protection Agency (Cal/EPA) to establish a Unified Hazardous Waste and Hazardous Materials Management Regulatory Program (Unified Program) (SB 1082, Calderon). The Unified Program established by the Secretary consolidated and coordinated six state programs managing hazardous waste and hazardous materials use and storage. The following programs were consolidated:

- Hazardous Waste Generator and Hazardous Waste On-site Treatment
- Aboveground Storage Tanks (Spill Prevention Control and Countermeasure Plan only)
- Underground Storage Tanks
- Hazardous Material Release Response Plans and Inventories
- Risk Management and Prevention Program (RMPP), replaced by the California Accidental Release Program (Cal/ARP)
- Uniform Fire Code Hazardous Material Management Plans and Inventories

The Unified Program is to be implemented in a consistent and coordinated manner throughout each county. To this end, the Secretary of Cal/EPA was required to designate a Certified Unified Program Agency (CUPA) for the administration of the Unified Program within each county. In developing a local Unified Program, a CUPA must establish systems that consolidate the administrative and permitting requirements of the six program elements, unify the inspection and enforcement activities of the six programs, and consolidate hazardous waste and hazardous materials fees into a single fee. On January 1, 1997, the Secretary designated the Hazardous Materials Programs, a division of the Health Services Department, to be the CUPA for Contra Costa County. The Contra Costa CUPA has responsibility for permitting the underground storage tanks that would be located at the proposed Costco gas station.

The three proposed underground storage tanks (USTs) would require permitting under California Health and Safety Code Section 25280 *et seq*. Prior to issuing a Unified Program Facility Permit

for the tanks, the CUPA must ensure that the tanks are designed and constructed to provide primary and secondary containment of the stored hazardous substance. A double-walled container may be used to meet the requirements for secondary containment if the outer shell is constructed of fiberglass-reinforced plastic, cathodically protected steel, or steel clad with fiberglass-reinforced plastic which provides structural support and a continuous leak detection system in the space between the shells. The leak detection system must be capable of detecting a leak of the hazardous substance through the primary shell or intrusion of water through the outer shell, and must include an alarm. All piping associated with the USTs must also have secondary containment. The tank, containment system, and all accessories, fittings, coatings or linings, monitoring systems, and level controls used to form the underground storage tank system must be approved by an independent testing organization in accordance with established industry standards. Prior to being placed in service, the tanks must be tested in operating condition using a tank integrity test in accordance with standards established by the SWRCB. The owner or operator of the USTs is required to maintain evidence of financial responsibility for taking corrective action and compensating third parties for bodily injury and property damage caused by a release from the underground tank system. The tank will be subject to inspection by the Contra Costa CUPA at least every three years. As discussed below, a permit must be obtained from the Contra Costa County Fire Protection District for tank installation.

Storage and Sales of Hazardous Materials

Many of the containerized cleaning agents, automotive fluids, and other products that would be sold at the proposed Costco store would be considered hazardous materials, as would the photochemicals used in the proposed photo lab. No Extremely Hazardous Substances, as defined in the Code of Federal Regulations (CFR),[4] would be used or sold at the site. No regulated toxic and flammable substances as defined in the CFR[5] would be used or sold, with the exception of propane, which would be sold in quantities well below the threshold quantity (10,000 pounds) that would require preparation of a Risk Management Plan under the federal Clean Air Act.

Due to the wholesale quantities that would be stored and sold on the site, the project sponsor would be required to prepare a Hazardous Materials Management Plan, also known as a Business Plan, under the California Hazardous Materials Release Response Plans and Inventory (Business Plan) Program.[6] As discussed above, this program is administered locally by the Contra Costa CUPA. The purpose of the Business Plan program is to provide basic information on the location, type, quantity, and health risks of hazardous materials handled, used, stored, or disposed of which could be accidentally released into the environment. The information is to be made available to firefighters, health officials, planners, public safety officers, health care providers, regulatory agencies, and other interested persons.

The Business Plan is required to provide detailed information on each hazardous material that is handled on the site. Although this information is generally required only for materials that exceed threshold quantities of 500 pounds for solids, 55 gallons for liquids, or 200 standard cubic feet for gases,[7] the CUPA may require it for other materials in response to public health, safety, or environmental concerns.[8] The information required includes the common name, chemical name, Uniform Fire Code hazard class, the physical state, hazard categories, container size, maximum

daily amount, and more. The Business Plan is also required to include site layout and facility diagrams and an Emergency Response and Evacuation Plan/Employee Training Program. At a minimum, the Emergency Response and Evacuation Plan must include alarm and notification procedures, evacuation routes and procedures, description and location of emergency equipment, emergency response procedures, and a list of emergency contact personnel. Required training includes safety and emergency response training for all employees.

The project would also be subject to review and approval by the Contra Costa County Fire Protection District (CCCFPD). A variety of specialized Uniform Fire Code provisions would apply to the proposed project. Permits would be required for installation of the USTs (the County permit pertains to operation of the tanks), installation and operation of the gasoline dispensers and associated valves and piping, high-piled storage of combustible materials, storage and handling of flammable liquids, storage and handling of aerosol products, and tire storage. Each permit would require separate application and would be subject to specific requirements and inspection by CCCFPD. For example, the permit for high-piled combustible storage would require detailed information on the location and type of storage, including structural columns, number of rack tiers, type of shelving, type of barriers, and flue space; commodity storage, including type of commodity, type of packaging, encapsulation, container type, maximum storage height, and sprinkler head clearance; fire suppression sprinkler design and rating; type and locations of fire alarms; and more. The permit requirements would dictate an approved automatic fire extinguishing system, smoke and heat vents, draft "curtain" boards, aisle width, and more. Each permit would be subject to similar documentation and design requirements.

The Fire Protection District would also review project plans to ensure the project's conformance with general Uniform Fire Code and Uniform Building Code provisions pertaining to building construction, fire suppression equipment, etc. On-site fire hydrants would be required within 100 feet of all new construction. A 20-foot-wide emergency access drive around the building and adequate maneuvering room for fire trucks on the site would be required. The building would be required to be fully sprinklered and the project would be subject to water supply and minimum fire flow requirements.

The responding fire station assigned to the project site would be CCCFPD's Station No. 6, located at Grant and Willow Pass roads. The Fire Protection District may require installation of Opticom emitters and pick-ups on traffic signals along the route between Station No. 6 and the project site as a condition of project approval.[9] The Opticom system enables the sirens on the fire trucks to turn the signals green, minimizing the District's response time to the site.

City of Concord General Plan Policies

The following Concord General Plan goals, objectives, and policies pertaining to health and safety issues are relevant to the proposed project:

> ***Objective 2.2: Fire Protection.*** Minimize threats to life and property from potential fire hazards by ensuring the provision of high quality and comprehensive fire protection and emergency services.

Policy 2.2.1. Coordinate plans and activities with the Contra Costa County Fire Protection District (CCCFPD).

Policy 2.2.2. New development shall have water systems which meet CCCFPD fire flow requirements or shall provide adequate on-site water storage.

Policy 2.2.3. Ensure that sufficient access for fire protection services is available.

GOAL 5: Hazardous Materials Risk Reduction. Protect the public from hazard associated with the use, transport, treatment, and disposal of hazardous substances.

Objective 5.1: Agency Coordination. Coordinate with county, state, and federal agencies that regulate the handling of hazardous substances.

Policy 5.1.1. Whenever a land use which includes handling potentially hazardous materials is proposed proximate to water canals, pipelines, or reservoirs, the City shall coordinate review of the proposal with the appropriate water provider agency.

Policy 5.1.2. Coordinate review of proposals for sites which may have toxic contamination or for [*sic*] use of hazardous materials with the Contra Costa County Department of Environmental Health, Hazardous Materials Division, and other appropriate regulatory agencies as part of the review process.

Policy 5.1.3. As part of development or land use review, address toxic contamination.

GOAL 6: Reduction of Fire Hazard. Protect the public from hazard associated with fire.

Objective 6.1: Fire-safe construction. Incorporate all applicable requirements for fire safety into all new structures.

Impacts and Mitigation Measures

Significance Criteria

Appendix G of the *CEQA Guidelines* identifies a number of significant environmental impacts related to hazards and hazardous materials, including:

- creation of a hazard for people working or living within the planning area of an airport with an airport land use plan, within two miles of a public use airport without an airport land use plan, or in the vicinity of a private airstrip;
- interference with an adopted emergency response plan or emergency evacuation plan; or
- exposure of people or structures to a significant risk of loss, injury, or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands.[10]

These standards of significance are adopted for use in this EIR. In addition, the creation of a significant hazard to the public health and safety of any nature or any substantial increase in an existing hazard would be considered a significant adverse impact. Violation of federal, state, or local laws or regulations pertaining to public health and safety would also be deemed a significant impact.

Construction-related Impacts

Although there is a slight potential for construction workers to be exposed to groundwater contaminated with TPH and VOCs, as stated above, a Risk Management Plan (RMP) would be prepared prior to project construction that would detail procedures to be followed in such an eventuality. These procedures would limit exposure and protect construction worker health and safety. Accordingly, there would be no adverse impact to public health and safety during project construction.

Project Impacts

IMPACT 4.6-1: Operation of the completed Costco store would involve the handling, storage, and sales of a variety of containerized liquids that would be considered hazardous substances. This is considered a *less-than-significant* impact.

Hazardous substances would include **aerosols** (hair mousse, bathroom cleaner, engine cleaner, lubricant, other cleaners, furniture polish), **corrosives** (batteries, toilet bowl cleaner, film developer, disinfectant, floor cleaner, other cleaners), **combustible liquids** (motor oil, fuel additive, fabric softener, glass cleaner, bathroom cleaner, disinfectant, wax stripper), **flammable gases** (propane), **flammable liquids** (gasoline, disinfectant, wax stripper), **irritants** (anti-static film cleaner, dishwasher detergent, laundry detergent, dry bleach, various other cleaners, photo chemicals, freon), and **oxidizers** (liquid bleach, tile cleaner).

The project would include construction of a gasoline station, including three underground storage tanks, the largest of which would have a capacity of 20,000 gallons.

Although the proposed gasoline station and on-site storage of hazardous materials would create a potential for fire, explosion, or the release of hazardous materials into the environment, the detailed regulatory requirements pertaining to the project, briefly summarized in the Setting section above, would reduce such threats to a minimum. The proposed facility would be typical of urban development operating safely throughout the United States and would not pose an undue threat to public health and safety.

❑ **MITIGATION MEASURE 4.6-1:** None is required.

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[1] Kleinfelder, Inc., *Phase I Environmental Site Assessment Report, Monument Boulevard Property, Concord, California*, May 28, 1998; and Kleinfelder, Inc., *Limited Soil and Groundwater Sampling Report, Monument Boulevard Property, Concord, California*, October 13, 1998.

[2] 40 CFR, Part 280 *et seq.*

[3] Shahla Farahnak, Associate Engineer, State Water Resources Control Board, personal communication, May 19, 1999.

[4] 40 CFR 355.20.

[5] 40 CFR 68.130.

[6] California Health and Safety Code, Section 25500 *et seq.*

[7] In Contra Costa County, the reporting threshold for inert gases used in HVAC systems is 6,000 standard cubic feet.

[8] California Health and Safety Code, Section 25503.5(c)(1).

[9] Kevin Mulcahy, Plans Examiner, Contra Costa County Fire Protection District, personal communication, May 20, 1999.

[10] Governor's Office of Planning and Research, *CEQA Guidelines*, Appendix G, Section XIII, revised October 26, 1998.

4.7 NOISE

Setting

Fundamental Concepts of Environmental Acoustics

Noise may be defined as unwanted sound and is usually objectionable because it is disturbing or annoying. The objectionable nature of sound could be caused by its *pitch* or its loudness. *Pitch* is the height or depth of a tone or sound, depending on the relative rapidity (frequency) of the vibrations by which it is produced. Higher pitched signals sound louder to humans than sounds with a lower pitch. *Loudness* is intensity of sound waves combined with the reception characteristics of the ear. Intensity may be compared with the height of an ocean wave in that it is a measure of the amplitude of the sound wave.

In addition to the concepts of pitch and loudness, there are several noise measurement scales which are used to describe noise in a particular location. A *decibel (dB)* is a unit of measurement which indicates the relative amplitude of a sound. The zero on the decibel scale is based on the lowest sound level that the healthy, unimpaired human ear can detect. Sound levels in decibels are calculated on a logarithmic basis. An increase of 10 decibels represents a ten-fold increase in acoustic energy, while 20 decibels is 100 times more intense. There is a relationship between the subjective noisiness or loudness of a sound and its intensity. Each 10 decibel increase in sound level is perceived as approximately a doubling of loudness over a fairly wide range of intensities. Technical terms are defined in Table 4.7-1.

There are several methods of characterizing sound. The most common in California is the *A-weighted sound level* or *dBA*. This scale gives greater weight to the frequencies of sound to which the human ear is most sensitive. Representative outdoor and indoor noise levels in units of dBA are shown in Table 4.7-2. Because sound levels can vary markedly over a short period of time, a method for describing either the average character of the sound or the statistical behavior of the variations must be utilized. Most commonly, environmental sounds are described in terms of an average level that has the same acoustical energy as the summation of all the time-varying events. This energy-equivalent sound/noise descriptor is called L_{eq}. The most common averaging period is hourly, but L_{eq} can describe any series of noise events of arbitrary duration.

Since the sensitivity to noise increases during the evening and at night—because excessive noise interferes with the ability to sleep—24-hour descriptors have been developed that incorporate artificial noise penalties added to quiet-time noise events. The *Community Noise Equivalent Level, CNEL*, is a measure of the cumulative noise exposure in a community, with a 5 dB penalty added to evening (7:00 p.m. to 10:00 p.m.) and a 10 dB addition to nocturnal (10:00 p.m. to 7:00 a.m.) noise levels. The *Day/Night Average Sound Level,* L_{dn}, is essentially the same as CNEL, with the exception that the evening time period is dropped and all occurrences during this three-hour period are grouped into the daytime period.

Table 4.7-1
Definitions of Acoustical Terms

TERM	DEFINITIONS
Decibel, dB	A unit describing the amplitude of sound, equal to 20 times the logarithm to the base 10 of the ratio of the pressure of the sound measured to the reference pressure, which is 20 micropascals (20 micronewtons per square meter).
Frequency, Hz	The number of complete pressure fluctuations per second above and below atmospheric pressure.
A-Weighted Sound Level, dBA	The sound pressure level in decibels as measured on a sound level meter using the A-weighting filter network. The A-weighting filter de-emphasizes the very low and very high frequency components of the sound in a manner similar to the frequency response of the human ear and correlates well with subjective reactions to noise. All sound levels in this report are A-weighted, unless reported otherwise.
L_{01}, L_{10}, L_{50}, L_{90}	The A-weighted noise levels that are exceeded 1%, 10%, 50%, and 90% of the time during the measurement period.
Equivalent Noise Level, L_{eq}	The average A-weighted noise level during the measurement period.
Community Noise Equivalent Level, CNEL	The average A-weighted noise level during a 24-hour day, obtained after addition of 5 decibels in the evening from 7:00 p.m. to 10:00 p.m. and after addition of 10 decibels to sound levels measured in the night between 10:00 p.m. and 7:00 a.m..
Day/Night Noise Level, L_{dn}	The average A-weighted noise level during a 24-hour day, obtained after addition of 10 decibels to levels measured in the night between 10:00 p.m. and 7:00 a.m..
L_{max}, L_{min}	The maximum and minimum A-weighted noise level during the measurement period.
Ambient Noise Level	The composite of noise from all sources near and far. The normal or existing level of environmental noise at a given location.
Intrusive	That noise which intrudes over and above the existing ambient noise at a given location. The relative intrusiveness of a sound depends upon its amplitude, duration, frequency, and time of occurrence and tonal or informational content as well as the prevailing ambient noise level.

Source: Illingworth & Rodkin, Inc./Acoustical Engineers

Table 4.7-2
Typical Sound Levels Measured in The Environment and Industry

At a Given Distance From Noise Source	A-Weighted Sound Level in Decibels	Noise Environments	Subjective Impression
	140		
Civil Defense Siren (100')	130		
Jet Takeoff (200')	120		Pain Threshold
	110	Rock Music Concert	
Diesel Pile Driver (100')	100		Very Loud
	90	Boiler Room Printing Press Plant	
Freight Cars (50') Pneumatic Drill (50') Freeway (100')	80		
Vacuum Cleaner (10')	70	In Kitchen With Garbage Disposal Running	Moderately Loud
	60	Data Processing Center	
Light Traffic (100') Large Transformer (200')	50	Department Store	
	40	Private Business Office	Quiet
Soft Whisper (5')	30	Quiet Bedroom	
	20	Recording Studio	
	10		Threshold of Hearing
	0		

Source: Illingworth & Rodkin, Inc./Acoustical Engineers

Effects of Noise

Hearing Loss

The Occupational Safety and Health Administration (OSHA) has a noise exposure standard which is set at the noise threshold where hearing loss may occur from long-term exposures. The allowable level is 85 dBA averaged over eight hours. If the noise is above 85 dBA, the allowable exposure time is correspondingly shorter.

Sleep and Speech Interference

The thresholds for speech interference indoors are about 45 dBA if the noise is steady and above 55 dBA if the noise is fluctuating. Outdoors the thresholds are about 15 dBA higher. Steady noise of sufficient intensity (above 35 dBA) and fluctuating noise levels above about 45 dBA have been shown to affect sleep. Interior residential standards for multi-family dwellings are set by the State of California at 45 dBA L_{dn}. Typically, the highest steady traffic noise level during the daytime is about equal to the L_{dn} and nighttime levels are 10 dBA lower. The standard is designed for sleep and speech protection and most jurisdictions apply the same criterion for all residential uses. Typical structural attenuation is 12 to 17 dBA with open windows. With closed windows in good condition, the noise attenuation factor is around 20 dBA for an older structure and 25 dBA for a newer dwelling. Sleep and speech interference is therefore possible when exterior noise levels are about 57 to 62 dBA L_{dn} with open windows and 65 to 70 dBA L_{dn} if the windows are closed. Levels of 55 to 60 dBA are common along collector streets and secondary arterials, while 65 to 70 dBA is a typical value for a primary/major arterial.

Annoyance

Attitude surveys are used for measuring the annoyance felt in a community for noises intruding into homes or affecting outdoor activity areas. In these surveys, it was determined that the causes for annoyance include interference with speech, radio and television, house vibrations, and interference with sleep and rest. The L_{dn} as a measure of noise has been found to provide a valid correlation of noise level and the percentage of people annoyed. People have been asked to judge the annoyance caused by aircraft noise and ground transportation noise. There continues to be disagreement about the relative annoyance of this different source. When measuring the percentage of the population highly annoyed, the threshold for ground vehicle noise is about 55 dBA L_{dn}, and as the decibel levels increase, the percentage of population becoming annoyed increases as well.

Regulatory Background

The State of California and the City of Concord have established plans and policies which are designed to limit noise exposure at noise sensitive land uses. These plans and policies include: (1) the State CEQA Guideline, Appendix G, and (2) the City of Concord Noise Element of the General Plan.

City of Concord Noise Element of the General Plan

The Noise Element sets forth criteria to determine noise and land use compatibility for residential, commercial, and industrial land uses. There are three categories in determining noise and land use compatibility. "Normally Acceptable" noise levels are acceptable assuming that buildings are of

normal conventional construction. "Conditionally Acceptable" noise levels require a detailed analysis of the noise reduction requirements and needed noise insulation features included in the design. "Unacceptable" noise levels are so severe that new construction or development should generally not be undertaken because mitigation is usually not feasible to comply with noise element policies.

The proposed Costco Wholesale project site would be located primarily adjacent to non-noise sensitive land uses (i.e., commercial and industrial land uses). There are, however, multi-family residential apartments located to the southwest of the project site. Residential land uses are "normally acceptable" up to 60 dB L_{dn}, "conditionally acceptable" up to 75 dB L_{dn}, and "unacceptable" above 75 dB L_{dn}. Commercial land uses are "normally acceptable" up to 60 dB L_{dn}, "conditionally acceptable" up to 80 dB L_{dn}, and "unacceptable" above 80 dB L_{dn}. Industrial land uses are "normally acceptable" up to 70 dB L_{dn}, and "conditionally acceptable" above 70 dB.

The City of Concord's Noise Element also establishes goals and policies to protect citizens from excessive exposure to noise. Applicable goals and policies for this project are described below.

> **GOAL 2: Noise Environment.** Achieve a noise environment that is compatible with human activities and health.
>
> ***Objective 2.1: Land Use Compatibility.*** Ensure that new development is compatible with the existing and future noise environment.
>
> > **Policy 2.1.1** Projects subject to discretionary approval will be reviewed to ensure that they are compatible with the noise environment. Review may require an acoustical study addressing both loudness and quality of noise. The City recognizes that some noise can be intrusive due to qualities other than loudness or duration, and that the public should be protected from unreasonable adverse impacts.
> >
> > **Policy 2.1.2** An acoustical report will be required for any project which would be exposed to noise levels in excess of those shown as "normally acceptable" in Table 1 (Land Use Compatibility for Community Noise Environments).
> >
> > **Policy 2.1.5** Where residential or other noise-sensitive land uses are proposed to be exposed to stationary noise sources, noise levels in the outdoor use areas of these residential or other noise-sensitive uses shall not exceed the limits set forth in Table 2 (Maximum Allowable Noise Exposure, Stationary Noise Sources).
>
> ***Objective 2.2: New Noise Sources.*** Prevent new noise sources from increasing noise levels above acceptable standards.

Policy 2.2.1 All potential noise generating projects will be reviewed to evaluate their impact on the noise environment of existing development.

Policy 2.2.3 The City shall evaluate the need for mitigation measures for any project whose non-transportation noise source would generate noise levels in excess of those allowed by Table 2 (Maximum Allowable Noise Exposure, Stationary Noise Sources).

City of Concord Noise Element

Table 2: Maximum Allowable Noise Exposure, Stationary Noise Sources

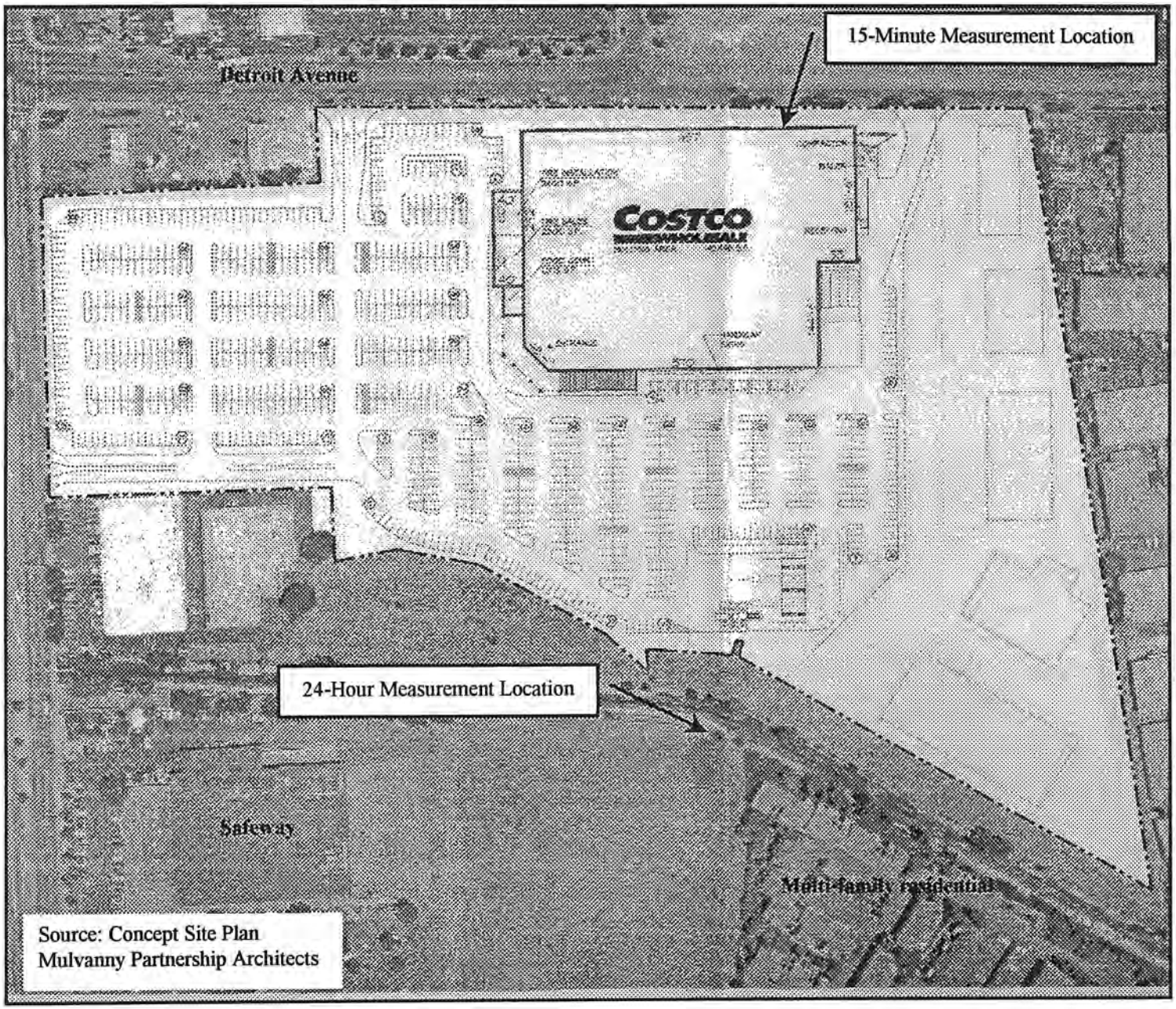
	Daytime (7 a.m. - 10 p.m.)	**Nighttime** (10 p.m. - 7 a.m.)
Hourly L_{eq}, dB	50	45
Maximum Level, dB	70	65
Maximum Level, dB - Impulsive Noise	65	60

Existing Noise Environment

The nearest noise sensitive receptors to the project are residents located along the southwestern edge of the project site. Residents are also located along Detroit Avenue north of Monument Boulevard. The project site's noise environment is characterized as a typically quiet area, yet distant traffic and commercially produced noise sources contribute to the overall ambient noise level.

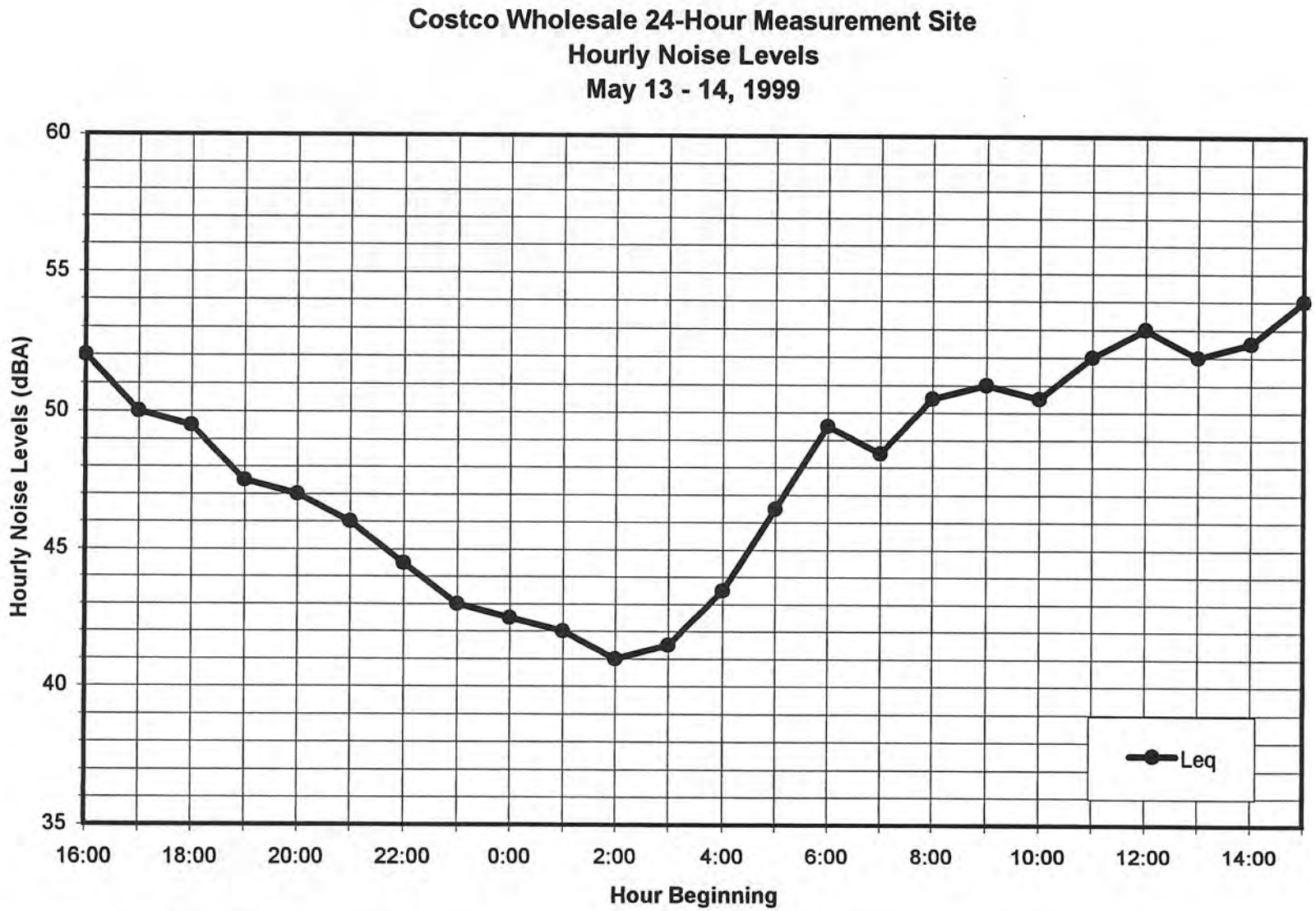
One long-term noise measurement (24-hour duration) and one short-term noise measurement (15-minute duration) were conducted adjacent to the project site (Figure 4.7-1). The long-term measurement was located approximately 60 feet north of the nearest apartment to the proposed project site. At this location, the measured L_{dn} during the 24-hour period was 53 dBA. The dominant noise source at this location was distant traffic. The data are summarized in Figure 4.7-2.

The short-term noise measurement was located approximately 75 feet southwest of the centerline of Detroit Avenue. At this location, noise levels were predominantly the result of traffic along Detroit Avenue. The average noise level over a fifteen-minute period (L_{eq}) at this location was 60 dBA.



Source: Illingworth & Rodkin, Inc.

Figure 4.7-1 Noise Measurement Locations



Source: Illingworth & Rodkin, Inc.

Figure 4.7-2 Hourly Noise Levels

Impacts and Mitigation Measures

Significance Criteria

According to CEQA, a significant noise impact would result if noise levels increase substantially at noise-sensitive land uses (e.g., residences) or if the project generated maximum noise levels from stationary noise sources are above General Plan Policies (i.e., above 70 dBA at the property line). A substantial increase to noise levels would occur if the project resulted in an increase of 3 dBA or greater at noise-sensitive land uses where noise levels already exceed 60 dBA L_{dn}, or an increase in noise levels of 5 dBA or greater where future noise levels would remain below 60 dBA L_{dn}. Construction noise levels would be treated somewhat differently because they are temporary. Significant noise impacts would result from construction if noise levels are sufficiently high enough to interfere with speech, sleep, or normal residential activities. Construction hourly noise levels received at noise-sensitive land uses above 60 dBA during the daytime and 55 dBA at night would be considered significant.

Project Impacts

IMPACT 4.7-1: Noise levels on the project site would be "conditionally acceptable" for the proposed project. This is a *less-than-significant* impact.

Noise levels on the project site would be less than 65 dBA L_{dn}. Under the General Plan, this is considered "conditionally acceptable" for commercial land uses. The greatest noise exposure on the project site would result primarily from noise generated by traffic along Detroit Avenue. The site plan proposes that the rear of the store will be located adjacent to Detroit Avenue. Noise levels generated by traffic along Monument Boulevard would not be a significant noise source for the proposed building because it will be located approximately 600 feet from the centerline of Monument Boulevard. At this distance, noise generated by traffic along Monument Boulevard will not cause noise levels to be excessive at the proposed building. Non-noise sensitive land uses (parking) are proposed adjacent to the roadway.

❑ **MITIGATION MEASURE 4.7-1:** None is required.

IMPACT 4.7-2: The majority of non-transportation (stationary) noise sources generated by the proposed project would be compatible with surrounding land uses including noise-sensitive receptors (multi-family apartments) to the southwest. However, noise levels generated by parking lot maintenance activities could exceed established noise standards. This is a *potentially significant* impact.

The proposed project is bordered by commercial land uses to the northwest and industrial land uses to the northeast, east, and south. These land uses would not be affected by noise generated by the proposed project. To the southwest, the nearest noise-sensitive receptors would be located

approximately 180 feet from the proposed project's gas station and over 700 feet from the proposed loading dock area.

Two short-term noise measurements were conducted at an existing Costco Wholesale Warehouse in Santa Rosa, California. These measurements were conducted to quantify noise levels produced by the warehouse loading dock area and the gas station. The short-term noise measurement of loading dock activity was conducted approximately 150 feet from the acoustic center of activity. Noise sources at this location included 5 diesel trucks and trailers, and the banging of pallet jacks associated with the unloading of freight from the trailers. The trucks back into gasketed loading bays which essentially makes the truck an extension of the warehouse. Noise levels generated by trucks ranged from 57 dBA to 70 dBA as they maneuvered through the loading dock area. A maximum noise level of 73 dBA was generated by an air brake release. As trucks were being unloaded, noise generated by pallet jacks ranged from 57 dBA to 59 dBA. The average noise level during the short-term measurement period was 56 dBA.

The short-term noise measurement of the gas station was conducted approximately 75 feet from the nearest pump, near the exit of the station. The station is oriented to control the flow of traffic in one direction. Noise generated by the gas station included traffic exiting the station, engine start-ups, and door slams. Traffic exiting the station generated noise levels ranging from 61 dBA to 68 dBA, measured at approximately 20 feet. During the 15-minute measurement, 53 vehicles exited the station. The loudest engine start-ups produced noise levels between 56 dBA and 60 dBA. Door slams were as high as 68 dBA. Vehicular traffic on Santa Rosa Avenue controlled the overall noise level.

Major noise sources in the parking lot would include the sounds of moving vehicles, the starting of engines, door slams, and human voices. The proposed parking areas of the residual property would be located approximately 150 feet from the nearest residential receptors. The sound of a passing car at 15 mph typically ranges from 40 to 50 dBA at 150 feet. The noise of an engine start is similar. Door slams typically produce noise levels lower than engine starts. The hourly average noise level resulting from all of these noise generating activities in a busy shopping center parking lot would be less than 45 dBA at the nearest noise-sensitive receptors. Sounds would occasionally be heard resulting from parking lot activity during project operational hours, but noise levels would not be substantially above existing ambient levels.

Typically, the parking area surface at similar shopping centers is periodically cleaned using small mechanical parking lot sweepers and hand-held, back-mounted leaf blowers. The noise from this type of equipment was measured by Illingworth & Rodkin, Inc. for a 1988 noise study conducted for the City of Pleasanton in response to complaints from nearby neighbors of a similar community shopping center. It was determined that at a distance of 50 feet, the noise of the mechanical parking lot sweeper was about 70 to 75 dBA. Leaf blower noise from four different tested types ranged from 70 to 80 dBA at a distance of 50 feet. Such equipment would probably be operated on the project site at distances as close as 150 feet from the nearest residential receptor. At this distance, noise levels produced by leaf blowers would be approximately 60 to 70 dBA.

Noise levels produced by stationary noise sources, with the exception of parking lot maintenance equipment and mechanical equipment on the nearest buildings of the residual property, would conform with the City of Concord limits. Noise levels would not significantly increase existing ambient noise levels at noise-sensitive land uses. The distance at which noise-sensitive residential receptors are located from the loading dock, gas station, tire center, and warehouse mechanical equipment is sufficient to reduce noise levels produced by these sources to levels that would not increase the ambient noise levels by more than 3 dBA. Noise produced by these sources may at times be audible, but the majority of activity will be below ambient noise levels. The day-night average noise level (L_{dn}) will not increase by more than 3 dBA at noise-sensitive residential receptors. Parking lot maintenance and mechanical equipment located on the residual property could produce noise levels that would exceed the noise standards established by the City of Concord. This is a potentially significant noise impact unless the following mitigation measure is implemented.

❑ **MITIGATION MEASURE 4.7-2:** The use of leaf blowers shall be restricted to the hours of 7:00 a.m. to 6:00 p.m., Monday through Saturday.

MONITORING

Mitigation Implementation:	*Project Sponsor*
Monitoring Requirement:	*Confirm submittal of a noise attenuation plan identifying hours of parking lot cleanup*
Responsibility for Monitoring:	*City Planning Division*
Timing:	*Prior to issuance of occupancy permit*

IMPACT 4.7-3: Noise levels associated with development of the residual property could exceed City standards. This is a *potentially significant* impact.

The nearest building to the Sierra Gardens condominiums could be as close as 140 feet. Noise generated by the operation of these buildings could exceed established limits at the Sierra Gardens condominiums. Mechanical equipment on the proposed buildings could be located in close proximity to residential receptors and would need noise attenuation features included in the project's design to ensure the reduction of noise levels below City standards. A noise study would need to be completed by a qualified acoustical specialist before the issuance of building permits to determine noise levels and to recommend attenuation measures.

❑ **MITIGATION MEASURE 4.7-3:** A noise study shall be conducted for the residual property to determine potential noise impacts associated with the future development of buildings and necessary mitigation measures to reduce noise levels below City standards.

MONITORING

Mitigation Implementation:	*Future project sponsor*
Monitoring Requirement:	*Hire noise consultant to be paid by future project sponsor. Confirm preparation of noise study.*
Responsibility for Monitoring:	*City Planning Division*
Timing:	*Prior to start of environmental review process hire noise consultant. During environmental review process for development of residual property confirm completion of noise study.*

IMPACT 4.7-4: Project-generated traffic would not significantly affect adjacent residential, commercial, and industrial land uses. Traffic would access the site via Monument Boulevard and Detroit Avenue. This is a *less-than-significant* impact.

The multi-family residential land uses are located over 800 feet from the roadways that would provide primary access to the site. At this distance, an increase in noise levels by less than one decibel, resulting from project generated traffic along these roadways, would be less than significant. Residential land uses located along Detroit Avenue, north of Monument Boulevard, would experience a similar increase of less than one decibel resulting from project-generated traffic. This project-generated traffic noise level increase would be less than significant to these noise-sensitive land uses. Non-noise-sensitive land uses adjacent to Monument Boulevard and Detroit Avenue would not be affected by the increase in traffic noise levels.

❑ **MITIGATION MEASURE 4.7-4:** None is required.

IMPACT 4.7-5: Construction of the proposed project will temporarily increase noise levels at noise-sensitive receptors. This is a *potentially significant* impact.

Construction activities generate considerable noise. The construction of new buildings on the project site would temporarily increase noise levels in the area. Noise levels during construction would occur in phases, including demolition, grading and excavation, foundations, erection of the new buildings, and paving and finishing. The entire construction period is expected to last 120 to 150 days. Typical hourly average construction noise levels are 75 dBA to 80 dBA measured at a distance of 100 feet from the construction site during busy construction periods. Such noise levels at times would exceed the significance threshold at the nearest residences during construction and cause a short-term noise increase.

❑ **MITIGATION MEASURE 4.7-5:** The project sponsor shall prepare and implement a noise attenuation plan that will include the following measures:

- Limit construction activity between the hours of 7:00 a.m. and 6:00 p.m. with no construction activity on Sundays or holidays without prior written approval by the Chief of Planning.
- Maintain and muffle all construction equipment powered by internal combustion engines.
- Identify construction equipment staging areas that are 200 feet from residential units.

MONITORING

Mitigation Implementation:	*Project Sponsor/Contractor*
Monitoring Requirement:	*Confirm submittal of noise attenuation plan that addresses: construction hours, use of muffled equipment, and staging of equipment. Conduct site inspection to confirm compliance with plan.*
Responsibility for Monitoring:	*City Construction Division*
Timing:	*Submit plan prior to issuance of grading permit. Conduct on-site monitoring periodically during construction.*

4.8 VISUAL QUALITY/AESTHETICS

Setting

This section provides a visual analysis of the proposed development and its impact on visual resources. Numerous photos are included in this discussion to illustrate existing site conditions and visual resources that are visible to motorists and residents. Figure 4.8-1 is a map of the photo location sites depicting views to and from the site.

The site is one of the few remaining vacant large parcels in the City of Concord. As such it has been used for stockpiling rubble and supports a plentiful crop of weeds as well as a variety of trees as shown in the panoramic view of the site in Figure 4.8-2. The site is relatively flat, sloping gently from south to north.

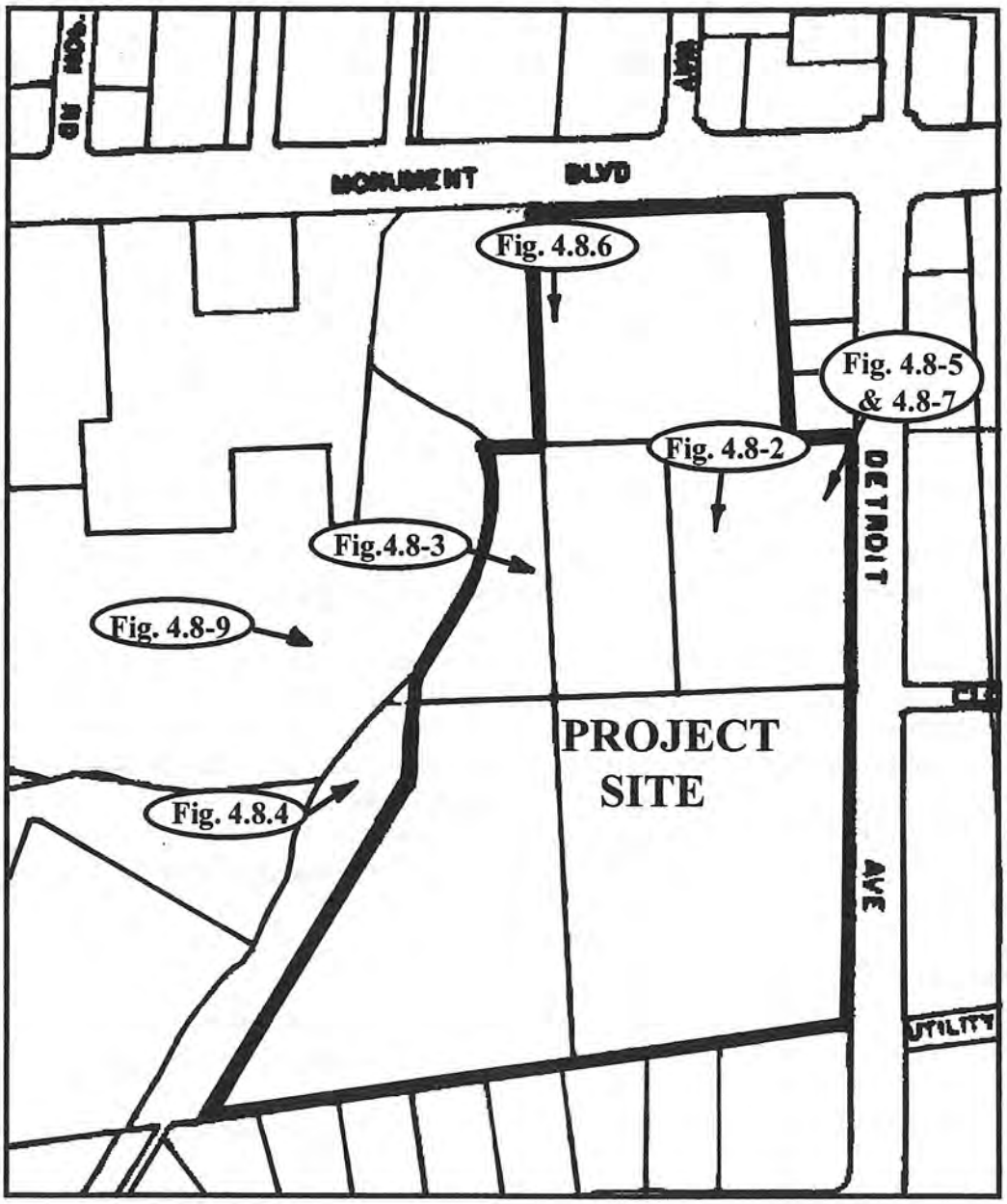
Visual resources in the project vicinity are primarily of Mt. Diablo, Lime Ridge Open Space and the hills above Detroit Avenue, to the east as shown in Figure 4.8-3. Uninterrupted views of Mt. Diablo and the hills east of Detroit Avenue provide a viewshed for residents of the Sierra Gardens condominium complex located immediately southwest of the site, particularly from the second story units. These views are depicted in Figures 4.8-3 and 4.8-4. (The latter photo depicts only a small portion of the Mt. Diablo hills on the right edge of the photo.)

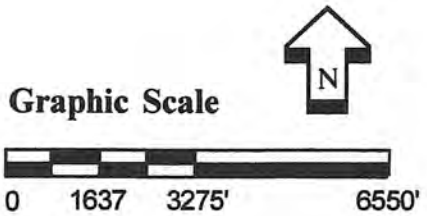
The project site is located in an area that is developed with a mix of commercial and light industrial uses. (Photos depicting these conditions are included in Section 4.1.) Development abuts the south/southwest boundary, and on the northeast and northwest corners. The site fronts on Detroit Avenue and Monument Boulevard. The expanse of the site is visible when traveling in either direction along Detroit Avenue as shown in Figure 4.8-5. However, when traveling along Monument Boulevard, the view of the site is narrowed due to the limited frontage. This view is shown in Figure 4.8-6. When driving along Monument Boulevard, motorists traveling in either direction must turn to look into the site.

General Plan Polices

Policies pertaining to visual quality are found in the Transportation/Circulation Element of the General Plan. Relevant policies pertaining to the Costco project are as follows:

> **GOAL 4: Visual Quality.** Preserve and improve the scenic quality of roadways.
>
> ***Objective 4.1: Scenic Quality.*** Enhance the aesthetic qualities of views from and to public roadways.
>
> > **Policy 4.1.1** Visual amenities shall be considered as part of the design and approval process of proposed public and private projects.
> >
> > **Policy 4.1.2** Enhance aesthetic values through the design and landscaping of streets and the control of visual and functional aspects of abutting improvements.



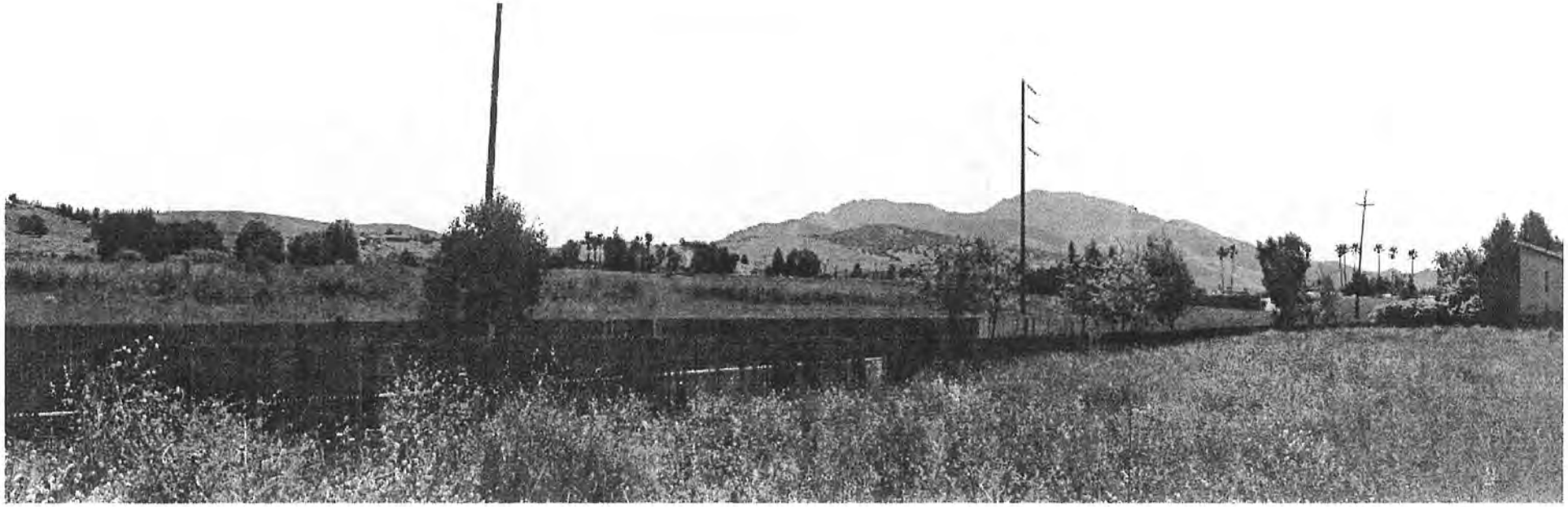


Source: Mills Associates

Figure 4.8-1 Photo Location Key

Source: Mills Associates

Figure 4.8-2 Southerly View Across Site



Source: Mills Associates

Figure 4.8-3 Easterly View Across Site of Hills above Detroit Avenue, Lime Ridge and Mt. Diablo

Source: Mills Associates

Figure 4.8-4 **Easterly View Across Site From Sierra Gardens, Building 9, Unit 70**

Figure 4.8-5 **View of Site When Traveling South on Detroit Avenue**

Source: Mills Associates

Figure 4.8-6 **View of Site From Monument Boulevard**

Impacts and Mitigation Measures

Methodology

In general the first step in preparing a visual impact analysis is to determine the locations from which the project site is visible and to analyze the impact of the proposed development on views. To determine if the visual impact is significant or insignificant, a number of factors must be considered which include:

- Percentage of viewshed. The portion of the total area that can be seen which is comprised by the site. Is the site part of a larger distant view or does it fill the whole view area.
- Duration of view. The amount of time attention is focused on a particular view: Is the site in view for a significant period of time?
- Frequency of viewers. The number of people who will view the site in a given period of time. Will a significant number of people see the site from this location?
- Angle of view. Location of site within total view area. Is it directly in the line of sight or is it peripheral part of the view?

Key viewpoints were selected for simulating views of the project after construction. Two viewpoints were selected — from Detroit Avenue and from the vacant parcel adjacent to the Sierra Gardens condominium development. For each of the two views, photographs of the planning area were made and computer-generated photorealistic visual simulations were prepared to illustrate how the view is expected to appear after project completion. The simulations were derived from information obtained from the Costco architect.

Significance Criteria

Impacts and mitigation measures related to visual and aesthetic effects focus on the impacts for off-site viewers. CEQA Guidelines Appendix G (1998) revised indicate that a project will normally have a significant adverse effect on the environment if it has a substantial, demonstrable negative aesthetic effect.

This determination is based upon several criteria, including observer position, view corridors, existing and proposed screening, backdrop, and characteristics of the proposed development. The existing visual character of the surrounding area is also taken into account in applying this definition. This analysis also considers the City's General Plan goals and policies to preserve the scenic beauty of the City as a basis for evaluating visual impacts. There is no quantitative method for assessing visual quality and aesthetic impacts; thus judgement of the significance of a particular effect may be expected to differ among viewers (readers of the document). For this analysis the following criteria are used to determine whether a significant visual impact occurs. Does implementation of the Costco project:

- substantially and negatively affect visual character in areas of moderate to high visual sensitivity through the introduction of incompatible elements as they relate to scale, form, line, color or texture;

- substantially and negatively alter existing visual character of an area or viewshed from rural, pastoral or or natural to urban, commercial or other more dense land use pattern;
- substantially and negatively block or screen views caused by the introduction of new development; or
- conflict with adopted goals and policies of the City General Plan.

Project Details

Costco is proposing a single building that encompasses 155,837 square feet with dimensions of approximately 468 feet long by 333 feet wide. The longer dimension fronts Detroit Avenue and sits back 30 feet from the edge of Detroit Avenue. The main building height varies between 27'4" and 30'8". The building exterior will be of masonry concrete units. To help break up the building facade, portions of the exterior walls will be textured (vertical scoring of the concrete). The remainder of the exterior surface will be smooth. Three different color tones of beige ranging from dark to light will be used on the exterior finish. Accents of the Costco "red" color will be seen on the south and east elevations. There are no building plans at this time for the residual property. This parcel will be developed as individual building plans are submitted and, like the project, will be subject to design review by the City.

The gas service station is a separate canopied structure encompassing 1,075 square feet and is located directly across from the store along the westerly property line. The gas station area will include three islands with two pumps each which can accommodate 12 vehicles at one time. The canopy over the gas islands will be 32 feet wide and 17'6" high. The supporting columns will be covered in the same material as that used for the main building. The service area will be lighted by 400-watt metal hallide lamps, recessed into the canopy.

The parking lot will be lighted by 26, 35-foot-tall light poles, each containing two, 1,000-watt metal hallide lamps recessed within a "shoe box" style fixture that measures 26 inches square. The proposed lights are similar to what is used at the Martinez location.

The poles are interspersed throughout the parking lot, typically spaced to light two rows of parking with one pole located at each end of the parking row. There are no light poles around the perimeter of the property with the exception of one pole that has one light that is located along the westerly property line, north of the gas service center. All of the other light poles are contained within the parking lot, away from the perimeter.

Landscaping is proposed throughout the parking lot, along the street frontage, adjacent to the structure and around the site perimeter. A planting mix is proposed which consists of shrubs, grass, groundcover, accent plants and a mix of tree species, including canopy street trees, broadleaf shade trees, evergreens and accent trees. (Refer to the Concept Landscape Plan in Figure 2-3.)

Project Impacts

IMPACT 4.8-1: The Costco building will dominate the west side of the Detroit Avenue streetscape between Monument Boulevard and Shary Circle. This is a *potentially significant* impact.

The project sponsor has minimized the visual and noise impacts to the residents of the Sierra Gardens condominium complex by locating the structure along the eastern property line, close to Detroit Avenue. The building has been sited with its longer facade facing the roadway. The size of the building and its close proximity to Detroit Avenue will be prominently visible within the Detroit Avenue corridor.

Figures 4.8-7 and 4.8-8 illustrate existing and post construction views of the site. The computer simulation depicted in Figure 4.8-8 reflects the design and exterior finishes as shown in the elevations in Chapter 2, but without the landscaping. As shown in Figure 2-6, the landscaping will help to break up the building facade. The Costco building is considerably larger and bulkier than other buildings in the immediate project vicinity. The entire square footage is contained within one structure rather than broken up into smaller buildings. Thus, the mass of the building overshadows the buildings in the Shary Circle Business Park, the PG&E facilities and the buildings across Detroit Avenue from the project site and is prominent within the motorist's viewshed. A point could be made that the proposed structure is compatible in bulk and height as the continuous span of storefronts located across Detroit Avenue from the project site. However, unlike the Costco easterly facade, these buildings are broken up with several windows, roll-up doors and entries.

The General Plan is very clear in its goals, objectives and policies pertaining to visual quality of a project on the existing environment (Goal 4, Objective 4.1, policies 4.1.1 and 4.1.2; Objective 6.2 and Policy 6.2.4d). The scenic quality of roadways should be preserved and the aesthetic qualities of views from a roadway should be enhanced which can be done by providing visual amenities as a part of the design. Development within industrial/business park areas is to be compatible in terms of function, appearance and safety concerns. The criteria used to judge the appropriateness of high-volume, warehouse retail use include aesthetic impacts on major transportation routes. (Detroit Avenue and Monument Boulevard are considered major transportation routes.) In addition to the General Plan, the City's Community Design Guidelines (1987) contain recommendations that provide guidance in the design of large-scale buildings. To reduce building bulk the guidelines recommend various treatments that will give a human scale to larger, bulkier buildings. Such treatments include architectural relief such as projections and indentations, detailing that can create shade and cast shadows, the use of trellises and canopies to break up the linearity of a facade and the use of color to mitigate the apparent size of a building mass.

Source: Mills Associates

Figure 4.8-7 View of Existing Site Conditions from Detroit Avenue

Source: CADP

Figure 4.8-8 **Computer Simulation of Post Project Conditions as Viewed from Detroit Avenue**

Features have been included on project plans to minimize the impact of the structure on the street corridor. Project plans call for scoring portions of the exterior walls, adding three trellises on the eastern facade, placing canopies over the "non public" doorways, scoring portions of the exterior facades, and varying the height of the parapet to help break up the building mass. Furthermore, the building setback from Detroit Avenue is greater than required in the zoning ordinance. This permits a denser planting pallette between the street and the structure. All of these features incorporated into the design help to reduce the massiveness and the visual dominance of the structure from Detroit Avenue.

The landscape plan calls for the use of canopy street trees (sycamores) along the street frontage with evergreens and shrubs planted next to the structure in groupings of three. This will help to minimize the expanse of the eastern facade when the trees mature and are fully leafed. However, because this species is deciduous, during the late fall through early spring months when the trees are bare, the building will appear more prominent in the view corridor within the Detroit Avenue view corridor.

Trellises have been placed in three locations along the eastern wall. Two are located in the middle section of this wall and a third trellis is located at the northeast end. The placement of these trellises coupled with the groupings of evergreen trees also helps to minimize the mass of the building. Additional trellises are needed on the eastern wall to further break up the linearity as shown in Figure 2-7.

Large expanses of wall are devoid of architectural detail on the southern and western elevations as shown in Figure 2-7. The southern elevation is visible to motorists traveling northward on Detroit Avenue and the western elevation is visible to the customers of Costco. The use of trellises, scoring the concrete and painting the wall a different shade or placing trees adjacent to the structure would help to reduce the mass along these two elevations.

❑ **MITIGATION MEASURE 4.8-1A:** The project sponsor shall revise project plans to include additional trellises along the eastern wall to the left and right of the middle section where two trellises are currently proposed.

MONITORING

Mitigation Implementation:	*Project Sponsor*
Monitoring Requirement:	*Confirm revision to landscape plan incorporating additional trellises on eastern wall*
Responsibility for Monitoring:	*City Planning Division*
Timing:	*Prior to use permit approval*

- **MITIGATION MEASURE 4.8-1B:** The project sponsor shall incorporate additional architectural treatment or landscaping on the southern and western elevations where large expanses of blank wall are visible. This can include the use of trellises, the planting of additional trees next to the building, or scoring the concrete and painting the wall with a darker tone.

MONITORING

Mitigation Implementation:	*Project Sponsor*
Monitoring Requirement:	*Confirm revision of plans for southern and western elevations incorporating use of trellises, planting of additional trees, or addition of architectural treatment*
Responsibility for Monitoring:	*City Planning Division*
Timing:	*Prior to use permit approval*

IMPACT 4.8-2: The Costco building will be visible to residents of the Sierra Gardens condominiums who face the project site, but will not block views from the units. This is a *less-than-significant* impact.

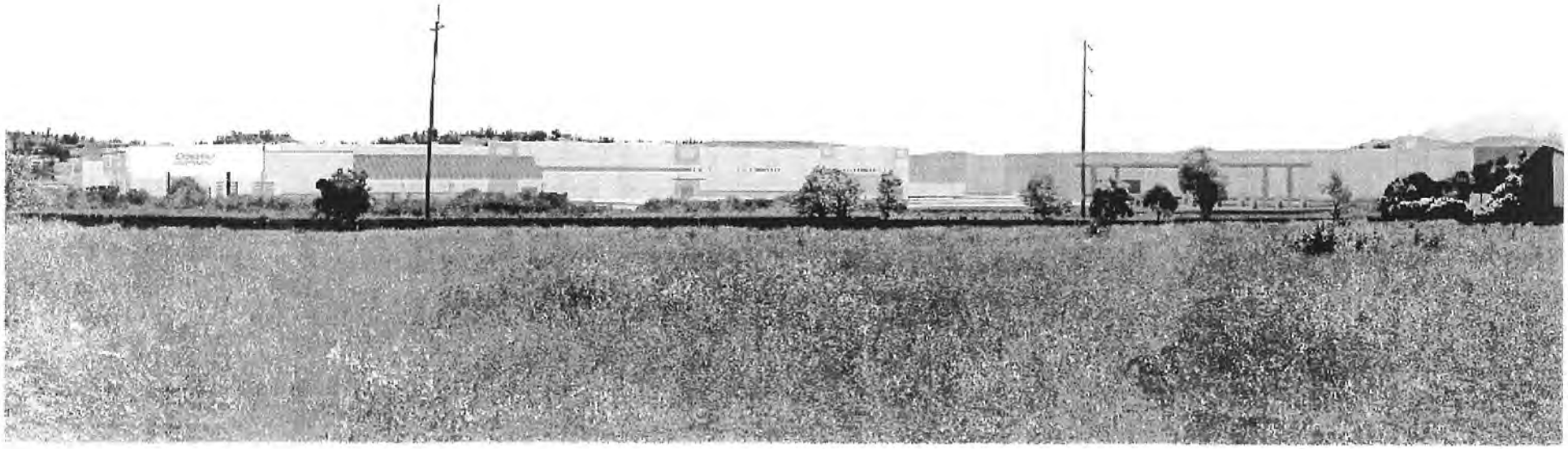
Near views from the residential units are primarily of the project site. Mid-views take in the development along Detroit Avenue and far views are of the hills above Detroit Avenue and of Mt. Diablo to the southeast. The area is essentially built up with the exception of the project site. Figure 4.8-4 illustrates this view from Unit 70 in Building 9, which is the closest building to the project site. Figure 4.8-9 also depicts a similar view.

Residents with east-facing views will see the Costco structure, parking area, gas station and daily activity that will occur on the site. Figure 4.8-10 provides a computer simulation of the Costco facility as seen from the Sierra Gardens condominiums. The near view of the site will be altered from that of a vacant, weedy parcel to one that is developed. As noted in Figure 4.8-10, the mid-views of development along Detroit Avenue will be partially blocked, but the distant views of the hills will continue to be visible from the second-story units. (Residents of the first story will not see the development because of the wooden fence that separates the units from the project site.)

The significance criteria described at the beginning of this Impact discussion identifies three criteria which are pertinent to how the project would impact the residents of Sierra Gardens condominiums. Primarily, the criteria asks whether a project substantially and negatively affects visual character in areas of moderate to high visual sensitivity, alters existing visual character of an area or viewshed, and blocks or screens views.

Source: Mills Associates

Figure 4.8-9 **View of Existing Site Conditions from West of Project**



Source: CADP

Figure 4.8-10 **Computer Simulation of Post Project Conditions as Viewed from West of the Site**

Because the near and mid-views are not considered to be of moderate to high visual sensitivity the implementation of the project would not create a significant impact. The distant views, which are considered to be of moderate to high visual sensitivity would be retained as seen in Figure 4.8-10. The building is sited approximately 585 feet from the nearest residential unit and as such, does not block the distant views of the hills. The distance also helps to minimize the size of the structure, thereby reducing the visual intrusion for residents overlooking the project site. Therefore, this impact is considered to be less than significant.

❑ **MITIGATION MEASURE 4.8-2:** None is required.

IMPACT 4.8-3: The gas station and the glare of its lights will be visible to residents overlooking the project site. This is a *potentially significant* impact.

Residents of Building 9 in the Sierra Gardens development are located the closest to the gas station and would be the most effected by its close proximity to the complex. Particularly, residents on the second floor overlooking the site will view the gas station. The most noticeable aspect of this structure will be the lighting emanating from the recessed lights in the canopy roof. The lights will be pointing downward from the canopy to light the gas pumps and the pavement. A photometric analysis of the lighting plan shows that the footcandles[1] generated by the canopy lights within the cover of the canopy will range from a high of 11.4 to a low of .13 which is closer to the property line and further away from the direct glare of the canopy lights. Although the lights will not shine into the residences, nonetheless the residents will see a bright glare in this portion of the project site. The higher footcandle levels are equivalent to lighting a basketball court and the lowest footcandle level is equivalent to a moonlit night.

The project sponsor has provided a tree screen that is a mix of evergreen and broadleaf shade trees to help block the glare from the gas station lights. The trees are placed between the gas station and the western property line and extend along the property line approximately 60 feet. The trees will help to block the glare from the gas station area, however, the screen needs to be extended around the southern perimeter of the gas station to provide adequate screening for the residents.

❑ **MITIGATION MEASURE 4.8-3:** The project sponsor shall revise the landscape plan to extend the tree mix around the south/southwest perimeter of the gas station area. The depth of the planting should be similar to that placed between the western property line and the gas station area as shown on the conceptual landscape plan in Figure 2-3.

[1] Footcandle is a unit of lighting intensity roughly equivalent to the illumination produced by one candle falling on a perfectly reflecting surface of one square foot in area at a distance of one foot.

MONITORING

Mitigation Implementation:	*Project Sponsor*
Monitoring Requirement:	*Confirm that appropriate revisions have been made to landscape plan*
Responsibility for Monitoring:	*City Planning Division*
Timing:	*Prior to use permit approval*

IMPACT 4.8-4: The glare of the parking lot lights will be evident to residents overlooking the project site. This is a *potentially significant* impact.

At night residents of the Sierra Gardens complex who look directly upon the project site view a darkened, vacant parcel. Eighteen units face directly onto the site of which four have a tree screen. From these units lights can be seen along Monument Boulevard and Detroit Avenue, however, the units are located at a great enough distance that the glare of the lights do not impact residents. With development of the project site nighttime conditions will be altered significantly. The lighting plan calls for locating 26, 35-foot high poles throughout the parking lot. Each pole would contain two, 1,000-watt metal hallide lamps contained within a 26-inch square box. The lights in the parking lot would be on until after closing hours (10:00 p.m. weekdays and 6:00 p.m. weekends).

The lights will be visible to the second story residents of Sierra Gardens because the poles will be higher than the two-story condominium complex. The landscape plan calls for a mix of trees around the perimeter, but until the trees reach maturity, the lights will be seen.

A review of the project sponsor's photometric analysis indicates that the footcandles generated by the parking lot lights can be as high as 12.5 footcandles near the individual light pole, to a low of 1.2 footcandles near the site perimeter. (It should be noted that no lighting is proposed on the residual parcel at this time and footcandle levels are minimal. These low levels are not considered in this analysis since this lighting condition is temporary until the residual parcel is developed.) Although the light fixtures are designed to point downward onto the parking area, and there is only one light pole located closest to the residential units, the glare of the lights will be noticeable to residents who overlook the project site.

The overall light level created under the proposed lighting plan appears excessive and is twice as high as what is typically used for a stand-alone facility. Typical lighting criteria values for a stand alone structure is 1.0 footcandle at the perimeter of the site and 2.0 footcandles along the drive lanes. Such criteria is used at similar large box retail stores.[1] The project sponsor's plan shows that around the perimeter the majority of the measurements exceed 2.0, and along the drive lanes the measurements mostly exceed 3.0 and 4.0 footcandles. The parking lot could be effectively lit by using two, 400-watt cutoff style horizontal lights placed on 30-foot-tall poles. The higher

wattage lights consume more energy and their performance is about the same as the lower wattage lights. The 400-watt bulb also has a longer life than the 1,000-watt bulb.

A review of the lighting plan shows that the light poles are placed at the ends of the parking rows in the landscape planters where accent trees or shade trees are proposed. This creates a conflict between the trees and the lights, particularly when the trees reach maturity. The light will be obscured which creates dark spots in the parking lot. The light poles could be placed in the center of the parking row rather than at the end to avoid conflict with the landscaping, or the trees could be placed in the center of the parking row.

As the residual property develops, the intensity of the lighting will increase overall. Residents in the other buildings who face this portion of the project site will encounter glare as well.

❑ **MITIGATION MEASURE 4.8-4A:** The project sponsor shall reduce the wattage of the parking lot lights as well as install shorter light standards that do not exceed 30 feet. Two, 400-watt bulbs could be used on 30-foot-tall light poles.

MONITORING

Mitigation Implementation:	*Project Sponsor*
Monitoring Requirement:	*Confirm that appropriate reductions in wattage and pole height have been made on lighting plan. Conduct on-site inspection prior to occupancy.*
Responsibility for Monitoring:	*City Planning Division*
Timing:	*Review plan prior to use permit approval and conduct site inspection prior to issuance of occupancy permit*

❑ **MITIGATION MEASURE 4.8-4B:** The project sponsor shall revise either the landscape plan or the lighting plan to avoid lighting conflicts between the trees and light poles. Either place the lights in the middle of the parking row reserving the ends for landscaping, or place a grouping of trees in the center of the parking row. If the latter alternative is selected, shrubbery should be placed around the base of the light pole.

MONITORING

Mitigation Implementation:	*Project Sponsor*
Monitoring Requirement:	*Confirm that appropriate revisions have been made to either the landscape or lighting plan*
Responsibility for Monitoring:	*City Planning Division*
Timing:	*Prior to use permit approval*

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[1] Ronald Zeiger, Zeiger Engineers, Inc., Lighting Consultant, personal communication, August 10, 1999.

4.9 CULTURAL RESOURCES

Setting

Prehistoric Background

The proposed Costco site is located in an area that was occupied by the Penutian-speaking Bay Miwok at the time the Spanish arrived in the 18th century. Their territory encompassed much of the San Francisco Bay area and extended eastward to the Central Valley. The Bay Miwok are known to have occupied this region at least since 300 A.D., though their presence may date back as far as 2500 B.C. At the time of contact with the Europeans, there were an estimated 700 Miwok in Contra Costa County, along with about 1,000 Native Americans from other tribes. The Spanish referred to the Bay Miwok as Costanoans, derived from "Los Costaños," which is Spanish for "the Coast people."

The project area was occupied by a small Costanoan tribelet known as the Saclan. The Saclan were one of the many subgroups that composed the Miwok. Each tribelet occupied a defined territory and controlled the natural resources within their territory. The small villages were generally located near sources of fresh water such as creeks and springs, though they were also found on alluvial flats and along the first set of ridges between valleys and mountain ranges. Although each tribelet was independent politically, the various Miwok groups were united by their common language, a subdivision of the Utian language family.

Infiltration of Europeans into the Bay Area rapidly led to the decimation of the Costanoan people. They were forced into servitude on the Spanish missions and large "rancherias" in northern Alameda and Contra Costa counties. Disease and overwork, as well as conflicts with other tribal groups, led to their decline. By the beginning of the American historical period (1848), the Costanoans had ceased to exist as an ethnic or linguistic entity. One authority has estimated that the Saclan subgroup of the Costanoans was virtually extinct by 1800, twenty-eight years after initial contact with the Spanish.[1]

Historic Background

The project region was historically devoted to ranching, orchards, and other agricultural uses. Coal was discovered on the northern slopes of nearby Mt. Diablo in 1848, drawing settlers to the area and leading to the development of a number of new communities. However, by the mid-1880s, the coal was largely exhausted and the mining "boom towns" that had been created were deserted. The population centers of Concord and Walnut Creek survived, owing to their reliance on an agricultural economic base.

Archival Search

An archival records and literature search was conducted by the staff of the California Historical Resources Information System's Northwest Information Center (NIC) at Sonoma State University in Rohnert Park, California. The NIC reported that there are no recorded historical or archaeological sites on or adjacent to the project site listed in state or federal cultural resource inventories.[2] However, the nearby St. Stephens Cemetery on Monument Boulevard is listed in the Historic Property Data File maintained by the California Office of Historic Preservation. In addition, a cultural resources investigation was conducted on the adjacent drainage (Pine Creek)

bordering the west side of the property.[3] Although this investigation did not discover any cultural resources, it determined that substantial earthmoving activities previously occurred in the area.

The NIC report noted that native soils in the vicinity of the project potentially contain "aboriginal artifacts and skeletal remains" or fossils.[4] The project site is located on alluvium adjacent to a fresh-water creek. As noted in the discussion above, local Native American groups frequently established villages in such settings. Accordingly, the NIC concluded that there is a moderately high probability of encountering Native American resources on the project site. Such prehistoric resources might include chert or obsidian flakes; projectile points; mortars and pestles; charcoal; and dark, friable soil containing shell and bone dietary debris, heat-affected rock, or human burials. The NIC report recommended further archival research and a field survey by a qualified archaeologist.

The archival records search determined that a few buildings were established on the north side of the project area by 1943 and that historic trails and roads passed through or near the site when the land was part of the 19th-century Arroyo de las Nueces y Bolbones. The NIC concluded that there is a low to moderate possibility of encountering historic material beneath the stockpiles soils on the site. Potential buried resources could include stone or adobe foundations or walls; structures and remains with square nails; glass; metal; ceramics, brick; wood; and refuse deposits, often in old wells and privies.

Field Survey

In accordance with the recommendation of the Northwest Information Center, an archaeological field survey was conducted. A senior staff archaeologist conducted a pedestrian survey of the project area on May 21, 1999, examining all visible ground surface for the presence of historic or prehistoric archaeological indicators. Although no evidence of historic or prehistoric resources were observed, WSA concluded that the potential remains to encounter such resources during project construction.[5]

City of Concord General Plan Policies

The following Concord General Plan goals, objectives, and policies pertaining to cultural resources are potentially relevant to the proposed project:

> **GOAL 16: Cultural Resources.** Preserve and enhance Concord's cultural resources.
>
> ***Objective 16.1: Historic Resources.*** Provide for retention and commemoration of Concord's historic sites and structures.
>
> > **Policy 16.1.1.** It is intended that all city, state, and federally designated historic sites and structures be preserved to the maximum extent feasible. Relocation of certain structures to a central or single location should be examined as a preservation tool.
> >
> > **Policy 16.1.2.** Protect and enhance the status of historical resources in the community.

Policy 16.1.3. The City shall follow the recommendations of the state offices in charge of historic resources with respect to managing impacts of development and land use on historic resources.

Objective 16.2: Prehistoric Resources. Afford protection to prehistoric cultural resources.

Policy 16.2.1. The City shall follow the recommendations of the state offices in charge of prehistoric resources with respect to managing impacts of development and land use of archaeological resources.

Policy 16.2.2. Important archaeological sites will be preserved.

Policy 16.2.3. In identified sensitive areas, the City will require archaeological studies as part of the development review process.

Impacts and Mitigation Measures

Significance Criteria

The recently revised Environmental Checklist Form (Appendix G) of the *CEQA Guidelines* identifies a number of significant environmental impacts related to cultural resources, including:

- a substantial adverse change in the significance of a historical resources as defined in Section 150645 of the *Guidelines*;
- a substantial adverse change in the significance of an archaeological resources as defined in Section 150645 of the *Guidelines*;
- direct or indirect destruction of a unique paleontological resource or site or unique geologic feature; or
- disturbance of human remains, including those interred outside of formal cemeteries.[6]

Section 15064.5, referenced in the standards, was also recently added to the *CEQA Guidelines*. This section defines a historical resource as a resource listed or eligible for listing in the California Register of Historical Resources or in a local register of historical resources. A lead agency under CEQA also may determine an object, building, structure, site, area, place, record, or manuscript to be an historical resource, provided the determination is "supported by substantial evidence in light of the whole record."[7] A lead agency may generally consider a resource to be historically significant if it meets the criteria for listing on the California Register of Historical Resources, including the following:

- it is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage;
- it is associated with the lives of persons important in our past;

- it embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values; or
- it has yielded, or may be likely to yield, information important in prehistory or history.[8]

Section 15064.5, refers to Public Resources Code Section 21083.2 for a definition of a unique archaeological resource, which means an archaeological artifact, object, or site about which it can be clearly demonstrated that, without merely adding to the current body of knowledge, there is a high probability that it meets any of the following criteria:

- it contains information needed to answer important scientific research questions and there is a demonstrable public interest in that information;
- it has a special and particular quality such as being the oldest of its type of the best available example of its type; or
- it is directly associated with a scientifically recognized important prehistoric or historic event.
- has yielded, or may be likely to yield, information important in prehistory or history.[9]

The standards of significance listed above are adopted for use in this EIR.

Project Impacts

IMPACT 4.9-1: Construction of the proposed Costco facility would involve site grading that could potentially disturb and damage buried historical and/or archaeological artifacts or human remains. This is a *potentially significant* impact.

The project site is located on alluvium adjacent to a fresh-water creek, a setting that was favored by indigenous Native Americans for the establishment of settlements. If the site was used by Native Americans during the area's prehistory, artifacts from this period may lie buried on the site. An archival records search also indicates that buildings were established on the site as early as 1943. There is the possibility that remains from these buildings or artifacts associated with them may lie buried on the site. The Office of Historic Preservation has determined that buildings, structures, and objects 45 years or older may be of historical value. Disturbance of buried historical or archaeological resources would be a potentially significant impact. Implementation of the mitigation measures recommended below would reduce the impact to less than significant.

❑ **MITIGATION MEASURE 4.9-1A:** During all grading and excavation activities, if cultural resources are encountered, all work shall be halted and the Planning Division notified at once.

MONITORING

Mitigation Implementation:	*Contractor*
Monitoring Requirement:	*Notify City Planning Division when cultural resources encountered*
Responsibility for Monitoring:	*Contractor/City Planning Division*
Timing:	*During grading/excavation activities*

❑ **MITIGATION MEASURE 4.9-1B:** If human remains are among any artifacts uncovered during site disturbance or excavation, all ground-disturbing work shall cease, and the County Coroner and City of Concord Chief of Planning and Building Official must be notified immediately. If the coroner determines the remains to be Native American, the Native American Heritage Commission must be contacted within 24 hours. The qualified archaeologist, in consultation with the Native American Heritage Commission, will recommend subsequent measures for disposition of the remains.

MONITORING

Mitigation Implementation:	*Contractor and/or Archaeologist*
Monitoring Requirement:	*Confirm completion of contact with County Coroner, Native American Heritage commission, and qualified archaeologist*
Responsibility for Monitoring:	*City Planning Division*
Timing:	*Immediately following notification by project sponsor*

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[1] Cook, S.F., *The Aboriginal Population of Alameda and Contra Costa Counties*, 1957.

[2] California Historical Resources Information System, Northwest Information Center, letter report on "City of Concord proposed 'Big Box' Development," File No. 99-296, May 10, 1999.

[3] Kandler, Edward R. and Mark O. Rudo, *Cultural Resources Survey, Walnut Creek Project Area, Contra Costa County, California*, 1980.

[4] Helly, E.J., K.R. Lajoie, W.E. Spangle, and M.L. Blair, "Flatland Deposits of the San Francisco Bay Region – Their Geology and Engineering Properties, and Their Importance to Comprehensive Planning," Geological Survey Professional Paper 943, United State Geological Survey and Department of Housing and Urban Development, 1979.

[5] William Self Associates, *Archaeological Survey of Proposed Costco Warehouse Project Area on 21.7 Acres at Monument and Detroit Avenue, Concord, Contra Costa County, California*, May 25, 1999.

[6] Governor's Office of Planning and Research, *CEQA Guidelines*, Appendix G, Section V, revised October 26, 1998.

[7] Governor's Office of Planning and Research, *CEQA Guidelines*, Section 15064.5(a)(3), revised October 26, 1998.

[8] *Ibid.*

[9] Public Resources Code, Section 21083.2(g).

5
IMPACT OVERVIEW

5
IMPACT OVERVIEW

5.1 SIGNIFICANT AND UNAVOIDABLE ADVERSE IMPACTS

Chapter 4 has identified one impact that cannot be mitigated to an acceptable level — Impact 4.3-3. The project will increase regional regional emissions that cannot be mitigated to an acceptable level. The location and character of the project limits the potential for reducing the regional air quality impacts. The project is not conducive to attracting patrons to use transit, walk or bicycle to the Costco facility.

All other impacts identified in Chapter 4 can be mitigated to a less-than-significant level.

5.2 BENEFICIAL IMPACTS

The proposed project will provide sales tax revenues to the City of Concord, as well as provide jobs for local residents. It will also be sited in a central location that will be easily accessible to residents of Concord, Walnut Creek, Pleasant Hill and the Lamorinda area.

5.3 IMPACTS FOUND NOT TO BE SIGNIFICANT

Based upon the Initial Study evaluation (Appendix A), the project would not create an impact on population and housing, site geology/soils, energy and mineral resources, public services, utilities and recreational resources.

5.4 CUMULATIVE IMPACTS

The cumulative analysis takes into account development of vacant parcels in the immediate vicinity of the project site and projections established in the City's Growth Management Element.

Drainage

The Flood Control and Water Conservation District confirmed that the Pine Creek channel has adequate capacity to accommodate project runoff and future development within the watershed. Therefore, no cumulative impacts are anticipated.

Air Quality

As build out occurs within the region, new traffic will increase regional emissions. Traffic mitigation measures will help to reduce emissions, as well as programs to reduce vehicle trips, such as car pooling, availability of transit service, electric cars and telecommuting.

Traffic/Circulation

Implementation of the proposed project in conjunction with projected buildout in the City of Concord would contribute cumulative impacts on traffic conditions particularly at the Detroit Avenue/Whitman Road intersection. The LOS will deteriorate to F during the Saturday peak period. Queuing conditions will worsen at the Monument Boulevard and Detroit Avenue intersection that would exceed left-turn lane capacity and degrade the level of service below acceptable levels. Mitigation measures recommended in Section 4.4 (Measures 4.4-4 and 4.4-5) will bring these impacts to a less-than-significant level.

Biological Resources

The project will result in the loss of approximately 21 acres of ruderal habitat and the removal of approximately 53 trees. The conversion of ruderal habitat on site represents an incremental loss of foraging and potential nesting habitat. However, the value of these habitats is limited by the degraded quality of the habitat on site, its isolation from extensive areas of open space in the region, and the proximity of urban development surrounding the project site. Therefore, conversion of this habitat does not represent a significant adverse cumulative effect.

Cumulative impacts to other resources within the study area would not be considered significant.

Noise

Cumulative traffic in the project vicinity will increase vehicle noise. However, the Sierra Gardens Condominiums are located more than 800 feet from either Detroit Avenue or Monument Boulevard so that any noise increase will not be perceived. Residents, however, may be impacted by mechanical noise when the residual piece of property is built out. Because the condominiums are located in closer proximity to the future development of this parcel, care must be taken to shield mechanical equipment to reduce noise levels. As this property is developed, a noise study must be undertaken to determine the potential noise impact to residents of the Sierra Gardens Condominiums (refer to discussion in Section 4.7 and Mitigation Measure 4.7-2).

Visual

As the area around the Costco site is developed, views from the condominiums and the roadways will be of an urban setting. Providing building heights are restricted to less than thirty five feet, views from Sierra Gardens of Mt. Diablo and Lime Ridge will remain.

5.5 GROWTH-INDUCING IMPACTS

The proposed project is considered infill within the City of Concord, and as thus, does not create growth-inducing impacts. There are very few sites within the City of Concord that can accommodate the Costco warehouse and are centrally located. The site is designated in the General Plan for a retail box facility or an industrial/business park.

5.6 SIGNIFICANT IRREVERSIBLE ENVIRONMENTAL CHANGES

Development of the project site would eliminate a vacant piece of property that has been used to stockpile rubble for the past several years. It is not a productive piece of land and is surrounded by urban land uses. The loss of the site as an environmental resource is an insignificant impact. The effect of removing the ruderal grassland and trees is discussed in Section 4.5 and is not considered to be a significant habitat or biological resource.

6
ALTERNATIVES

6
ALTERNATIVES

6.1 INTRODUCTION

CEQA Guidelines, Section 15126(d), require that an EIR describe a range of reasonable alternatives to the proposed project which could feasibly attain most of the basic objectives of the project. The project sponsor's objectives are as follows:

1) Relocation of the existing Costco facility in Martinez to a location that is more easily accessible for that warehouse's membership, which includes not only members living in the City of Concord, but also in Pleasant Hill, Lafayette, Walnut Creek, Clayton and Martinez (see Global Trip Distributions in Appendix D-1).

2) Relocation of the existing Martinez facility to a site which will minimize overlap of trade areas with other Costco facilities, in particular the warehouse in Antioch.

3) Replacing the existing Martinez warehouse (which is only 120,893 square feet) with a state-of-the-art, full-sized warehouse to better serve Costco's members.

4) Development of the vacant 21.4-acre commercial parcel with a Costco Wholesale warehouse and gasoline service area and a complementary mix of light industrial and wholesale uses.

5) Enhancement of the area with an economically viable, unified wholesale/industrial center which is architecturally designed with integrated development guidelines for the entire project.

6) Subdivision of the project site for potential future sale, lease, or financing purposes to ensure continuity of unified design.

7) Completion of the relocation by September 2000.

The range should include alternatives that could feasibly accomplish most of the basic purposes of the project and could avoid or substantially decrease the significant effects identified for the project even if these alternatives impede to some degree the attainment of project objectives or are more costly.

The CEQA Guidelines identify the following factors to be taken into account when assessing the feasibility of alternatives; general plan consistency, regulatory limitations, site suitability, economic viability, availability of infrastructure, and jurisdictional boundaries. The alternatives are to be limited to ones that would avoid or substantially lessen the significant impacts of the project; with detailed assessment given to only those alternatives that are feasible.

The alternatives are required by CEQA to include a "No Project" analysis which is to discuss existing conditions and what could reasonably be expected to occur on the site in the foreseeable future given current community plans and available public infrastructure and services. In addition CEQA Guidelines require that an environmentally superior alternative be designated. If the alternative with the least environmental impact is the "No Project" alternative, then one of the remaining alternatives is to be designated as the environmentally superior alternative.

This analysis considers four alternatives which are: 1) No Project; 2) an Alternative Site Plan (similar plan as that proposed), 3) Alternative Sites, and 4) Development as Industrial/Business Park. An analysis follows for each of the alternatives.

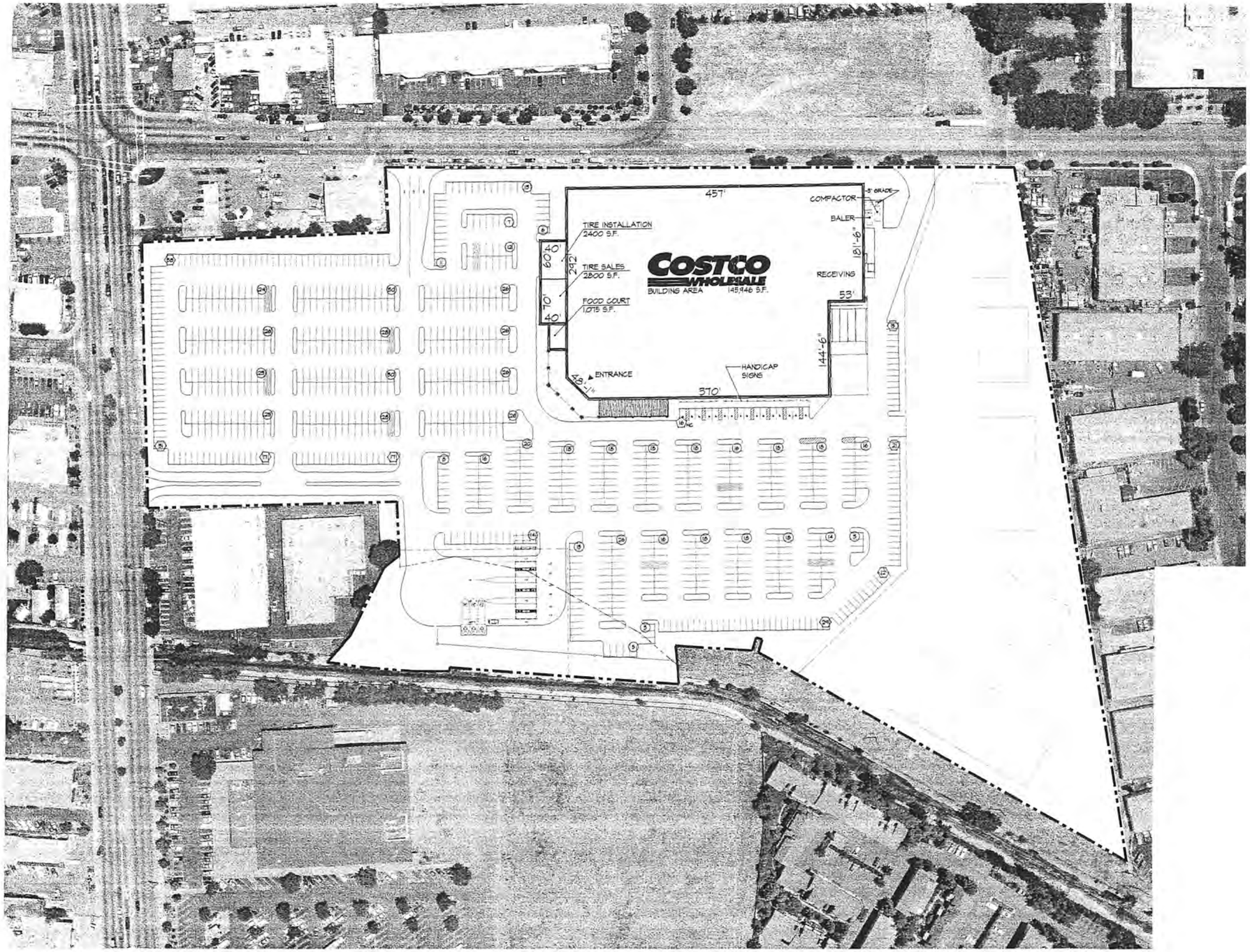
6.2 NO PROJECT ALTERNATIVE

The site is designated on the General Plan Map as Regional Commercial/Industrial Business Park. The proposed project is consistent with this designation and could be permitted. If the Costco project should not be implemented, then it can be assumed that other applications will eventually be filed for projects that comply with the General Plan designation. Until another project is implemented, the site would remain vacant.

The isolated, fragmented nature of the site, high level of human activity and limited rodent activity greatly reduces foraging opportunities by wildlife. Under the No Project Alternative, the limited wildlife use of the site is expected to continue at its current level. Other conditions, such as traffic, noise, air quality and drainage would change as a result of off-site development. Residents to the southwest would continue to view a vacant site. The "no project" alternative does not fulfill any of the project sponsor's objectives.

6.3 ALTERNATIVE SITE PLAN

As shown in Figure 6-1, the alternative site plan differs from the project site plan in that it includes an additional 1.33-acre parcel along the northwest property boundary. If the project sponsor is successful in obtaining this property, the gas station facility would be relocated to this parcel. Such a move would eliminate land use conflicts associated with the gas station lights for the residents of the Sierra Garden condominium complex. At this location the gas station would be located closer to the top of bank of the creek channel. The difference in distance between the gas station and the top of bank is insignificant given the absence of riparian vegetation and presence of concrete-lined channel banks bordering the project site. Location of the gas station near the Monument Boulevard entrance may alter the circulation pattern for customers of the gas station and for the gas delivery trucks. Without a defined alignment it is difficult to determine whether the new location would provide any beneficial effect in the circulation pattern or create additional impacts. All other impacts identified for the project would remain the same. Development under the Alternative Site Plan would meet the project sponsor's objectives.

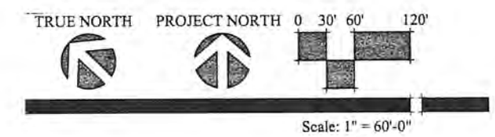


Project Data

CLIENT:	COSTCO WHOLESALE 999 LAKE DRIVE ISSAQUAH, WA. 98027
PROJECT ADDRESS:	MONUMENT BLVD. CONCORD, CA
ZONING:	PLANNED INDUSTRIAL PARK (PI) AND PLANNED DISTRICT (PD)
TOTAL SITE AREA:	25.16 ACRES (1,009,183 S.F.)
TOTAL COSTCO AREA:	17.44 ACRES (759,867 S.F.)
STORE PARCEL:	16.11 ACRES (701,852 S.F.)
GASOLINE PARCEL:	1.33 ACRES (58,015 S.F.)
RESIDUAL PARCEL	5.72 ACRES (249,316 S.F.)
JURISDICTION:	CITY OF CONCORD
SETBACKS:	PROPOSED 10'; 20' ALONG DETROIT
BOUNDARIES INFORMATION:	THIS PLAN HAS BEEN PREPARED BASED ON INFORMATION PROVIDED BY KIER & WRIGHT ENGINEERS, DATED 7-98.

BUILDING DATA:	
COSTCO BUILDING AREA	140,746 S.F.
TIRE CENTER	5,200 S.F.
FOOD SERVICE	1,075 S.F.
RESIDUAL PARCEL BUILDING AREA	86,300 S.F.
TOTAL BUILDING	233,321 S.F.

PARKING DATA:	
COSTCO PARKING PROVIDED:	
(#) 10' WIDE STALLS	688 STALLS
(#) 9' WIDE STALLS	180 STALLS
(#)HC HANDICAP STALLS	16 STALLS
RESIDUAL PARCEL PARKING	118 STALLS
TOTAL PARKING	1,002 STALLS
NO. OF STALLS PER 1000 S.F. OF COSTCO BUILDING AREA:	6.01 STALLS
RATIO OF PARKING STALLS TO S.F. OF INDUSTRIAL BUILDING AREA	1:731



Source: Mulvanny Architects

Figure 6-1 Alternative Site Plan

6.4 ALTERNATIVE SITES

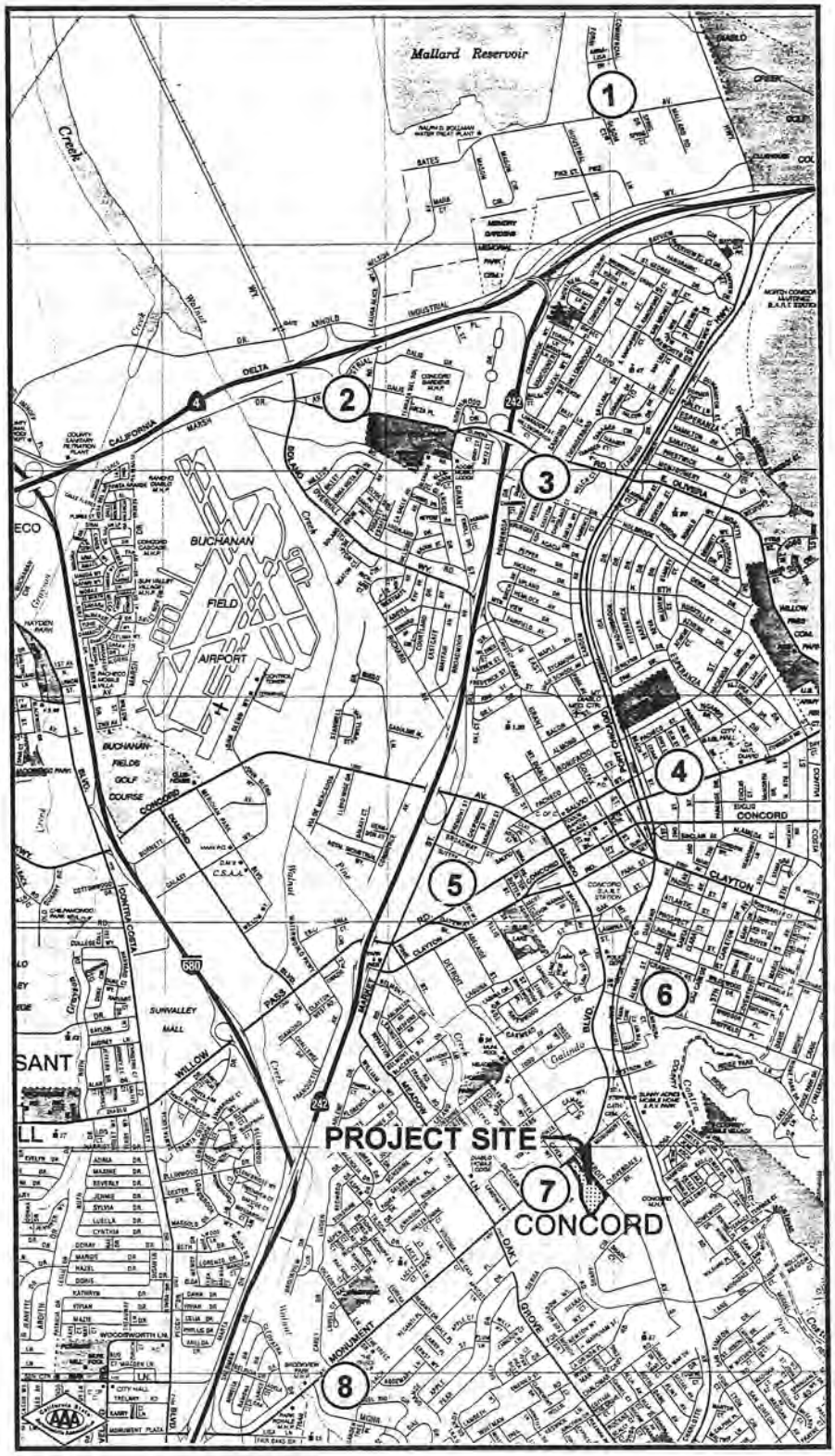
During the scoping meeting for the proposed project several residents stated that a store serving a regional need should be located at another site, preferably near a freeway where easier access would be available and downtown city streets would not be impacted by the additional traffic. Thus, this analysis considers eight alternative sites within the City of Concord where Costco could possibly locate a similar facility. These sites are identified on the Alternative Sites Map, Figure 6-2. Costco representatives have stated that the facility requires a minimum of 15 acres. Since there are not many vacant or underutilized parcels of this size in the City, this analysis also considers other sites where redevelopment could occur. CEQA states that "only locations that would avoid or substantially lessen any of the significant effects of the project need be considered in the EIR." CEQA further states that the alternative site analysis need not take into account whether the project proponent can reasonably acquire, control or have access to the sites. The project sponsor does not own or have an option on any of the sites discussed below. CEQA also states that only alternative sites should be considered if project impacts can be avoided or substantially lessened.

Alternative Site 1: Commercial Circle in North Concord Business Park

A combination of parcels could be formed to total a minimum of 15 acres within the industrial park. Sites are vacant and would be available for developing such a project. The General Plan designation is Industrial/Business Park and a regional facility such as Costco would be appropriate under this designation. It should be noted that a similar use failed near this location.

Located north of State Route 4 within the North Concord Business Park, this location has relatively good access to the freeways. However, based upon the approved project trip distribution patterns only approximately 10 percent of traffic would have convenient access to the site from the freeway. Building a Costco store at this location would translate into congestion for local city streets, which would be used to connect to the Commercial Circle site. This is because the remaining 90 percent of traffic expected to visit the new Costco would be coming from within Concord or Clayton residential areas, which lie south of the Commercial Circle site. Locating the Costco store at this site could impact the following roads: Detroit Avenue, Meadow Lane, Galindo Street, Port Chicago Hwy, Willow Pass Road and Concord Avenue. It would, however, be convenient for persons living outside Concord who use the freeway system; e.g., Pleasant Hill, Walnut Creek, Martinez.

Traffic volumes are expected to be similar to that of the proposed project, although longer trips could be anticipated. Air quality impacts would also be similar as identified in Chapter 4. However, it is likely that congestion would be less at this site, thereby reducing the time cars must idle. Less idling results in fewer emissions polluting the air basin.



ALTERNATIVE SITES

1 COMMERCIAL CIRCLE

2 SOLANO DRIVE-IN

3 GLENBROOK SCHOOL

4 OLYMPIC HIGH SCHOOL

5 PARK 'N' SHOP

6 LOMA VISTA SCHOOL

7 BRUZZONE

8 NAVLET'S

N

Graphic Scale

0 3355' 6710'

Source: Mills Associates

Figure 6-2 Alternative Sites Map

The site is located within the structural height limits zone established for Buchanan Field Airport. Since the building height for the Costco facility does not exceed 35 feet, it is well within the height restrictions established for the zone.

Since there are no noise sensitive receptors in the vicinity of the North Concord Business Park, noise impacts would not be an issue. Noise from the project would be similar to the preferred site.

Visual impacts would be greatly reduced and the size of the building would be compatible to what currently exists in the business park. Because no houses are located in close proximity, light and glare would no longer be an impact unless it interferes with freeway traffic.

Biological and cultural resources are not expected to be any different at this location than at the preferred site. Mitigation measures recommended in the event of unearthing cultural resources would apply to this site as well.

Hazards of the project would be similar to the preferred location—this is not expected to change at the alternative site. Drainage impacts would also be similar to that of the preferred location.

Locating the Costco store at this location from an environmental perspective could be considered a viable alternative to the preferred site. However, when assessing the site in the context of the project sponsor's objectives it would be located in fairly close proximity to the existing facility, thereby not as easily accessible for central county Costco membership as stated in Objective 1. Development at this site also would overlap with the Antioch warehouse trade area which is contrary to Objective 2. Furthermore, it is speculative whether the project sponsor could acquire the acreage in time to open the warehouse by September 2000 as called for in Objective 7.

Alternative Site 2: Solano Drive-In Property

This site consists of approximately 12 acres which is not adequate to accommodate the Costco facility. The site is designated Industrial/Business Park in the General Plan. A Costco facility would be appropriate under this designation; however, this site is too small to be considered as a viable alternative to the preferred site.

Alternative Site 3: Glenbrook School

This site is located within a residential neighborhood and is designated in the General Plan as Public/Quasi-Public. A General Plan Amendment would be required to permit a Costco facility. The size of the site is 8.2 acres and would be too small to accommodate the project.

Alternative Site 4: Olympic High School Site

This site could accommodate the Costco facility as it is approximately 16.5 acres. However, like the Glenbrook School Site, it is designated in the General Plan as Public/Quasi-Public and would require a General Plan Amendment.

Development of a Costco facility at this site would create many more significant impacts than at the preferred site. The school is located within a residential neighborhood and impacts associated with traffic, noise and light/glare would be significantly worse than at the preferred site because of the number of residences in the area surrounding the school site. Policy 17.1.5 of the City's General Plan states that surplus school sites would be suitable for housing opportunities and/or as potential recreational/open space areas. The City can consider other uses for the school sites. However, such uses must be compatible with neighboring land uses, particularly the surrounding residential development. A Costco facility would not be compatible. This site should not be considered as a viable alternative to the preferred site.

Alternative Site 5: East End of Park 'n' Shop Center (Levitz Building and Adjoining Buildings)

The Park 'n' Shop location consists of 7.5 acres and is designated in the General Plan as Regional Commercial. This would be an appropriate location for the Costco facility insofar as complying with the General Plan. However, the acreage is not adequate nor is the site configured as such to accommodate the Costco facility. Thus, this site cannot be considered as a viable alternative.

Alternative Site 6: Loma Vista and Crawford Village Elementary School Sites

Like the previously discussed school sites, this school site is also located in a residential neighborhood. These two sites combined contain 12 acres of playfield that the school district has considered as surplus property. Existing buildings are used for adult education, child care or special education classes. The sites are designated in the General Plan as Public/Quasi-Public. A General Plan Amendment would be required if the project were to be considered at this location. General Plan Policy 17.1.5 also applies to this site. Because of its size, location in a residential neighborhood and its current General Plan designation, this site is not considered as a viable alternative to the preferred site.

Alternative Site 7: Bruzzone Property Adjacent to the Project Site

The Bruzzone site contains approximately 15.7 acres and is designated in the General Plan as Neighborhood/Community Commercial. This designation is generally not intended to accommodate large, warehouse-type facilities and the scale of buildings must fit in with the neighborhood or surrounding community character. Although the site is large enough, it has a greater length of frontage adjacent to residential development. Because of the close proximity to the residential units along the southern property line, greater impacts could occur which could require greater mitigation for light/glare and noise impacts. Also, locating the store on this site could preclude a future road alignment from Detroit Avenue. Access to the site would have to be from Oak Grove Road. Because of the land use compatibility issues and the required General Plan Amendment, this site is not considered a viable alternative to the preferred site.

Alternative Site 8: Navlet's Nursery

The Navlet's Nursery site is located on Monument Boulevard fairly close to the freeway on-/off-ramps. The site encompasses approximately 7.5 acres and is designated in the General Plan as Community Office overlaid with the High Density Residential designation. It would require a General Plan Amendment. Residential development abuts the site on its south, southeast and easterly border and potential land use conflicts could occur. Due to the size of this site, the need to amend the General Plan, and land use conflicts with adjacent residences, this is not a viable alternative to the preferred site.

Summary

Based upon the above discussion, the only alternative site suitable for development of a Costco facility is the North Concord Business Park. This site would have fewer impacts on surrounding land uses and be compatible with other uses in the business park. However, the site is isolated, lacks visibility, is not centrally located and would overlap with the Antioch Costco facility trade area.

6.5 DEVELOPMENT AS INDUSTRIAL/BUSINESS PARK

The General Plan designation for the site is either Regional Commercial or Industrial/Business Park. A possible alternative to the project would be the development of the site as a light industrial or business park. Depending upon the types of uses that would be developed under this alternative, the impacts could be similar or greatly reduced. It is assumed that traffic volumes would be less, thereby reducing vehicle emissions. Opportunities to reduce air emissions could be considered under this scenario because workers could car pool, utilize mass transit, ride bikes or walk to work, unlike the proposed project where people depend upon their vehicle to transport goods purchased at Costco. Noise impacts could occur, depending upon the type of use that may be located in close proximity to the Sierra Garden condominiums and the type of mechanical equipment that is housed on the building exterior. Light and glare would be lessened, particularly if the parking lot is located in the central part of the site and buildings abut the site perimeter. Light poles would not be as high and the wattages could be less for a business park parking lot. This could be less of an impact on adjoining residences. Impacts associated with drainage, biological resources, cultural resources and hazards would be similar to that of the proposed project. A business park at this location would not have the visual impact of the Costco facility and would be more in keeping with the size of the buildings at the adjacent business park. However, this type of development does not meet the objective of the project proponent to construct a commercial bulk retail facility.

6.6 ENVIRONMENTALLY SUPERIOR ALTERNATIVE

The environmentally superior alternative would be to develop the site as a industrial/business park, similar to Shary Circle. Allowing an industrial/business park may not have as many adverse impacts as identified for the project. Traffic volumes could be less and alternative modes of transportation could be available, thereby reducing air quality impacts. Noise levels could be

worse depending upon the location of buildings, type of activity and location of exterior mechanical equipment in proximity to the Sierra Garden condominiums. However, care can be taken in developing a site plan that considers these factors to ensure adjoining residences are not impacted. A business park could be structurally and architecturally compatible with the adjoining land uses. However, as stated above, developing the site as an industrial/business park would not meet project objectives and could require transportation improvements such as road widening and signalization.

Alternatively, relocating the Costco facility could be environmentally superior to the project site. As stated above, the alternative site is located in North Concord within an industrial/business park. As such, a Costco facility would be permitted under this designation. The impacts of land use compatibility would be eliminated since there are no sensitive land uses located within the North Concord Business Park. Traffic impacts would be similar to that of the project site. The amount of runoff created by the Costco facility would not change. Existing storm drain systems would need to be assessed to determine whether adequate capacity exists. However, locating the Costco facility would not meet many of the project sponsor's objectives, is not centrally located, lacks visibility, and would overlap with the Antioch Costco facility trade area.

7
REPORT PREPARATION

7
REPORT PREPARATION

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Ron Zeiger, Zeiger Engineers, Inc.

APPENDICES

A. INITIAL STUDY CHECKLIST

City of Concord
Community Development Department
Planning Division
1950 Parkside Drive
Concord, CA 94519
(925) 671-3152

Initial Environmental Impact Analysis

1. Project title: Costco Wholesale Development

2. Lead agency name and address: City of Concord, 1950 Parkside Drive, Concord, CA 94519

3. Contact persons: Project - CEQA Compliance – Brian Dolan (925) 671-3369

4. Project location: Near the southwest intersection of Monument Boulevard and Detroit Avenue, Concord, California

5. Project Sponsor' Name and Address: Costco Wholesale, 999 Lake Drive, Issaquah, Washington 98027

6. General plan designation: Regional Commercial (RC)

7. Zoning: PD (Planned District) and PI (Planned Industrial)

8. Description of project:

The Preliminary Development Plan (PDP) application is for the construction of a 147,021 s.f. commercial bulk retail facility containing a tire center and food court on a site totaling 21.68 acres. Project plans call for a three-island gas station, with two double-sided gasoline dispensers each that are fully automated and self-serving for Costco members only. The three-island gas facility is located in the southwestern corner of the property. The total area of the Costco warehouse, including the parking area, encompasses 15.95 acres of the 21.68-acre site. The remaining 5.72 acres would be available to accommodate additional commercial buildings totaling up to approximately 90,000 square feet. (The Conceptual Site Plan shows five buildings totaling 86,300 square feet.) Access to the project is from Monument Boulevard and Detroit Avenue. The Preliminary Development Plan applies to parcels APN 129-030-035, 129-030-014, 129-030-007, 129-030-027, 129-040-007. APN 129-040-004 and 129-040-007 contain the remaining 5.72 acres that will be developed in the future.

The applicant may purchase an additional 1.49 acres abutting the westerly property line behind the adjacent storage facility west of the site on Monument Boulevard. If the purchase is completed, the three-island gas station would be placed at this location. The EIR will evaluate this option as one of the alternatives to the project.

The Rezoning application requests a rezoning of 18.19 acres from PI to PD. This includes parcels 129-030-014, 129-030-007, 129-030-027, 129-040-004 and 129-040-007.

9. Surrounding land uses and setting:

A small portion of the site fronting on Monument Boulevard (3.52 acres) presently contains a recreational vehicle sales operation. The remainder of the site is vacant and generally flat. It contains some trees such as redwood, walnut, juniper, Monterey pine and elm. Pine/Galindo Creek forms the site's westerly boundary. This segment of the creek is contained within a concrete channel.

EVALUATION OF ENVIRONMENTAL IMPACTS:

De Minimis Fish and Wildlife Resource Findings for Urbanized Sites
This project will not individually or cumulatively have an adverse effect on wildlife resources, as defined in Section 711.2 of the Fish and Game Code, because the site:

A. does not have a stream bed, riparian vegetation, or species of special concern, and

B. is a previously urbanized site which is maintained in a manner which makes it unsuitable for wildlife, and

C. is surrounded by urban development on all sides.

ENVIRONMENTAL IMPACTS:

	Potentially Significant Impact	*Potentially Significant Unless Mitigation Incorporated*	*Less than Significant Impact*	*No Impact*
I. LAND USE PLANNING. *Would the proposal:*				
a. Conflict with General Plan designation or zoning? (Source #: City of Concord General Plan, 1994)	___	___	___	X
b. Conflict with applicable environmental plans or policies adopted by agencies with jurisdiction over the project?	___	X	___	___
c. Be incompatible with existing land use in the vicinity?	___	X	___	___
d. Disrupt or divide the physical arrangement of an established community (including a low-income or minority community)?	___	___	___	X

Discussion: a) The project would comply with the General Plan designation; the rezoning request would allow for the entire site to be planned and is consistent with the zoning in the area. b) The EIR will evaluate whether the proposed project conflicts with Concord General Plan Policy 14.6.1 relating to design excellence along Monument Boulevard and Objective 14.7 relating to the livability of residential areas in proximity to Monument Boulevard. c) The proposed commercial use is compatible with other commercial land uses along Monument Boulevard and Detroit Avenue, although the size of the facility will be larger than what presently exists along these two streets. Incompatible land uses may occur as a result of increased noise levels for residents of the multi-family development located southwest of the site. d) The project would not disrupt or divide the physical arrangement of an established community. Uses are mixed in the area - single family neighborhoods are located in the project vicinity but are separated from the project site by the commercial and light industrial uses.

II. POPULATION AND HOUSING. *Would the proposal:*				
a. Cumulatively exceed official regional or local population projections?	___	___	___	X
b. Induce substantial growth in an area directly or indirectly (e.g., through projects in an undeveloped area or extension of major infrastructure)?	___	___	___	X
c. Displace existing housing, especially affordable housing?	___	___	___	X

Discussion: a-b) The proposed project would not induce population, thus local population projections would not be exceeded. c) The site is primarily vacant (with the exception of the recreational vehicle sales operation) and would not displace existing housing.

	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less than Significant Impact	No Impact
d. Disruptions to the drainage pattern of the site during or after construction (i.e., increase in impervious area, removal of vegetation, etc.)?	—	X	—	—
e. Discharge of urban runoff pollutants from residential, commercial or industrial activity (e.g., sediment from construction, hydrocarbons and metals from vehicle use, nutrients and pesticides from landscape maintenance, metals and acidity from mining operations)?	—	X	—	—
f. Changes in the amount of surface water in any water body or wetland?	—	X	—	—
g. Changes in currents, or the course or direction of water movements, in either marine or fresh water or wetlands?	—	—	—	X
h. Change in the quantity of ground waters, either through direct additions or withdrawals, or through interception of an aquifer by cuts or excavations or through substantial loss of groundwater recharge capability?	—	—	—	X
I. Altered direction or rate of flow of groundwater?	—	—	—	X
j. Impacts to groundwater quality through infiltration of reclaimed water or stormwater runoff that has contacted pollutants from urban, industrial or agricultural activities?	—	—	—	X
k. Alterations of wetlands in any way?	—	—	—	X
l. Substantial reduction in the amount of groundwater otherwise available for public water supplies?	—	—	—	X

Discussion: a) Development of the site will change the absorption rates, drainage patterns and the amount of surface runoff due to the increase in impervious surface area. Drainage from the site will be collected and conveyed to the nearest offsite storm drain. The project's impact on the local drainage system will be addressed in the EIR. Furthermore, project drainage plans will be reviewed by the City Engineer for compliance. b) The site is not located within a FEMA flood zone. c) The site drainage will be conveyed to the nearest adequate downstream storm drain. It will not be directly discharged into surface waters. d) Site preparation and grading will disrupt the existing drainage pattern until the new drainage system is constructed. As site improvements are constructed the drainage system will be conveyed to the nearest adequate down stream storm drain. As discussed in (a) above, the drainage pattern will be altered with development of the site. This will be addressed in the EIR and typical urban pollutants associated with this type of project will be identified. e) The project will cause an increase in the amount of urban pollutants entering the storm drain system. The EIR will describe the type and quantity of those pollutants and will recommend measures to reduce those impacts. f) The downstream effect of the runoff created by the increase in impervious surface will be evaluated in the EIR. The potential increase in surface water could potentially effect downstream wetlands. g). Pine/Galindo Creek at this location is a concrete channel - direction of flow or currents would not change. h) There are no identified plans for withdrawal or interception of ground waters. i) Depth of grading is not expected to directly affect groundwater flows or direction. j) Site runoff will be collected and conveyed to a storm drain system thereby eliminating the potential to contaminate groundwater sources. k) There are no wetlands near or on the site. l) The local water supply is not obtained from local groundwater sources.

V. AIR QUALITY. *Would the proposal:*

a. Violate any Bay Area Air Quality Management District, Federal Clean Air Act, or State of California air quality standard or contribute to an existing or projected air quality violation?	—	X	—	—
b. Expose sensitive receptors to pollutants?	—	—	—	X

	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less than Significant Impact	No Impact
b. Locally designated species (e.g., heritage trees)?	___	X	___	___
c. Locally designated natural communities (e.g., oak savannah, grasslands, etc.)?	___	___	___	X
d. Wetland habitat (e.g., marsh, riparian, and vernal pool)?	___	___	___	X
e. Wildlife dispersal or migration corridors?	___	___	___	X

Discussion: a) It is conceivable that an endangered, threatened or rare species could inhabit the project site, although the site is not known to be a significant habitat due to its location in an urbanized area. However, as a part of the EIR, a survey will be conducted to determine whether any listed species occupy the site. b) Seven heritage trees are located on the site - all of them would be removed to allow for the project. This will be analyzed in the EIR. c) No known locally designated natural communities occupy the site. d) There is no wetland habitat on the site. e) The site is located in an urbanized area and does not provide a wildlife corridor.

VIII. ENERGY AND MINERAL RESOURCES. *Would the proposal:*

a. Conflict with State of California energy conservation requirements?	___	___	___	X
b. Use nonrenewable resources in a wasteful and inefficient manner?	___	___	___	X
c. Result in the loss of availability of a known mineral resource that would be of future value to the region and the residents of the State?	___	___	___	X

Discussion: a) The structure will be equipped with required energy efficient devices as regulated by the building code. b) Nonrenewable resources would be used in the construction of the project. c) There are no known mineral resources located on the project site.

IX. HAZARDS. *Would the proposal involve:*

a. A risk of accidental explosion or release of hazardous substances (including, but not limited to, oil, pesticides, chemicals, or radiation)?	___	___	X	___
b. Possible interference with emergency response policies or practices, or other impact on the community's ability to respond to an emergency (e.g., loss of a public school could result in loss of emergency shelter.)?	___	___	___	X
c. The creation of any health hazard or potential health hazard?	___	___	___	X
d. Exposure of people to existing sources of potential health hazards?	___	___	___	X
e. Increased fire hazard in areas with flammable brush, grass, or trees?	___	___	___	X

	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less than Significant Impact	No Impact
b. Communications systems?				X
c. Local or regional water treatment or distribution facilities?				X
d. Sewer or septic tanks?				X
e. Storm water drainage or storm water quality control?		X		
f. Solid waste disposal?				X
g. Water sources?				X

Discussion: a-d, f-g) Utility systems will be able to serve the project. e) The EIR will address the impacts upon the storm drainage system. Applicant will be required to obtain an NPDES permit.

XIII. AESTHETICS. *Would the proposal:*

a. Affect a scenic vista or scenic highway?				X
b. Have a demonstrable negative aesthetic effect?		X		
c. Result in light or glare intrusion on neighboring properties, public facilities, aircraft landing approaches, or transportation rights-of-way?		X		

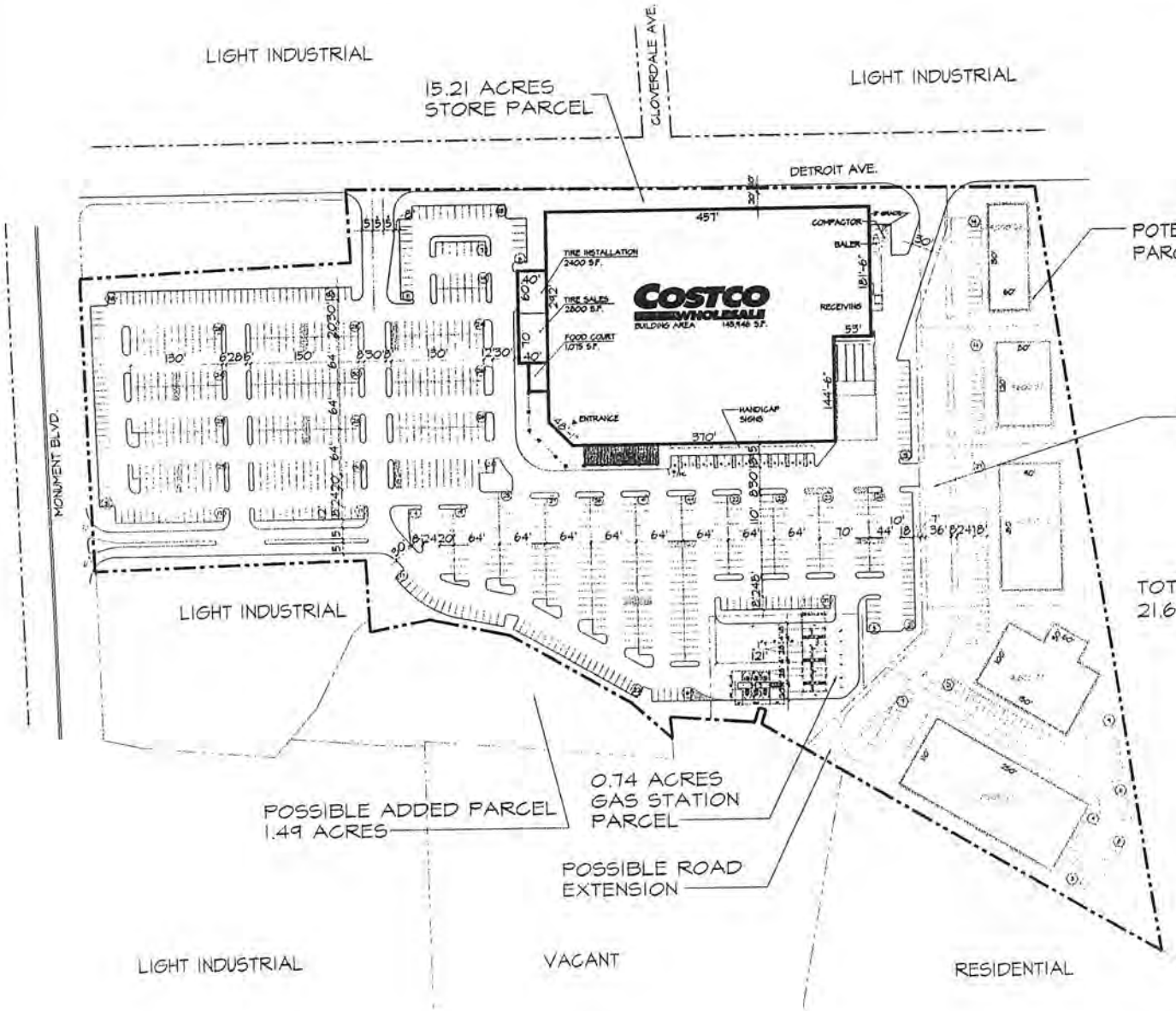
Discussion: a) The project site is not located along a scenic corridor and would not affect distant views of scenic vistas (Mt. Diablo). B) The proposed project is much larger than commercial buildings in the vicinity. The boxy façade with little architectural relief could create a negative aesthetic effect when seen from roadways and the multi-family housing southwest of the site. The compatibility of the new structure with the surrounding setting will be evaluated in the EIR and through the design review process. C) Exterior lights will be spaced intermittently throughout the parking lot as well as on the building's exterior. The lighting plan will be assessed in the EIR and during the design review process.

XIV. CULTURAL RESOURCES. *Would the proposal:*

a. Disturb paleontological resources?				X
b. Disturb archaeological resources?		X		
c. Have the potential to cause a physical change which would affect buildings, structures or objects which are historically significant to the community?				X

Discussion: a) and c) There are no known paleontological or historic resources on the site. b) There are no known archaeological resources on the site. However, native american villages in the area are to have been located near fresh water sources such as the creek. Because the site is adjacent to Galindo Creek it has the potential to contain undiscovered archaeological resources. The EIR will evaluate the potential impacts of proposed grading on the site on I archaeological resources that may exist on the site and will identify appropriate mitigation measures to offset identified impacts.

Concept Site Plan



Project Data

CLIENT:	COSTCO WHOLESALE 999 LAKE DRIVE ISSAQUAH, WA. 98027
PROJECT ADDRESS:	MONUMENT BLVD. CONCORD, CA
ZONING:	PLANNED INDUSTRIAL PARK (PI) AND PLANNED DISTRICT (PD)
TOTAL SITE AREA:	21.68 ACRES (944,381 S.F.)
TOTAL COSTCO AREA:	15.95 ACRES (694,850 S.F.)
STORE PARCEL:	15.21 ACRES (662,558 S.F.)
GASOLINE PARCEL:	0.74 ACRES (32,292 S.F.)
RESIDUAL PARCEL	5.72 ACRES (249,268 S.F.)
JURISDICTION:	CITY OF CONCORD
SETBACKS:	PROPOSED 10'; 20' ALONG DETROIT
BOUNDARIES INFORMATION:	THIS PLAN HAS BEEN PREPARED BASED ON INFORMATION PROVIDED BY KIER & WRIGHT ENGINEERS, DATED 7-98.

BUILDING DATA:

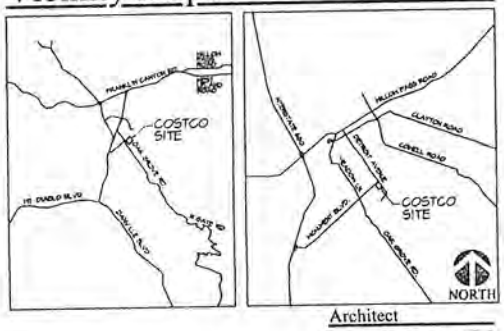
COSTCO BUILDING AREA	140,746 S.F.
TIRE CENTER	5,200 S.F.
FOOD SERVICE	1,015 S.F.
RESIDUAL PARCEL BUILDING AREA	86,300 S.F.
TOTAL BUILDING	233,321 S.F.

PARKING DATA:

COSTCO PARKING PROVIDED:	
(B) 10' WIDE STALLS	664 STALLS
(B) 9' WIDE STALLS	184 STALLS
(B) HANDICAP STALLS	16 STALLS
RESIDUAL PARCEL PARKING	118 STALLS
TOTAL PARKING	981 STALLS
NO. OF STALLS PER 1000 S.F. OF COSTCO BUILDING AREA:	5.95 STALLS
RATIO OF PARKING STALLS TO S.F. OF INDUSTRIAL BUILDING AREA	1:731

NOTES:
EXISTING CONDITIONS TO BE FIELD VERIFIED.

Vicinity Maps



Architect

MULVANNY
PARTNERSHIP
ARCHITECTS PS

TRUE NORTH PROJECT NORTH 0 30' 60' 120'

Scale: 1" = 60'-0"

Costco Wholesale

CONCORD, CALIFORNIA

PROJ. NO. 98-203 A
CONCEPT SITE PLAN 1-26-99
CONCORD, CA

DD1.2

B. Mitigation Monitoring Program

MITIGATION MONITORING PLAN
(For Significant Impacts only)

Mitigation Measure	Person/Agency Responsible for Mitigation	Monitoring Requirements	Person/Agency Responsible for Monitoring	Timing or Frequency of Monitoring
LAND USE AND LAND USE COMPATIBILITY				
4.1-1A: The project sponsor shall revise project plans to include additional trellises along the eastern wall to the left and right of the middle section where two trellises are currently proposed.	Project Sponsor	Confirm revision to landscape plan incorporating additional trellises on eastern wall	City Planning Division	Prior to use permit approval
4.1-1B: The project sponsor shall incorporate additional architectural treatment or landscaping on the southern and western elevations where large expanses of blank wall are visible. This can include the use of trellises, the planting of additional trees next to the building, or scoring the concrete and painting the wall with a darker tone.	Project Sponsor	Confirm revision of plans for southern and western elevations incorporating the use of trellises, planting of additional trees, or addition of architectural treatment	City Planning Division	Prior to use permit approval
4.1-2: The project sponsor shall reduce the wattage of the parking lot lights as well as install shorter light standards that do not exceed 30 feet. Two, 400-watt bulbs could be used on 30-foot-tall light poles.	Project Sponsor	Confirm that appropriate reductions in wattage and pole height have been made on lighting plan. Conduct on-site inspection	City Planning Division City Planning Division	Review plan prior to use permit approval Prior to issuance of occupancy permit
4.1-3A: The project sponsor shall ensure that the following measures are included in construction contracts to control fugitive dust emissions during demolition of existing structures: • Water during demolition of structures and break-up of pavement to control dust generation. • Cover all trucks hauling demolition debris from the site.	Project Sponsor/Contractor	Confirm submittal of dust control plan Conduct site visits to confirm plan's implementation	City Current Development Division City Construction Division	Prior to issuance of grading permit Daily inspections during demolition

Mitigation Measure	Person/Agency Responsible for Mitigation	Monitoring Requirements	Person/Agency Responsible for Monitoring	Timing or Frequency of Monitoring
4.1-3B: The project sponsor shall ensure that the following measures are included in construction contracts to control fugitive dust emissions during grading and site preparation activities: • Water all active construction areas at least twice daily and when necessary. Active areas adjacent existing land uses shall be kept damp at all times, or shall be treated with non-toxic stabilizers or dust palliatives. • Cover all trucks hauling soil, sand, and other loose materials or require all trucks to maintain at least two feet of freeboard. • Pave, apply water three times daily, or apply (non-toxic) soil stabilizers on all unpaved access roads, parking areas and staging areas at construction sites. • Sweep daily (preferably with water sweepers) all paved access road, parking areas and staging areas at construction sites. • Sweep streets daily (preferably with water sweepers) if visible soil material is carried onto adjacent public streets. • Hydroseed or apply non-toxic soil stabilizers to inactive construction areas. • Enclose, cover, water twice daily or apply non-toxic soil binders to exposed stockpiles (dirt, sand, etc.). • Limit traffic speeds on unpaved roads to 15 mph. • Install tire grates at the site exits to avoid tracking mud from the site onto City streets. • Install sandbags or other erosion control measures to prevent silt runoff to public roadways.	Project Sponsor/Contractor	Confirm submittal of dust control plan Conduct site visits to confirm plan's implementation	City Construction Division City Construction Division	Prior to issuance of grading permit Inspections twice per week during grading operation

Mitigation Measure	Person/Agency Responsible for Mitigation	Monitoring Requirements	Person/Agency Responsible for Monitoring	Timing or Frequency of Monitoring
4.1-3C: The project sponsor shall prepare and implement a noise attenuation plan that will include the following measures: • Limit construction activity between the hours of 7:00 a.m. and 6:00 p.m. with no construction activity on Sundays or holidays without prior written approval by the Chief of Planning. • Maintain and muffle all construction equipment powered by internal combustion engines. • Identify construction equipment staging areas that are 200 feet from residential units.	Project Sponsor/Contractor	Confirm submittal of noise attenuation plan that addresses: construction hours, use of muffled equipment, and staging of equipment Conduct site inspection to confirm compliance with plan	City Construction Division City Construction Division	Prior to issuance of grading permit Periodically during construction
DRAINAGE				
4.2-1: The project sponsor shall prepare a drainage plan and calculations demonstrating that there shall be no increase in either the rate or total volume of runoff from the project site into the existing storm drain systems along the site's east and west boundaries unless it can be demonstrated that sufficient capacity exists to accommodate the increased runoff. This can be accomplished with either previously prepared drainage studies or by a new study prepared by the project sponsor, in accordance with City design criteria.	Project Sponsor	Review drainage plan and associated calculations	City Construction Division	Prior to issuance of grading permits
4.2-2: The project's central drainage system shall extend to Detroit Avenue, in the vicinity of Cloverdale Avenue. It shall have sufficient capacity to accommodate the runoff from the Cloverdale Avenue neighborhood, as defined by the City Engineering and Transportation Department, and it shall be routed through a drainage easement that grants the City all required access rights.	Project Sponsor	Confirm preparation of storm drain design	City Construction Division	Prior to issuance of grading permits

Mitigation Measure	Person/Agency Responsible for Mitigation	Monitoring Requirements	Person/Agency Responsible for Monitoring	Timing or Frequency of Monitoring
4.2-3: The pipe connection into the Pine Creek channel and all associated modifications of the existing channel walls shall be constructed in accordance with design requirements set forth by the Flood Control District.	Project Sponsor	Confirm preparation of design in accordance with all applicable County Flood Control and Water Conservation District design guidelines Perform field check during construction	Flood Control District and City Construction Division City Construction Division	Prior to issuance of grading permit Inspect periodically during construction
4.2-4: The project sponsor shall prepare a Storm Water Pollution Prevention Plan to control erosion on the project site during construction.	Project Sponsor	Confirm preparation of SWPPP and approval by RWQCB City to field check implementation of plan	RWQCB and City Construction Division City Construction Division	Prior to issuance of grading permit Periodically during construction
4.2-5A: The project sponsor shall prepare a plan for regular maintenance and long-term implementation of its Clean Water Program responsibilities, for approval and monitoring by the City Engineering and Transportation Department.	Project Sponsor	Confirm preparation of long-term SWPPP maintenance plan Confirm implementation of long-term SWPPP maintenance plan with on-site inspections	City Construction Division City Construction Division	Prior to issuance of grading permit Inspect as needed thereafter
4.2-5B: The drainage system and site plan shall be configured to provide infiltration areas throughout the project to capture the "first flush" of storm water runoff, in accordance with the recommendations set forth in the Bay Area Stormwater Management Agencies Association "Start at the Source" design guidance manual.	Project Sponsor	Confirm location of infiltration areas on site plan Conduct periodic inspections	City Construction Division City Construction Division	Prior to issuance of grading permit Inspect as needed thereafter

Mitigation Measure	Person/Agency Responsible for Mitigation	Monitoring Requirements	Person/Agency Responsible for Monitoring	Timing or Frequency of Monitoring
AIR QUALITY				
4.3-1A: The project sponsor shall ensure that the following measures are included in construction contracts to control fugitive dust emissions during demolition of existing structures: • Water during demolition of structures and break-up of pavement to control dust generation. • Cover all trucks hauling demolition debris from the site.	Project Sponsor/Contractor	Confirm submittal of dust control plan Conduct site visits to confirm plan's implementation	City Construction Division City Construction Division	Prior to issuance of grading permit Daily inspections during demolition
4.3-1B: The project sponsor shall ensure that the following measures are included in construction contracts to control fugitive dust emissions during grading and site preparation activities: • Water all active construction areas at least twice daily and when necessary. Active areas adjacent existing land uses shall be kept damp at all times, or shall be treated with non-toxic stabilizers or dust palliatives. • Cover all trucks hauling soil, sand, and other loose materials or require all trucks to maintain at least two feet of freeboard. • Pave, apply water three times daily, or apply (non-toxic) soil stabilizers on all unpaved access roads, parking areas and staging areas at construction sites.	Project Sponsor/Contractor	Confirm submittal of dust control plan Conduct site visits to confirm plan's implementation	City Construction Division City Construction Division	Prior to issuance of grading permit Inspections twice per week during grading operation

Mitigation Measure	Person/Agency Responsible for Mitigation	Monitoring Requirements	Person/Agency Responsible for Monitoring	Timing or Frequency of Monitoring
4.3-1B ***(continued)*** • Sweep daily (preferably with water sweepers) all paved access road, parking areas and staging areas at construction sites. • Sweep streets daily (preferably with water sweepers) if visible soil material is carried onto adjacent public streets. • Hydroseed or apply non-toxic soil stabilizers to inactive construction areas. • Enclose, cover, water twice daily or apply non-toxic soil binders to exposed stockpiles (dirt, sand, etc.). • Limit traffic speeds on unpaved roads to 15 mph. • Install tire grates at the site exits to avoid tracking mud from the site onto City streets. • Install sandbags or other erosion control				
TRANSPORTATION/CIRCULATION				
4.4-1: The project sponsor shall install signals at the Detroit Avenue/Whitman Road intersection since the signal would not be needed without the project.	Project Sponsor	Review and approve the design and installation of traffic signal in accordance with City standards	City Transportation Division	Prior to issuance of occupancy permit for the store and gas station
4.4-2: The project sponsor shall extend the existing left-turn lane at the westbound approach to the intersection of Monument Boulevard and Detroit Avenue to 250 feet, provide an additional left-turn lane of the same length, and adjust the signal timing to eight-phase to provide protected left-turn phases.	Project Sponsor	Review and approve the design for extension of left-turn lane, adding an additional left-turn lane and adjusting the signal timing in accordance with City standards	City Transportation Division	Prior to issuance of occupancy permit for the store and gas station
		Inspect construction of traffic lane and signal improvements	City Transportation Division	Prior to issuance of occupancy permit for the store and gas station

Mitigation Measure	Person/Agency Responsible for Mitigation	Monitoring Requirements	Person/Agency Responsible for Monitoring	Timing or Frequency of Monitoring
4.4-3A: The project sponsor shall install a traffic signal at the main entrance to the project site.	Project Sponsor	Review and approve the design and installation of traffic signal in accordance with City standards	City Transportation Division	Prior to issuance of occupancy permit for the store and gas station
4.4-3B: The project sponsor shall be required to provide parking on site to the impacted businesses equal to the number of parallel parking stalls eliminated on Detroit Avenue.	Project Sponsor	Confirm installation of signage restricting the appropriate number of parking spaces for use by businesses on Detroit Avenue	City Transportation Division	Prior to issuance of occupancy permit for the store and gas station
4.4-4: The project sponsor shall install signals at the Detroit Avenue/Whitman Road intersection since the signal would not be needed without the project.	Project Sponsor	Review and approve the design and installation of the traffic signal in accordance with City standards	City Transportation Division	Prior to issuance of occupancy permit for the store and gas station
4.4-5: The project sponsor shall extend the existing left-turn lane at the westbound approach to the intersection of Monument Boulevard and Detroit Avenue to 250 feet, provide an additional left-turn lane of the same length, and adjust the signal timing to eight-phase.	Project Sponsor	Review and approve the design for extension of left-turn lane, adding an additional left-turn lane and adjusting the signal timing in accordance with City standards	City Transportation Division	Prior to issuance of occupancy permit for the store and gas station
		Inspect construction of traffic lane and inspect signal improvements	City Transportation Division	Prior to issuance of occupancy permit for the store and gas station
BIOLOGICAL RESOURCES				
4.5-2A: Prior to the initiation of any grading or land clearing in areas that could drain to Pine Creek, the project sponsor shall prepare and implement a Storm Water Pollution Prevention Plan (SWPPP). This plan shall be consistent with the applicable requirements of Contra Costa County's non-point source NPDES program. The plan should prevent the movement of sediment from the upland areas subject to construction into the off-site Pine Creek.	Project Sponsor	Confirm preparation of SWPPP and approval by Regional Water Quality Control Board	Regional Water Quality Control Board and City Construction Division	Prior to issuance of grading permit
		City to field check implementation of plan	City Construction Division	Field checks periodically during construction
4.5-2B: Any topsoil to be stockpiled shall be located in areas on the site where runoff to Pine Creek will not occur.	Project Sponsor	Approve suitable stockpile locations	City Construction Division	Prior to issuance of grading permit
		Inspect suitable stockpile locations	City Construction Division	Periodic on-site inspections during grading

Mitigation Measure	Person/Agency Responsible for Mitigation	Monitoring Requirements	Person/Agency Responsible for Monitoring	Timing or Frequency of Monitoring
4.5-2C: Equipment storage and staging areas shall be located in disturbed areas or areas within the development envelope where runoff to Pine Creek will not occur.	Project Sponsor	Approve locations of staging areas Inspect locations of staging areas	City Construction Division City Construction Division	Prior to issuance of grading permit Periodic on-site inspections
4.5-2D: Fueling and maintenance of equipment shall be conducted in the northeast corner of the project site or along the Detroit Avenue corridor to prevent any leakage or runoff into Pine Creek.	Project Sponsor	Approve location for fueling/ maintenance of equipment Inspect location for fueling/ maintenance of equipment	City Construction Division City Construction Division	Prior to issuance of grading permit Periodic on-site inspections
4.5-4: A biological survey of the buildings to be demolished and all trees on site shall be conducted by a qualified wildlife biologist no more than 30 days prior to construction to determine if nests of protected bird and special-status bat species' roosting sites are present on site. If active nests or roosts are present, recommendations on construction buffers, scheduled removal of the trees and/or buildings shall be developed and any other protective measures will be made. These measures would require the approval of California Department of Fish and Game. Once the measures have been approved by the California Department of Fish and Game, they will be implemented.	Project Sponsor	Hire wildlife biologist to be paid by project sponsor Confirm completion of survey by wildlife biologist	City Planning Division California Department of Fish and Game and City Planning Division	60 days prior to start of site preparation activities 30 days prior to start of site preparation activities
4.5-5A: The project sponsor shall install oil/grease separators in the storm drain system for the parking lot and developed area to prevent the runoff of oil and grease into Pine Creek.	Project Sponsor	Confirm location of oil/grease separators on drainage plans Inspect location of oil/grease separators	City Construction Division City Construction Division	Prior to issuance of grading permit During construction
4.5-5B: The project sponsor shall prepare and implement a containment plan for the gas station site that will result in the prevention of runoff of any gas or gas station pollutants into Pine Creek.	Project Sponsor	Inspect plans for gas station runoff containment Field check during construction	City Construction Division City Construction Division	Prior to issuance of building permits During construction
NOISE				
4.7-2: The use of leaf blowers shall be restricted to the hours of 7:00 a.m. to 6:00 p.m., Monday through Saturday.	Project Sponsor	Confirm submittal of a noise attenuation plan identifying hours of parking lot cleanup	City Planning Division	Prior to issuance of occupancy permit

Mitigation Measure	Person/Agency Responsible for Mitigation	Monitoring Requirements	Person/Agency Responsible for Monitoring	Timing or Frequency of Monitoring
4.7-3: A noise study shall be conducted for the residual property to determine potential noise impacts associated with the future development of buildings and necessary mitigation measures to reduce noise levels below City standards.	Future Project Sponsor	Hire noise consultant to be paid by future project sponsor Confirm preparation of noise study	City Planning Division City Planning Division	Prior to start of environmental review process During environmental review process for development of residual property
4.7-5: The project sponsor shall prepare and implement a noise attenuation plan that will include the following measures: • Limit construction activity between the hours of 7:00 a.m. and 6:00 p.m. with no construction activity on Sundays or holidays without prior written approval by the Chief of Planning. • Maintain and muffle all construction equipment powered by internal combustion engines. • Identify construction equipment staging areas that are 200 feet from residential units.	Project Sponsor/Contractor	Confirm submittal of noise attenuation plan that addresses: construction hours, use of properly muffled equipment, and staging of equipment Conduct site inspection to confirm compliance with plan	City Construction Division City Construction Division	Prior to issuance of grading permit Periodically during construction
VISUAL QUALITY/AESTHETICS				
4.8-1A: The project sponsor shall revise project plans to include additional trellises along the eastern wall to the left and right of the middle section where two trellises are currently proposed.	Project Sponsor	Confirm revision to landscape plan incorporating additional trellises on eastern wall	City Planning Division	Prior to use permit approval
4.8-1B: The project sponsor shall incorporate additional architectural treatment or landscaping on the southern and western elevations where large expanses of blank wall are visible. This can include the use of trellises, the planting of additional trees next to the building, or scoring the concrete and painting the wall with a darker tone.	Project Sponsor	Confirm revision of plans for southern and western elevations incorporating use of trellises, planting of additional trees, or addition of architectural treatment	City Planning Division	Prior to use permit approval

Mitigation Measure	Person/Agency Responsible for Mitigation	Monitoring Requirements	Person/Agency Responsible for Monitoring	Timing or Frequency of Monitoring
4.8-3: The project sponsor shall revise the landscape plan to extend the tree mix around the south/southwest perimeter of the gas station area. The depth of the planting should be similar to that placed between the western property line and the gas station area as shown on the conceptual landscape plan in Figure 2-3.	Project Sponsor	Confirm that appropriate revisions have been made to landscape plan	City Planning Division	Prior to use permit approval
4.8-4A: The project sponsor shall reduce the wattage of the parking lot lights as well as install shorter light standards that do not exceed 30 feet. Two, 400-watt bulbs could be used on 30-foot-tall light poles.	Project Sponsor	Confirm that appropriate reductions in wattage and pole height have been made on lighting plan Conduct on-site inspection	City Planning Division City Planning Division	Review plan prior to use permit approval Prior to issuance of occupancy permit
4.8-4B: The project sponsor shall revise either the landscape plan or the lighting plan to avoid lighting conflicts between the trees and light poles. Either place the lights in the middle of the parking row reserving the ends for landscaping, or place a grouping of trees in the center of the parking row. If the latter alternative is selected, shrubbery should be placed around the base of the light pole.	Project Sponsor	Confirm that appropriate revisions have been made to either the landscape or lighting plan	City Planning Division	Prior to use permit approval
CULTURAL RESOURCES				
4.9-1A: During all grading and excavation activities, if cultural resources are encountered, all work shall be halted and the Planning Division notified at once.	Contractor	Notify City Planning Division when cultural resources encountered	Contractor/City Planning Division	During grading/ excavation activities
4.9-1B: If human remains are among any artifacts uncovered during site disturbance or excavation, all ground-disturbing work shall cease, and the County Coroner and City of Concord Chief of Planning and Building Official must be notified immediately. If the coroner determines the remains to be Native American, the Native American Heritage Commission must be contacted within 24 hours. The qualified archaeologist, in consultation with the Native American Heritage Commission, will recommend subsequent measures for disposition of the remains.	Contractor and/or Archaeologist	Confirm completion of contact with County Coroner, Native American Heritage commission, and qualified archaeologist	City Planning Division	Immediately following notification by project sponsor

C. Air Quality Methods and Assumptions

APPENDIX C
AIR QUALITY METHODS AND ASSUMPTIONS

CALINE-4 MODELING

A screening procedure for estimating carbon monoxide concentrations was applied to a selected worst-case intersections under three traffic scenarios. The screening procedure contained in *Transportation Project-Level Carbon Monoxide Protocol*[1] was utilized. The screening procedure is intended to allow the prediction of conservative estimates of carbon monoxide concentrations without having to run computational models such as EMFAC and CALINE4. The methodology uses estimates of the contributions to carbon monoxide concentrations for a "base case" characterized by a specific intersection configuration, meteorology, traffic volume and indicators of intersection performance. A series of correction factors are then applied to adjust the initial estimates of carbon monoxide concentrations for the specific conditions of the intersection under study. Correction factors are provided by a series of tables.

The following assumptions were made as input to the screening procedure as appropriate for a project in the San Francisco Bay Air Basin and based on project surroundings:

Geographical Location: Coastal/Coastal Valley

Average Cruise Speed: 35 mph (away from intersections)

Analysis Year: 2000

Percentage of Vehicle Operating in Cold Start Mode: 30 percent

Distance to Closet Receptor: 7 meters

Percentage Red Time: allocated according to approach volume.

The screening procedure provides a worst-case estimate of 1-hour concentrations of carbon monoxide. These 1-hour concentrations were converted to estimates of 8-hour averaged concentrations using a "persistence factor" (multiplier) of 0.7.

The screening procedure calculates the local contribution of nearby roads to the total concentration. The other contribution is the background level attributed to more distant traffic. The 1-hour background level was assumed to be 6.8 parts per million in 2000. This background concentrations was calculated using base year 1992 isopleths of carbon monoxide concentration and correction factors prepared by the Bay Area Air Quality Management District.

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[1] Garza, Vincente J.; Peter Granly; Daniel Sperling, *Transportation Project-Level Carbon Monoxide Protocol*, Institute of Transportation Studies, University of California, Davis; Report UCD-ITS-RR-97-21, December 1997.

URBEMIS7G

Estimates of regional emissions generated by project traffic were made using a program called URBEMIS-7G.[2] URBEMIS-7G is a program which estimates the emissions that result from various land use development projects. Land use project can include residential uses such as single-family dwelling units, apartments and condominiums, and nonresidential uses such as shopping centers, office buildings, and industrial parks. URBEMIS-7G contains default values for much of the information needed to calculate emissions. However, project-specific, user-supplied information can also be used when it is available.

Inputs to the URBEMIS-7G program include trip generation rates, vehicle mix, average trip length by trip type and average speed. Trip generation rates for project land uses were provided by the project transportation consultant. Average trip lengths for the Bay Area were used. Average speed for all types of trips was assumed to be 30 MPH. The analysis assumed a year 2000 vehicle population.

The URBEMIS-7G runs assumed summertime conditions with an ambient temperature of 85 degrees Fahrenheit. The URBEMIS-7G model calculates PM_{10} emissions from both exhaust and road dust.

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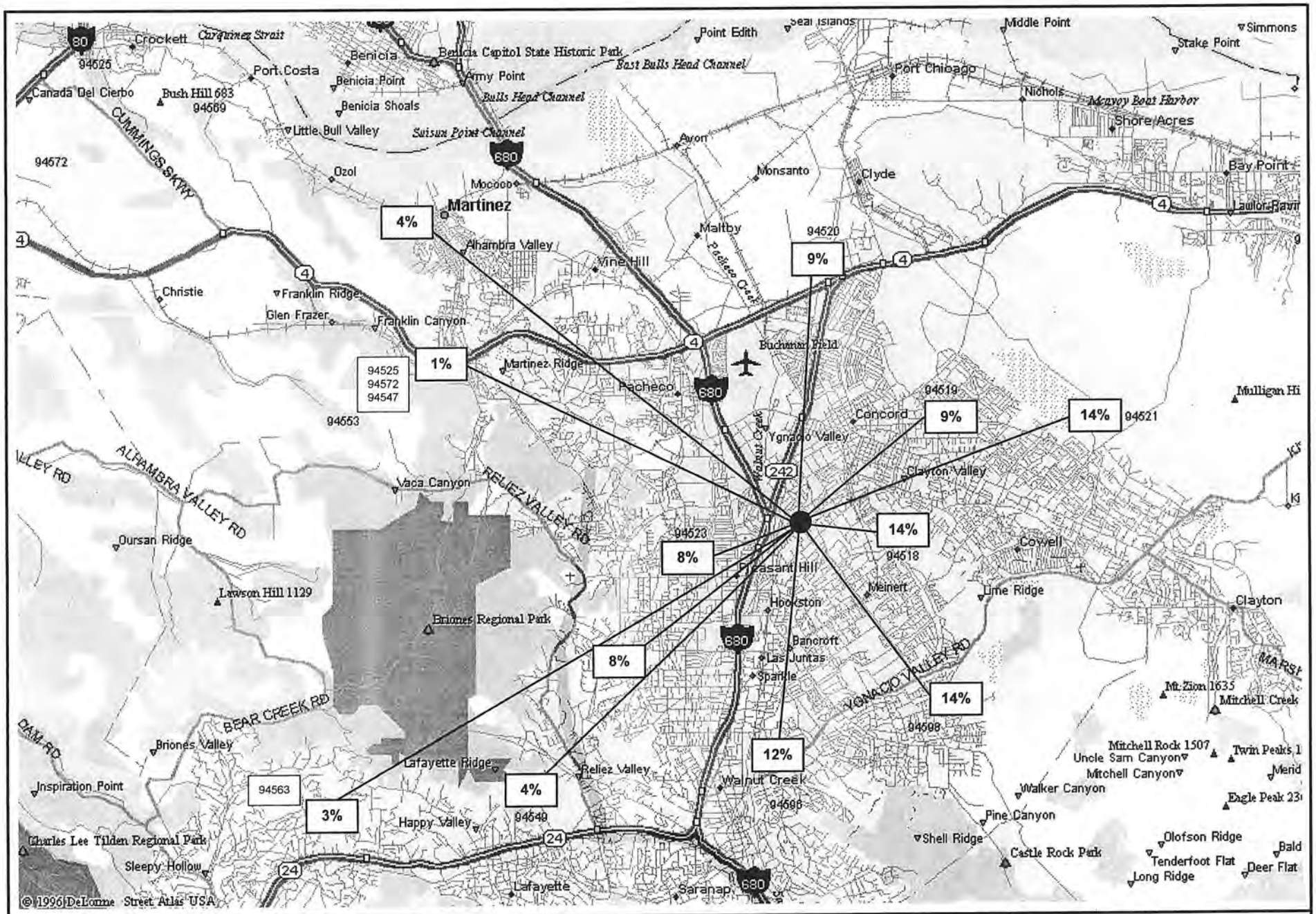
[2] San Joaquin Valley Unified Air Pollution Control District, *URBEMIS-7G User's Guide*, May 1998.

D. SUPPLEMENTARY TRAFFIC DATA

APPENDIX D-1

GLOBAL TRIP DISTRIBUTION BY ZIP CODE AND POPULATION DENSITY



Rajappan & Meyer
CONSULTING ENGINEERS INC

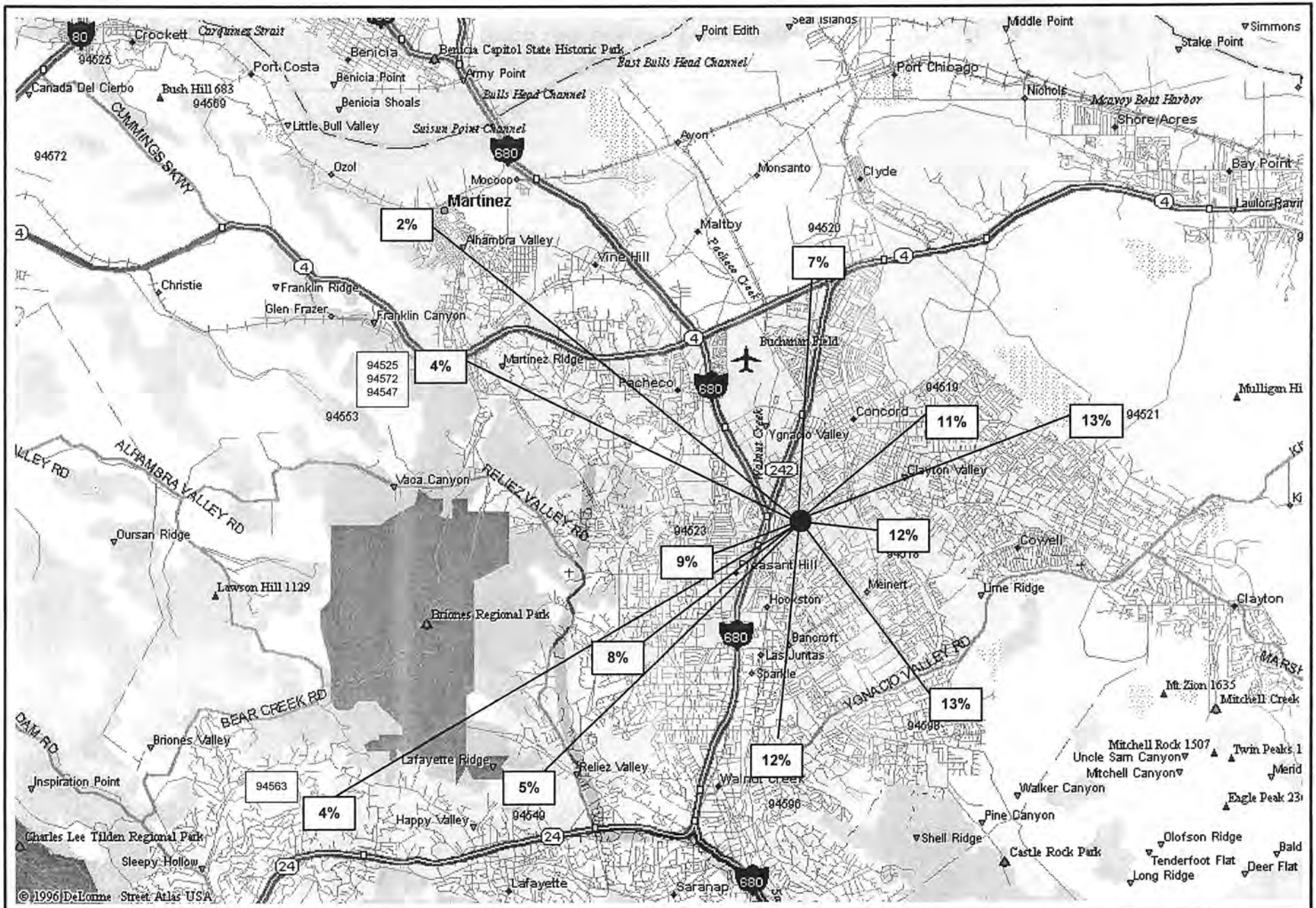
Costco - City of Concord Traffic Impact Study
Costco Store - Percentage Trip Distribution
Weekday PM Peak

N. T. S.

Figure

9006

5/13/99 - PC



Rajappan & Meyer
CONSULTING ENGINEERS INC

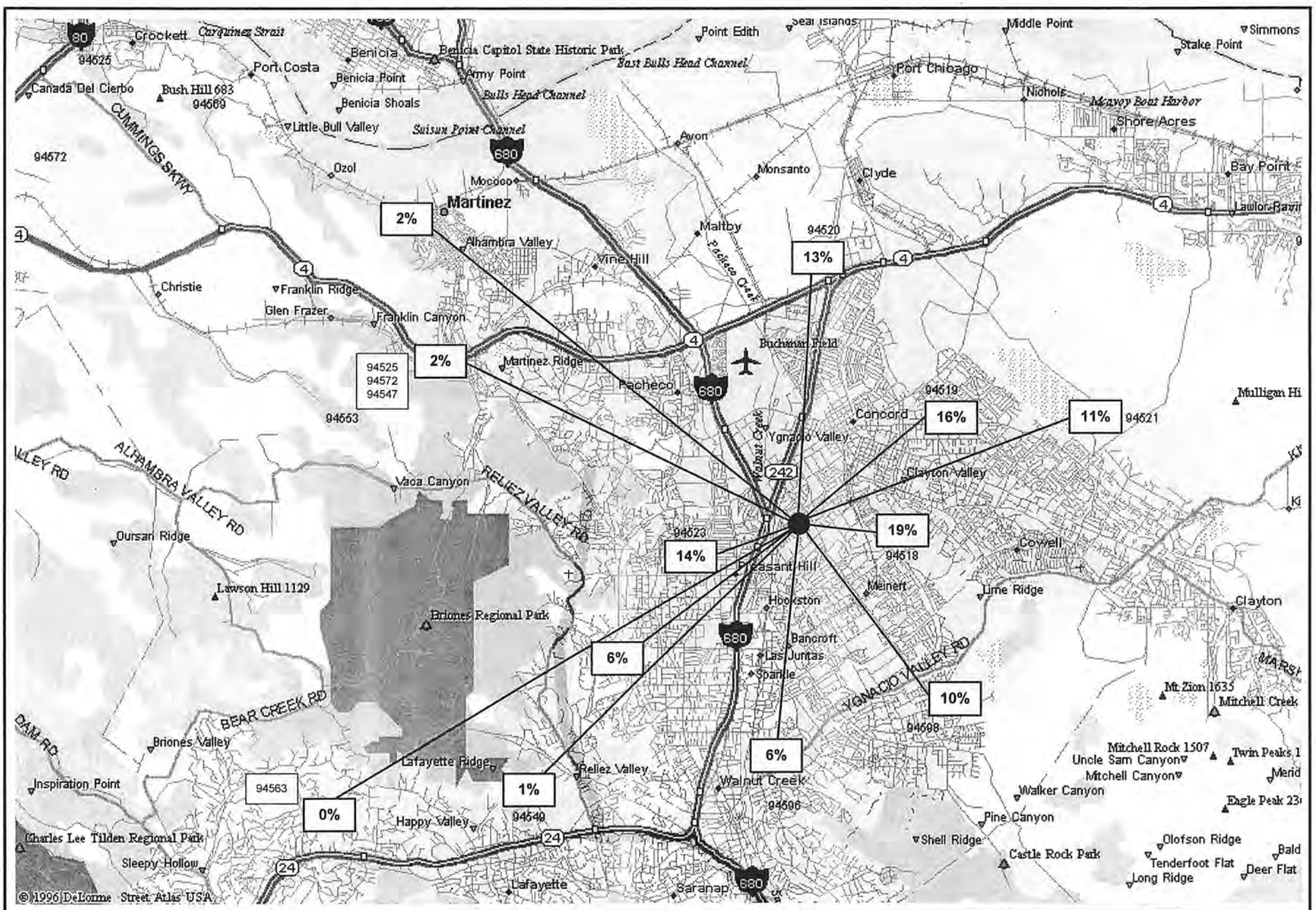
Costco - City of Concord Traffic Impact Study
Costco Store - Percentage Trip Distribution
Saturday Peak

N. T. S.

Figure

99006

5/13/99 - PC



Rajappan & Meyer
CONSULTING ENGINEERS INC

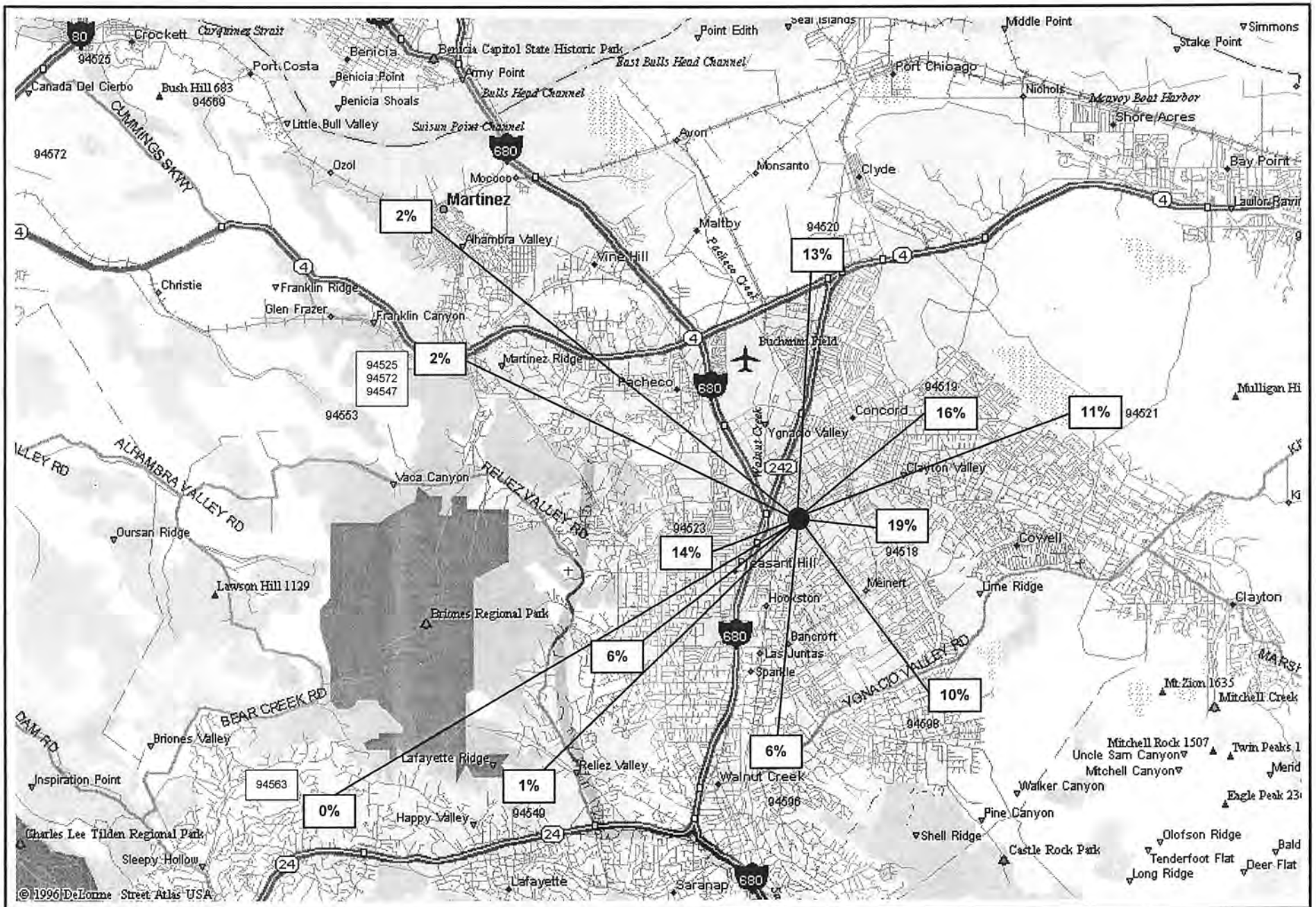
Costco - City of Concord Traffic Impact Study
Costco Gas Station -Percentage Trip Distribution
Weekday AM Peak

N. T. S.

Figure

00006

5/13/99 - PC



Rajappan & Meyer
CONSULTING ENGINEERS INC

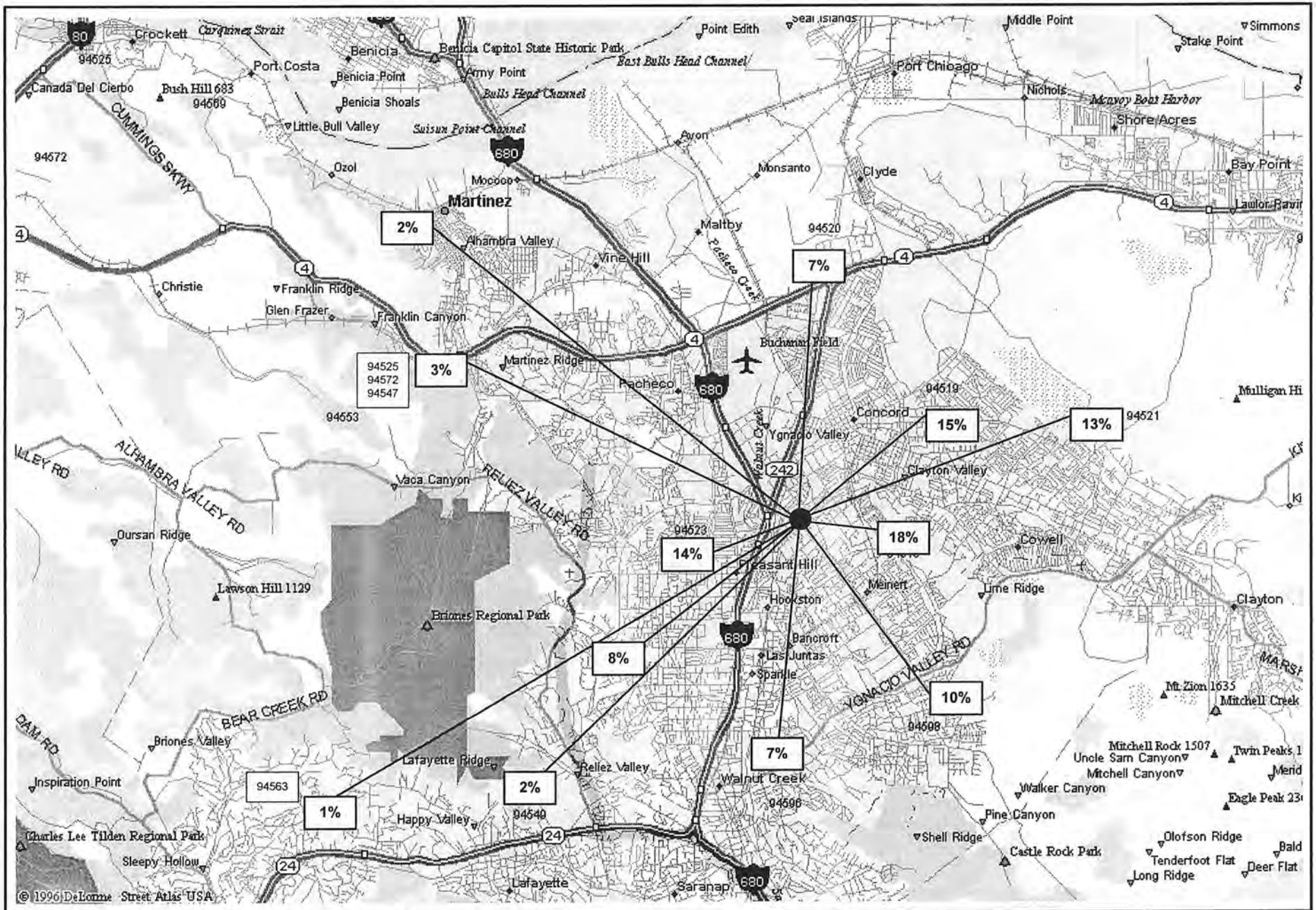
Costco - City of Concord Traffic Impact Study
Costco Gas Station - Percentage Trip Distribution
Weekday PM Peak

N. T. S.

Figure

99006

5/13/99 - PC



Rajappan & Meyer
CONSULTING ENGINEERS INC

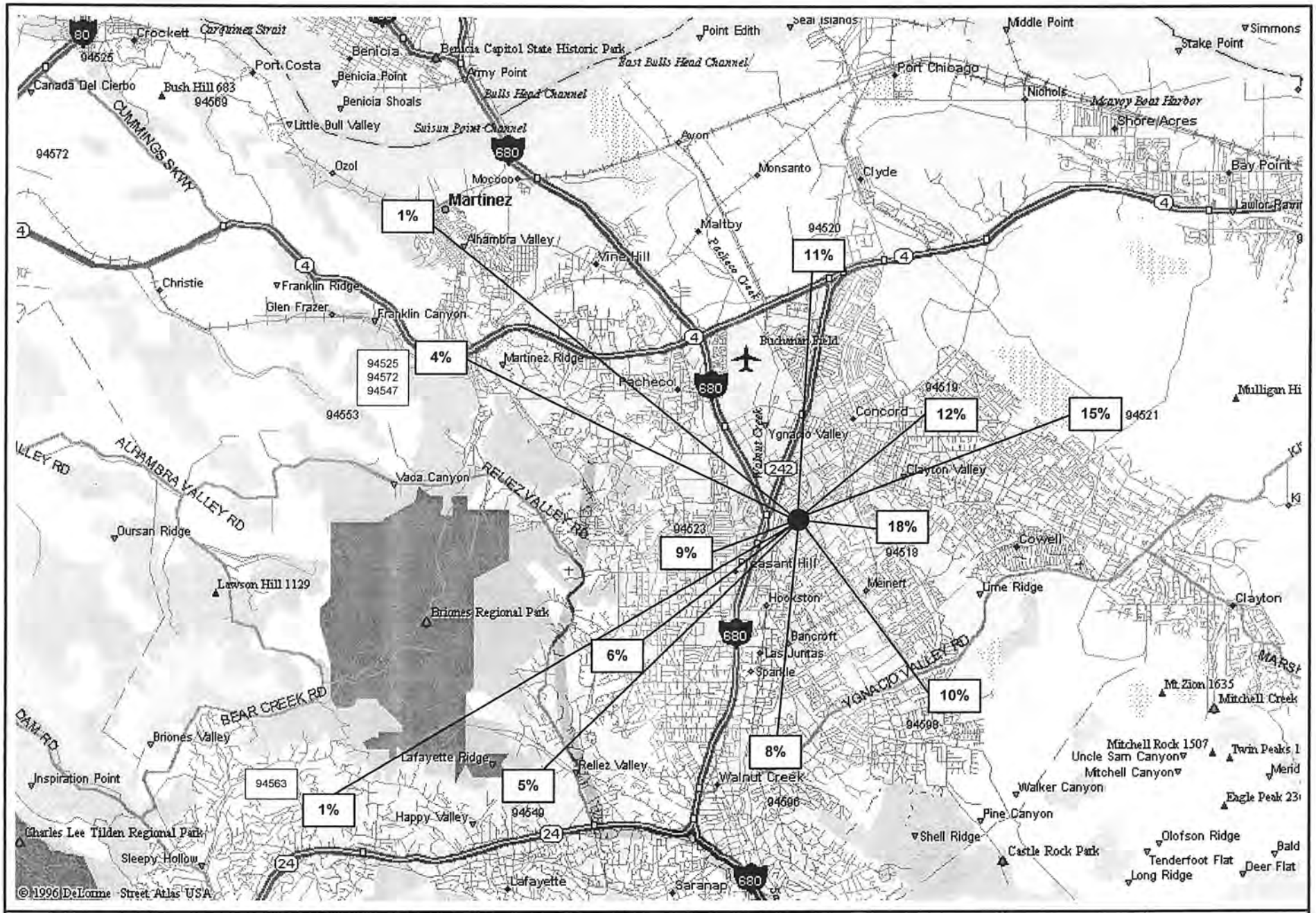
Costco - City of Concord Traffic Impact Study
Costco Gas Station - Percentage Trip Distribution
Saturday Peak

N. T. S.

Figure

9006

5/1 PC



Rajappan & Meyer
CONSULTING ENGINEERS INC

Costco - City of Concord Traffic Impact Study
Commercial - Percentage Trip Distribution
AM Peak, PM Peak & Saturday Peak

N. T. S.

Figure

99006

5/13/99 - PC

APPENDIX D-2

PROJECT TRIP ASSIGNMENT SPREADSHEETS

AM Peak

1. Detroit Avenue & Monument Boulevard

AM PEAK HOUR	Northbound			Southbound			Eastbound			Westbound		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Existing Condition	**88**	**98**	**192**	**28**	**275**	**238**	**101**	**516**	**134**	**352**	**1157**	**28**
Project Trips												
Costco Store												
Costco Gas Station	7	0	8	0	0	0	0	6	0	11	0	0
Commercial	15	1	10	0	5	0	0	0	0	95	0	0
Total Project Trips	***22***	***1***	***18***	***0***	***5***	***0***	***0***	***6***	***0***	***106***	***0***	***0***
Project Condition	**110**	**99**	**210**	**28**	**280**	**238**	**101**	**522**	**134**	**458**	**1157**	**28**
Growth %	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Growth Trips	4	5	10	1	14	12	5	26	7	18	58	1
Cumulative Condition	**114**	**104**	**220**	**29**	**294**	**250**	**106**	**548**	**141**	**476**	**1215**	**29**

2. Detroit Avenue & Whitman Road

AM PEAK HOUR	Northbound			Southbound			Eastbound			Westbound		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Existing Condition	**24**	**32**	**0**	**0**	**128**	**373**	**291**	**0**	**31**	**0**	**0**	**0**
Project Trips												
Costco Store												
Costco Gas Station	0	0	0	0	0	3	3	0	0	0	0	0
Commercial	0	0	0	0	0	4	29	0	0	0	0	0
Total Project Trips	***0***	***0***	***0***	***0***	***0***	***7***	***32***	***0***	***0***	***0***	***0***	***0***
Project Condition	**24**	**32**	**0**	**0**	**128**	**380**	**323**	**0**	**31**	**0**	**0**	**0**
Growth %	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Growth Trips	1	2	0	0	6	19	15	0	2	0	0	0
Cumulative Condition	**25**	**34**	**0**	**0**	**134**	**399**	**338**	**0**	**33**	**0**	**0**	**0**

3. Whitman Road & Oak Grove Road

AM PEAK HOUR	Northbound			Southbound			Eastbound			Westbound		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Existing Condition	**27**	**1082**	**378**	**22**	**1197**	**91**	**48**	**22**	**13**	**295**	**81**	**23**
Project Trips												
Costco Store												
Costco Gas Station	0	0	3	0	0	0	0	0	0	3	0	0
Commercial	0	0	29	0	0	0	0	0	0	4	0	0
Total Project Trips	***0***	***0***	***32***	***0***	***0***	***0***	***0***	***0***	***0***	***7***	***0***	***0***
Project Condition	**27**	**1082**	**410**	**22**	**1197**	**91**	**48**	**22**	**13**	**302**	**81**	**23**
Growth %	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Growth Trips	1	54	19	1	60	5	2	1	1	15	4	1
Cumulative Condition	**28**	**1136**	**429**	**23**	**1257**	**96**	**50**	**23**	**14**	**317**	**85**	**24**

4. Monument Boulevard & Oak Grove Road & Meadow Lane

AM PEAK HOUR	Northbound			Southbound			Eastbound			Westbound		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Existing Condition	**248**	**564**	**156**	**135**	**541**	**196**	**172**	**645**	**94**	**268**	**1154**	**76**
Project Trips												
Costco Store												
Costco Gas Station	0	0	0	0	0	0	0	7	0	0	7	0
Commercial	0	0	0	2	0	0	0	112	0	0	15	0
Total Project Trips	***0***	***0***	***0***	***2***	***0***	***0***	***0***	***119***	***0***	***0***	***22***	***0***
Project Condition	**248**	**564**	**156**	**137**	**541**	**196**	**172**	**764**	**94**	**268**	**1176**	**76**
Growth %	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Growth Trips	12	28	8	7	27	10	9	32	5	13	58	4
Cumulative Condition	**260**	**592**	**164**	**144**	**568**	**206**	**181**	**796**	**99**	**281**	**1234**	**80**

5. Monument Boulevard & Buskirk Avenue & Ramona Drive

AM PEAK HOUR	Northbound			Southbound			Eastbound			Westbound		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Existing Condition	**484**	**16**	**98**	**37**	**37**	**47**	**31**	**711**	**907**	**655**	**1424**	**10**
Project Trips												
Costco Store												
Costco Gas Station	0	0	0	0	0	0	0	7	0	0	7	0
Commercial	0	0	0	0	0	0	0	112	0	0	15	0
Total Project Trips	***0***	***0***	***0***	***0***	***0***	***0***	***0***	***119***	***0***	***0***	***22***	***0***
Project Condition	**484**	**16**	**98**	**37**	**37**	**47**	**31**	**830**	**907**	**655**	**1446**	**10**
Growth %	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Growth Trips	24	1	5	2	2	2	2	36	45	33	71	1
Cumulative Condition	**508**	**17**	**103**	**39**	**39**	**49**	**33**	**866**	**952**	**688**	**1517**	**11**

6. Detroit Avenue & Clayton Road

AM PEAK HOUR	Northbound			Southbound			Eastbound			Westbound		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Existing Condition	**367**	**0**	**124**	**0**	**0**	**0**	**0**	**864**	**290**	**77**	**697**	**0**
Project Trips												
Costco Store												
Costco Gas Station	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	1	0	0	0	0	0	0	0	5	0	0	0
Total Project Trips	***1***	***0***	***0***	***0***	***0***	***0***	***0***	***0***	***5***	***0***	***0***	***0***
Project Condition	**368**	**0**	**124**	**0**	**0**	**0**	**0**	**864**	**295**	**77**	**697**	**0**
Growth %	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Growth Trips	18	0	6	0	0	0	0	43	15	4	35	0
Cumulative Condition	**386**	**0**	**130**	**0**	**0**	**0**	**0**	**907**	**310**	**81**	**732**	**0**

7. Monument Boulevard & Galindo Street & Oakmead Drive & Cowell Road

AM PEAK HOUR	Northbound			Southbound			Eastbound			Westbound		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Existing Condition	**31**	**523**	**122**	**144**	**727**	**58**	**55**	**48**	**25**	**642**	**84**	**318**
Project Trips												
Costco Store												
Costco Gas Station	0	8	3	0	8	0	0	0	0	3	0	0
Commercial	0	10	3	0	70	0	0	0	0	24	0	0
Total Project Trips	***0***	***18***	***6***	***0***	***78***	***0***	***0***	***0***	***0***	***27***	***0***	***0***
Project Condition	**31**	**541**	**128**	**144**	**805**	**58**	**55**	**48**	**25**	**669**	**84**	**318**
Growth %	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Growth Trips	2	26	6	7	36	3	3	2	1	32	4	16
Cumulative Condition	**33**	**567**	**134**	**151**	**841**	**61**	**58**	**50**	**26**	**701**	**88**	**334**

8. Meadow Lane & Sunshine Drive

AM PEAK HOUR	Northbound			Southbound			Eastbound			Westbound		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Existing Condition	**14**	**654**	**63**	**24**	**606**	**4**	**50**	**17**	**23**	**96**	**22**	**61**
Project Trips												
Costco Store												
Costco Gas Station	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	0	0	0	0	2	0	0	0	0	0	0	0
Total Project Trips	***0***	***0***	***0***	***0***	***2***	***0***	***0***	***0***	***0***	***0***	***0***	***0***
Project Condition	**14**	**654**	**63**	**24**	**608**	**4**	**50**	**17**	**23**	**96**	**22**	**61**
Growth %	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Growth Trips	1	33	3	1	30	0	3	1	1	5	1	3
Cumulative Condition	**15**	**687**	**66**	**25**	**638**	**4**	**53**	**18**	**24**	**101**	**23**	**64**

9. Treat Boulevard & Oak Grove Road

AM PEAK HOUR	Northbound			Southbound			Eastbound			Westbound		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Existing Condition	**342**	**448**	**42**	**81**	**655**	**157**	**265**	**445**	**326**	**342**	**1566**	**67**
Project Trips												
Costco Store												
Costco Gas Station	0	3	0	0	3	0	0	0	0	0	0	0
Commercial	0	29	0	0	4	0	0	0	0	0	0	0
Total Project Trips	***0***	***32***	***0***	***0***	***7***	***0***	***0***	***0***	***0***	***0***	***0***	***0***
Project Condition	**342**	**480**	**42**	**81**	**662**	**157**	**265**	**445**	**326**	**342**	**1566**	**67**
Growth %	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Growth Trips	17	22	2	4	33	8	13	22	16	17	78	3
Cumulative Condition	**359**	**502**	**44**	**85**	**695**	**165**	**278**	**467**	**342**	**359**	**1644**	**70**

10. Cowell Road & San Miguel Road & Mesa Street

AM PEAK HOUR	Northbound			Southbound			Eastbound			Westbound		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Existing Condition	**14**	**164**	**95**	**12**	**308**	**153**	**51**	**311**	**89**	**0**	**1075**	**47**
Project Trips												
Costco Store												
Costco Gas Station	0	0	0	0	0	0	0	3	0	0	3	0
Commercial	0	0	0	0	0	0	0	3	0	0	24	0
Total Project Trips	***0***	***0***	***0***	***0***	***0***	***0***	***0***	***6***	***0***	***0***	***27***	***0***
Project Condition	**14**	**164**	**95**	**12**	**308**	**153**	**51**	**317**	**89**	**0**	**1102**	**47**
Growth %	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Growth Trips	1	8	5	1	15	8	3	16	4	0	54	2
Cumulative Condition	**15**	**172**	**100**	**13**	**323**	**161**	**54**	**333**	**93**	**0**	**1156**	**49**

PM Peak

1. Detroit Avenue & Monument Boulevard

PM PEAK HOUR	Northbound			Southbound			Eastbound			Westbound		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Existing Condition	**144**	**154**	**266**	**47**	**132**	**249**	**249**	**1026**	**124**	**195**	**1005**	**62**
Project Trips												
Costco Store	149	12	91	0	12	0	0	70	0	160	0	0
Costco Gas Station	21	1	19	0	1	0	0	14	0	33	0	0
Commercial	88	4	41	0	1	0	0	32	8	10	0	0
Total Project Trips	***258***	***17***	***151***	***0***	***14***	***0***	***0***	***116***	***8***	***203***	***0***	***0***
Project Condition	**402**	**171**	**417**	**47**	**146**	**249**	**249**	**1142**	**132**	**398**	**1005**	**62**
Growth %	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Growth Trips	7	8	13	2	7	12	12	51	6	10	50	3
Cumulative Condition	**409**	**179**	**430**	**49**	**153**	**261**	**261**	**1193**	**138**	**408**	**1055**	**65**

2. Detroit Avenue & Whitman Road

PM PEAK HOUR	Northbound			Southbound			Eastbound			Westbound		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Existing Condition	**36**	**100**	**0**	**0**	**48**	**330**	**245**	**0**	**22**	**0**	**0**	**0**
Project Trips												
Costco Store	0	0	0	0	0	71	70	0	0	0	0	0
Costco Gas Station	0	0	0	0	0	8	8	0	0	0	0	0
Commercial	0	0	0	0	0	22	3	0	0	0	0	0
Total Project Trips	***0***	***0***	***0***	***0***	***0***	***101***	***81***	***0***	***0***	***0***	***0***	***0***
Project Condition	**36**	**100**	**0**	**0**	**48**	**431**	**326**	**0**	**22**	**0**	**0**	**0**
Growth %	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Growth Trips	2	5	0	0	2	17	12	0	1	0	0	0
Cumulative Condition	**38**	**105**	**0**	**0**	**50**	**448**	**338**	**0**	**23**	**0**	**0**	**0**

3. Whitman Road & Oak Grove Road

PM PEAK HOUR	Northbound			Southbound			Eastbound			Westbound		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Existing Condition	**19**	**916**	**201**	**24**	**871**	**49**	**38**	**27**	**12**	**267**	**36**	**33**
Project Trips												
Costco Store	0	0	70	0	0	0	0	0	0	71	0	0
Costco Gas Station	0	0	8	0	0	0	0	0	0	8	0	0
Commercial	0	0	3	0	0	0	0	0	0	22	0	0
Total Project Trips	***0***	***0***	***81***	***0***	***0***	***0***	***0***	***0***	***0***	***101***	***0***	***0***
Project Condition	**19**	**916**	**282**	**24**	**871**	**49**	**38**	**27**	**12**	**368**	**36**	**33**
Growth %	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Growth Trips	1	46	10	1	44	2	2	1	1	13	2	2
Cumulative Condition	**20**	**962**	**292**	**25**	**915**	**51**	**40**	**28**	**13**	**381**	**38**	**35**

4. Monument Boulevard & Oak Grove Road & Meadow Lane

PM PEAK HOUR	Northbound			Southbound			Eastbound			Westbound		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Existing Condition	**268**	**532**	**128**	**245**	**601**	**165**	**141**	**958**	**192**	**276**	**918**	**144**
Project Trips												
Costco Store	0	0	0	4	0	0	0	145	0	0	145	4
Costco Gas Station	0	0	0	1	0	0	0	20	0	0	20	1
Commercial	0	0	0	0	0	0	0	12	0	0	86	2
Total Project Trips	***0***	***0***	***0***	***5***	***0***	***0***	***0***	***177***	***0***	***0***	***251***	***7***
Project Condition	**268**	**532**	**128**	**250**	**601**	**165**	**141**	**1135**	**192**	**276**	**1169**	**151**
Growth %	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Growth Trips	13	27	6	12	30	8	7	48	10	14	46	7
Cumulative Condition	**281**	**559**	**134**	**262**	**631**	**173**	**148**	**1183**	**202**	**290**	**1215**	**158**

5. Monument Boulevard & Buskirk Avenue & Ramona Drive

PM PEAK HOUR	Northbound			Southbound			Eastbound			Westbound		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Existing Condition	**649**	**26**	**284**	**11**	**5**	**11**	**108**	**1400**	**502**	**263**	**1100**	**16**
Project Trips												
Costco Store	0	0	0	0	0	0	0	145	0	0	145	0
Costco Gas Station	0	0	0	0	0	0	0	20	0	0	20	0
Commercial	0	0	0	0	0	0	0	12	0	0	86	0
Total Project Trips	***0***	***0***	***0***	***0***	***0***	***0***	***0***	***177***	***0***	***0***	***251***	***0***
Project Condition	**649**	**26**	**284**	**11**	**5**	**11**	**108**	**1577**	**502**	**263**	**1351**	**16**
Growth %	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Growth Trips	32	1	14	1	0	1	5	70	25	13	55	1
Cumulative Condition	**681**	**27**	**298**	**12**	**5**	**12**	**113**	**1647**	**527**	**276**	**1406**	**17**

6. Detroit Avenue & Clayton Road

PM PEAK HOUR	Northbound			Southbound			Eastbound			Westbound		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Existing Condition	**344**	**0**	**177**	**0**	**0**	**0**	**0**	**844**	**370**	**170**	**897**	**0**
Project Trips												
Costco Store	12	0	0	0	0	0	0	0	12	0	0	0
Costco Gas Station	1	0	0	0	0	0	0	0	1	0	0	0
Commercial	4	0	0	0	0	0	0	0	1	0	0	0
Total Project Trips	***17***	***0***	***0***	***0***	***0***	***0***	***0***	***0***	***14***	***0***	***0***	***0***
Project Condition	**361**	**0**	**177**	**0**	**0**	**0**	**0**	**844**	**384**	**170**	**897**	**0**
Growth %	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Growth Trips	17	0	9	0	0	0	0	42	19	9	45	0
Cumulative Condition	**378**	**0**	**186**	**0**	**0**	**0**	**0**	**886**	**403**	**179**	**942**	**0**

7. Monument Boulevard & Galindo Street & Oakmead Drive & Cowell Road

PM PEAK HOUR	Northbound			Southbound			Eastbound			Westbound		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Existing Condition	**65**	**667**	**386**	**605**	**651**	**66**	**39**	**105**	**16**	**289**	**86**	**220**
Project Trips												
Costco Store	0	122	39	0	121	0	0	0	0	39	0	0
Costco Gas Station	0	25	8	0	25	0	0	0	0	8	0	0
Commercial	0	54	19	0	8	0	0	0	0	3	0	0
Total Project Trips	***0***	***201***	***66***	***0***	***154***	***0***	***0***	***0***	***0***	***50***	***0***	***0***
Project Condition	**65**	**868**	**452**	**605**	**805**	**66**	**39**	**105**	**16**	**339**	**86**	**220**
Growth %	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Growth Trips	3	33	19	30	33	3	2	5	1	14	4	11
Cumulative Condition	**68**	**901**	**471**	**635**	**838**	**69**	**41**	**110**	**17**	**353**	**90**	**231**

8. Meadow Lane & Sunshine Drive

PM PEAK HOUR	Northbound			Southbound			Eastbound			Westbound		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Existing Condition	**24**	**770**	**82**	**43**	**759**	**18**	**50**	**30**	**17**	**74**	**32**	**42**
Project Trips												
Costco Store	0	4	0	0	4	0	0	0	0	0	0	0
Costco Gas Station	0	1	0	0	1	0	0	0	0	0	0	0
Commercial	0	2	0	0	0	0	0	0	0	0	0	0
Total Project Trips	***0***	***7***	***0***	***0***	***5***	***0***	***0***	***0***	***0***	***0***	***0***	***0***
Project Condition	**24**	**777**	**82**	**43**	**764**	**18**	**50**	**30**	**17**	**74**	**32**	**42**
Growth %	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Growth Trips	1	39	4	2	38	1	3	2	1	4	2	2
Cumulative Condition	**25**	**816**	**86**	**45**	**802**	**19**	**53**	**32**	**18**	**78**	**34**	**44**

9. Treat Boulevard & Oak Grove Road

PM PEAK HOUR	Northbound			Southbound			Eastbound			Westbound		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Existing Condition	**315**	**452**	**199**	**285**	**520**	**94**	**247**	**1512**	**141**	**175**	**539**	**145**
Project Trips												
Costco Store	0	70	0	0	71	0	0	0	0	0	0	0
Costco Gas Station	0	8	0	0	8	0	0	0	0	0	0	0
Commercial	0	3	0	0	22	0	0	0	0	0	0	0
Total Project Trips	***0***	***81***	***0***	***0***	***101***	***0***	***0***	***0***	***0***	***0***	***0***	***0***
Project Condition	**315**	**533**	**199**	**285**	**621**	**94**	**247**	**1512**	**141**	**175**	**539**	**145**
Growth %	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Growth Trips	16	23	10	14	26	5	12	76	7	9	27	7
Cumulative Condition	**331**	**556**	**209**	**299**	**647**	**99**	**259**	**1588**	**148**	**184**	**566**	**152**

10. Cowell Road & San Miguel Road & Mesa Street

PM PEAK HOUR	Northbound			Southbound			Eastbound			Westbound		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Existing Condition	**32**	**209**	**270**	**42**	**126**	**98**	**87**	**1210**	**75**	**0**	**563**	**28**
Project Trips												
Costco Store	0	0	0	0	0	0	0	39	0	0	39	0
Costco Gas Station	0	0	0	0	0	0	0	8	0	0	8	0
Commercial	0	0	0	0	0	0	0	19	0	0	3	0
Total Project Trips	***0***	***0***	***0***	***0***	***0***	***0***	***0***	***66***	***0***	***0***	***50***	***0***
Project Condition	**32**	**209**	**270**	**42**	**126**	**98**	**87**	**1276**	**75**	**0**	**613**	**28**
Growth %	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Growth Trips	2	10	14	2	6	5	4	61	4	0	28	1
Cumulative Condition	**34**	**219**	**284**	**44**	**132**	**103**	**91**	**1337**	**79**	**0**	**641**	**29**

Saturday Peak

1. Detroit Avenue & Monument Boulevard

SATURDAY PEAK HOUR	Northbound			Southbound			Eastbound			Westbound		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Existing Condition	**88**	**67**	**107**	**45**	**82**	**217**	**213**	**828**	**59**	**105**	**752**	**46**
Project Trips												
Costco Store	212	16	103	0	16	0	0	99	0	208	0	0
Costco Gas Station	20	2	14	0	2	0	0	14	0	28	0	0
Commercial	62	3	27	0	3	0	0	25	0	54	0	0
Total Project Trips	***294***	***21***	***144***	***0***	***21***	***0***	***0***	***138***	***0***	***290***	***0***	***0***
Project Condition	**382**	**88**	**251**	**45**	**103**	**217**	**213**	**966**	**59**	**395**	**752**	**46**
Growth %	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Growth Trips	4	3	5	2	4	11	11	41	3	5	38	2
Cumulative Condition	**386**	**91**	**256**	**47**	**107**	**228**	**224**	**1007**	**62**	**400**	**790**	**48**

2. Detroit Avenue & Whitman Road

SATURDAY PEAK HOUR	Northbound			Southbound			Eastbound			Westbound		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Existing Condition	**7**	**34**	**0**	**0**	**34**	**135**	**114**	**0**	**10**	**0**	**0**	**0**
Project Trips												
Costco Store	0	0	0	0	0	88	91	0	0	0	0	0
Costco Gas Station	0	0	0	0	0	8	8	0	0	0	0	0
Commercial	0	0	0	0	0	16	17	0	0	0	0	0
Total Project Trips	***0***	***0***	***0***	***0***	***0***	***112***	***116***	***0***	***0***	***0***	***0***	***0***
Project Condition	**7**	**34**	**0**	**0**	**34**	**247**	**230**	**0**	**10**	**0**	**0**	**0**
Growth %	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Growth Trips	0	2	0	0	2	7	6	0	1	0	0	0
Cumulative Condition	**7**	**36**	**0**	**0**	**36**	**254**	**236**	**0**	**11**	**0**	**0**	**0**

3. Whitman Road & Oak Grove Road

SATURDAY PEAK HOUR	Northbound			Southbound			Eastbound			Westbound		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Existing Condition	**15**	**633**	**97**	**16**	**682**	**56**	**57**	**10**	**14**	**96**	**21**	**22**
Project Trips												
Costco Store	0	0	91	0	0	0	0	0	0	88	0	0
Costco Gas Station	0	0	8	0	0	0	0	0	0	8	0	0
Commercial	0	0	17	0	0	0	0	0	0	16	0	0
Total Project Trips	***0***	***0***	***116***	***0***	***0***	***0***	***0***	***0***	***0***	***112***	***0***	***0***
Project Condition	**15**	**633**	**213**	**16**	**682**	**56**	**57**	**10**	**14**	**208**	**21**	**22**
Growth %	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Growth Trips	1	32	5	1	34	3	3	1	1	5	1	1
Cumulative Condition	**16**	**665**	**218**	**17**	**716**	**59**	**60**	**11**	**15**	**213**	**22**	**23**

4. Monument Boulevard & Oak Grove Road & Meadow Lane

SATURDAY PEAK HOUR	Northbound			Southbound			Eastbound			Westbound		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Existing Condition	**310**	**367**	**103**	**229**	**431**	**121**	**143**	**756**	**208**	**217**	**780**	**130**
Project Trips												
Costco Store	0	0	0	11	0	0	0	208	0	0	202	10
Costco Gas Station	0	0	0	1	0	0	0	19	0	0	19	1
Commercial	0	0	0	1	0	0	0	64	0	0	61	1
Total Project Trips	***0***	***0***	***0***	***13***	***0***	***0***	***0***	***291***	***0***	***0***	***282***	***12***
Project Condition	**310**	**367**	**103**	**242**	**431**	**121**	**143**	**1047**	**208**	**217**	**1062**	**142**
Growth %	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Growth Trips	16	18	5	11	22	6	7	38	10	11	39	7
Cumulative Condition	**326**	**385**	**108**	**253**	**453**	**127**	**150**	**1085**	**218**	**228**	**1101**	**149**

5. Monument Boulevard & Buskirk Avenue & Ramona Drive

SATURDAY PEAK HOUR	Northbound			Southbound			Eastbound			Westbound		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Existing Condition	**607**	**11**	**100**	**14**	**12**	**41**	**130**	**988**	**511**	**263**	**1063**	**16**
Project Trips												
Costco Store	0	0	0	0	0	0	0	208	0	0	202	0
Costco Gas Station	0	0	0	0	0	0	0	19	0	0	19	0
Commercial	0	0	0	0	0	0	0	64	0	0	61	0
Total Project Trips	***0***	***0***	***0***	***0***	***0***	***0***	***0***	***291***	***0***	***0***	***282***	***0***
Project Condition	**607**	**11**	**100**	**14**	**12**	**41**	**130**	**1279**	**511**	**263**	**1345**	**16**
Growth %	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Growth Trips	30	1	5	1	1	2	7	49	26	13	53	1
Cumulative Condition	**637**	**12**	**105**	**15**	**13**	**43**	**137**	**1328**	**537**	**276**	**1398**	**17**

6. Detroit Avenue & Clayton Road

SATURDAY PEAK HOUR	Northbound			Southbound			Eastbound			Westbound		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Existing Condition	**275**	**0**	**139**	**0**	**0**	**0**	**0**	**547**	**232**	**143**	**538**	**0**
Project Trips												
Costco Store	16	0	0	0	0	0	0	0	16	0	0	0
Costco Gas Station	2	0	0	0	0	0	0	0	2	0	0	0
Commercial	3	0	0	0	0	0	0	0	3	0	0	0
Total Project Trips	***21***	***0***	***0***	***0***	***0***	***0***	***0***	***0***	***21***	***0***	***0***	***0***
Project Condition	**296**	**0**	**139**	**0**	**0**	**0**	**0**	**547**	**253**	**143**	**538**	**0**
Growth %	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Growth Trips	14	0	7	0	0	0	0	27	12	7	27	0
Cumulative Condition	**310**	**0**	**146**	**0**	**0**	**0**	**0**	**574**	**265**	**150**	**565**	**0**

7. Monument Boulevard & Galindo Street & Oakmead Drive & Cowell Road

SATURDAY PEAK HOUR	Northbound			Southbound			Eastbound			Westbound		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Existing Condition	**48**	**482**	**221**	**402**	**476**	**64**	**48**	**64**	**29**	**347**	**80**	**363**
Project Trips												
Costco Store	0	145	57	0	149	0	0	0	0	57	0	0
Costco Gas Station	0	21	7	0	21	0	0	0	0	7	0	0
Commercial	0	39	13	0	40	0	0	0	0	14	0	0
Total Project Trips	***0***	***205***	***77***	***0***	***210***	***0***	***0***	***0***	***0***	***78***	***0***	***0***
Project Condition	**48**	**687**	**298**	**402**	**686**	**64**	**48**	**64**	**29**	**425**	**80**	**363**
Growth %	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Growth Trips	2	24	11	20	24	3	2	3	1	17	4	18
Cumulative Condition	**50**	**711**	**309**	**422**	**710**	**67**	**50**	**67**	**30**	**442**	**84**	**381**

8. Meadow Lane & Sunshine Drive

SATURDAY PEAK HOUR	Northbound			Southbound			Eastbound			Westbound		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Existing Condition	**12**	**643**	**65**	**27**	**639**	**13**	**20**	**8**	**26**	**59**	**5**	**18**
Project Trips												
Costco Store	0	10	0	0	11	0	0	0	0	0	0	0
Costco Gas Station	0	1	0	0	1	0	0	0	0	0	0	0
Commercial	0	1	0	0	1	0	0	0	0	0	0	0
Total Project Trips	***0***	***12***	***0***	***0***	***13***	***0***	***0***	***0***	***0***	***0***	***0***	***0***
Project Condition	**12**	**655**	**65**	**27**	**652**	**13**	**20**	**8**	**26**	**59**	**5**	**18**
Growth %	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Growth Trips	1	32	3	1	32	1	1	0	1	3	0	1
Cumulative Condition	**13**	**687**	**68**	**28**	**684**	**14**	**21**	**8**	**27**	**62**	**5**	**19**

9. Treat Boulevard & Oak Grove Road

SATURDAY PEAK HOUR	Northbound			Southbound			Eastbound			Westbound		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Existing Condition	**195**	**402**	**78**	**184**	**374**	**139**	**221**	**757**	**133**	**155**	**686**	**156**
Project Trips												
Costco Store	0	91	0	0	88	0	0	0	0	0	0	0
Costco Gas Station	0	8	0	0	8	0	0	0	0	0	0	0
Commercial	0	17	0	0	16	0	0	0	0	0	0	0
Total Project Trips	***0***	***116***	***0***	***0***	***112***	***0***	***0***	***0***	***0***	***0***	***0***	***0***
Project Condition	**195**	**518**	**78**	**184**	**486**	**139**	**221**	**757**	**133**	**155**	**686**	**156**
Growth %	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Growth Trips	10	20	4	9	19	7	11	38	7	8	34	8
Cumulative Condition	**205**	**538**	**82**	**193**	**505**	**146**	**232**	**795**	**140**	**163**	**720**	**164**

10. Cowell Road & San Miguel Road & Mesa Street

SATURDAY PEAK HOUR	Northbound			Southbound			Eastbound			Westbound		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Existing Condition	**23**	**69**	**131**	**6**	**70**	**97**	**66**	**567**	**46**	**0**	**581**	**16**
Project Trips												
Costco Store	0	0	0	0	0	0	0	57	0	0	57	0
Costco Gas Station	0	0	0	0	0	0	0	7	0	0	7	0
Commercial	0	0	0	0	0	0	0	13	0	0	14	0
Total Project Trips	***0***	***0***	***0***	***0***	***0***	***0***	***0***	***77***	***0***	***0***	***78***	***0***
Project Condition	**23**	**69**	**131**	**6**	**70**	**97**	**66**	**644**	**46**	**0**	**659**	**16**
Growth %	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Growth Trips	1	3	7	0	4	5	3	28	2	0	29	1
Cumulative Condition	**24**	**72**	**138**	**6**	**74**	**102**	**69**	**672**	**48**	**0**	**688**	**17**

E. Supplementary Biological Resources Information

EXPLANATION OF SENSITIVITY STATUS CODES

AGENCIES

USFWS = U.S. Fish and Wildlife Service
CDFG = California Department of Fish and Game
CNPS = California Native Plant Society
BLM = Bureau of Land Management
USFS = U.S. Forest Service

CALIFORNIA NATIVE PLANT SOCIETY DESIGNATIONS

List 1: Plants of highest priority
List 1A: Plants presumed extinct in California
List 1B: Plants rare and endangered in California and elsewhere
List 2: Plants rare and endangered in California but more common elsewhere
List 3: Plants about which additional data are needed
List 4: Plants of limited distribution

CNPS R-E-D Codes

R (Rarity)
1 = Rare, but found in sufficient numbers and distributed widely enough that the potential for extinction or extirpation is low at this time.
2 = Occurrence confined to several populations or to one extended population.
3 = Occurrence limited to one or a few highly restricted populations, or present in such low numbers that it is seldom reported.
? = More data are needed

E (Endangerment)
1 = Not endangered
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FEDERAL DESIGNATIONS

FE = listed as Endangered by the Federal Government
FT = listed as Threatened by the Federal Government
FPE = proposed as Endangered by the Federal Government
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EXPLANATION OF SENSITIVITY STATUS CODES

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CALIFORNIA NATIVE PLANT SOCIETY DESIGNATIONS

List 1: Plants of highest priority
List 1A: Plants presumed extinct in California
List 1B: Plants rare and endangered in California and elsewhere
List 2: Plants rare and endangered in California but more common elsewhere
List 3: Plants about which additional data are needed
List 4: Plants of limited distribution

CNPS R-E-D Codes

R (Rarity)
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ATTACHMENT C

ADDENDUM TO COSTCO WHOLESALE DEVELOPMENT ENVIRONMENTAL IMPACT REPORT

THE CITY OF CONCORD

May 2015

URBAN PLANNING PARTNERS INC.

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I. INTRODUCTION

A. DETERMINATION

This document is an Addendum to the December 1999 Environmental Impact Report ("1999 EIR") prepared for the original Costco Wholesale Development project approved by the City of Concord (hereafter referred to as the "1999 Project"). The 1999 EIR was prepared and circulated pursuant to the California Environmental Quality Act (CEQA). The 1999 Project, the 1999 EIR and the associated Mitigation and Monitoring Program ("MMP") were considered by the Planning Commission on November 17, 1999 (Planning Commission Resolution No. 99-1) and were certified and adopted by the Concord City Council on December 14, 1999 (City Council Resolution No. 99-119) along with a Statement of Findings that potential impacts would be reduced to less-than-significant levels, except for one significant and unavoidable impact on the environment related to regional emissions. A Statement of Overriding Considerations was adopted by the Council finding that the benefits of the 1999 Project outweighed the one significant unavoidable environmental impact. The MMP, the Statement of Findings, and the Statement of Overriding Considerations are included within the definition of "1999 EIR."

The 1999 Project included the following components on 15.75 acres at the southwest corner of Monument Boulevard and Detroit Avenue:

- an approximately 147,000-square foot bulk retail/wholesale facility;
- a 5,200-square-foot tire center;
- a 1,075-square-foot food court;
- a three island gas station with a total of six (6) multi-product dispensers; and
- approximately 70,000 square feet of additional commercial/industrial space.

The 1999 Project, consisting of the aforementioned components, was approved under Use Permit No. 26-99 and built immediately after approval. Per the findings of the 1999 EIR, which identified a potential significant impact related to the originally planned location of the gas station at the southwestern corner of the site, the Use Permit approved a revised site plan that relocated the gas station to the northern edge of the site along Monument Boulevard. The three island gas station was constructed in this new location.

In 2001, the Use Permit was amended (UPA 2-01) to expand the existing three island gas station with one (1) fueling island containing two (2) multi-product dispensers (MPDs), together with expansion of the overhead canopy ("Approved Island"). On-site parking was not affected. The Approved Island was classified as categorically exempt from CEQA

review under Section 15301, Class 1, "Existing Facilities," as a minor addition to an existing facility.[1] This expansion was completed and represents the current state of the existing fueling facility.

In 2007, a Zoning Administrator Permit (ZA 07-003) and Design Review (DR 07-012) were approved for a 3,840 square foot receiving dock expansion and a 7,840 square foot enclosed garden center addition ("2007 Expansion"). The 2007 Expansion was classified as categorically exempt from CEQA review under Section 15301, "Existing Facilities," as a minor addition to the existing structure.[2]

In 2011, a Zoning Administrator Permit (ZA 11-010) and Design Review application (DR 11-017) were approved for an employee parking lot expansion ("Approved Lot") on an adjacent 1.74-acre vacant site at the corner of Detroit and Cloverdale Avenue, immediately east of the Costco store and main parking lot.[3,4] The project provided an additional 162[5,6] standard parking spaces and related site improvements including new landscaping and lighting. The Approved Lot was classified as categorically exempt from CEQA review under Section 15311, Class 11, "Accessory Structures," for projects involving construction of a structure that is accessory to an existing commercial facility, including small parking lots.[7]

The 1999 Project, the Approved Island, 2007 Expansion, and the Approved Lot are collectively referred to herein as the "Approved Project."

In 2013, Costco Wholesale filed an application to expand the existing fueling facility. Costco finalize the project scope in April 2015 following various project revisions to include the following requests:

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[1] California Code of Regulations, Title 14, Division 6, Chapter 3, Article 19. Categorical Exemptions, Section 15301, Class 1, Existing Facilities.

[2] Ibid.

[3] City of Concord, 2011. Report to Zoning Administrator: Costco Wholesale Parking Lot Expansion – Zoning Administrator Permit (ZA 11-010) and Design Review (DR 11- 017). August 11.

[4] City of Concord, 2011. ZA Order No. 11-008. July 13.

[5] Note that the Zoning Administrator Report for the Approved Lot identifies the Approved Lot as providing an additional 161 spaces. However, the May 4, 2015, plan set provided by Costco for 2014 Project identifies 162 stalls on the ground. The most current count is used here.

[6] Costco Wholesale, 2015. Complete Plan Set. May 4.

[7] California Code of Regulations, Title 14, Division 6, Chapter 3, Article 19. Categorical Exemptions, Section 15301, Class 11, Accessory Structures.

- Use Permit Amendment for modifications to the Approved Project for expansion of the fueling facility, which would include the following components:
  - one (1) additional MPD on the entry side of each of the four (4) existing fuel islands, yielding two additional fueling positions per island for a total of eight (8) additional fueling positions;
  - a 36-foot by 120-foot fueling island canopy addition covering approximately 4,320 square feet that would provide weather protection for the additional MPDs and would match the existing canopy design, colors, and materials;
  - the installation of one (1) 20,000-gallon diesel product underground storage tank (UST) and one (1) 3,500-gallon gasoline/diesel split additive UST[8] and associated product piping;
  - equipping the two (2) fueling islands closest to the Costco warehouse [six (6) MPDs totaling twelve (12) fueling positions] to dispense both gasoline and diesel product;[9] and
  - additional site improvements, including the removal of five (5) parking stalls[10] for the addition of a 800-square-foot water quality bio-retention area.
- Design Review for improvements associated with modifications to the Approved Project including landscaping and gas canopy expansion.

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[8] The existing facility does not provide or store diesel fuel, a noted distinction between the Approved Project and 2015 Project (which would store and provide diesel fuel). This distinction is considered in the analysis presented in this Addendum.

[9] In April 2015, Costco Wholesale revised its Use Permit Amendment application to include this component, as well as revised the size and type of additive UST they had included in their original application.

[10] The 1999 EIR noted that the City of Concord parking ordinance requirement for this type of development was approximately 878 parking spaces, based on a ratio of 4.5 spaces per 1,000 square feet for the Costco store and 2.5 spaces per 1,000 square feet for the residual parking. The 1999 Project was therefore required to supply 878 parking spaces. The 2001 Approved Island did not eliminate any parking spaces from the total parking supply count. With the addition of the Approved Lot in 2001, the total parking space supply for the Approved Project increased to 944 parking spaces. At the time of preparation of this Addendum, the City of Concord Development Code requires 4 parking spaces per 1,000 square feet, which calculates to 641.47 spaces for the 160,368 square-foot Costco warehouse building. With the loss of five parking stalls for the bio-retention area, the total parking supply for the project would be 939 parking spaces, which exceeds the current minimum required stall count of 642 by 297 parking stalls.

The foregoing is hereafter referred to as the "2015 Project."

This Addendum evaluates whether the 2015 Project's proposed expansion of the gas station component of the Approved Project would result in any new or substantially more adverse significant effects or require any new mitigation measures not identified in the 1999 EIR, and concludes that the analysis and the conclusions of the 1999 EIR remain current and valid. No substantial changes have occurred with respect to existing conditions that would cause new or substantially more severe significant environmental effects than were identified in the 1999 EIR, all mitigation measures will remain in place and continue to be enforced, and the Statement of Overriding Considerations remain in effect. No new meaningful information indicates that the proposed modifications would cause new or substantially more severe significant environmental effects than were analyzed in the 1999 EIR.

This Addendum also considers whether any substantial changes have occurred with respect to the circumstances under which the 2015 Project will be undertaken that would require major revisions to the 1999 EIR due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects. As discussed in the following chapter, while there have been regulatory changes since the 1999 EIR (e.g., requirement for an analysis of greenhouse gas emissions), in all instances, the changes in circumstances do not result in new or substantially more severe significant environmental effects or the need for new mitigation measures. This Addendum finds that, notwithstanding changes in circumstances, completion of the 2015 Project would not result in new significant or substantially more severe environmental impacts than those analyzed in the 1999 EIR, and no additional mitigation measures are required.

B. CEQA FRAMEWORK FOR ADDENDUM

The City of Concord is the CEQA lead agency responsible for the Approved Project and the 2015 Project. Since the 2015 Project is a modification to the fueling facility component of the Approved Project, it is subject to subsequent review standards under Public Resources Code Section 21166. Under the California Environmental Quality Act of 1970, Public Resources Code Sections 21000, et seq. and implementing State CEQA Guidelines, Title 14, Chapter 3 of the California Code of Regulations, as amended (collectively, "CEQA"), when a project that was studied and approved under a certified EIR is proposed to be modified, an Addendum to the EIR may satisfy CEQA regulations. Each Public Resources Code Section 21166 and CEQA Guidelines Section 15162 provides that when an EIR has been certified for that project, no subsequent EIR shall be prepared for the project unless the lead agency determines, on the basis of substantial evidence in the light of the whole record, one or more of the following criteria pertain(s):

- **Substantial changes in the project** that require major revisions of the EIR due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects;
- **Substantial changes with respect to the circumstances under which the project is undertaken** which require major revisions of the EIR due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects; or
- **New information of substantial importance**, which was not known and could not have been known with the exercise of reasonable diligence at the time the previous EIR was certified, shows any of the following:

  i) the project will have one or more significant effects not discussed in the previous EIR,

  ii) significant effects previously examined will be substantially more severe than previously shown in the previous EIR,

  iii) mitigation measures or alternatives previously found not to be feasible would in fact be feasible and would substantially reduce one or more significant effects of the project, but the project proponent declines to adopt the mitigation measure or alternative, or

  iv) mitigation measures or alternatives that are considerably different from those analyzed in the previous EIR would substantially reduce one or more significant effects on the environment, but the project proponent declines to adopt the mitigation measure or alternative.

Per CEQA Guidelines Section 15164(a), the lead agency shall prepare an addendum to a previously certified EIR if some changes are necessary but none of the conditions described in CEQA Guidelines Section 15162 calling for the preparation of a subsequent EIR have occurred. As discussed herein, none of the elements requiring preparation of a subsequent EIR exists, and the City of Concord has determined that it is not necessary to prepare a subsequent EIR or MND. Rather, this Addendum to the 1999 EIR is the appropriate CEQA document.

This Addendum reflects the independent judgment and analysis of the City as the lead agency, demonstrates that the environmental analysis, impacts, and mitigation requirements identified in the 1999 EIR remain substantively unchanged by the situation described herein, and supports the finding that the proposed project modifications do not raise any new issues, result in any new impacts, and do not exceed the level of impacts

identified in the 1999 EIR. To support this decision, the following discussion describes the proposed project modifications and the environmental analysis.

Per CEQA Guidelines Section 15164(c), an addendum need not be circulated for public review but can be included in or attached to the Final EIR. Per CEQA Guidelines Section 15164(d), the decision-making body shall consider an addendum to the Final EIR. Accordingly, this Addendum will be attached to the 1999 EIR, and will be considered by the decision-making body with the 1999 EIR before making a decision on the 2015 Project. The 1999 EIR is on file with and may be obtained from the Office of the City Clerk at 1950 Parkside Drive MS/03, Concord, California 94519.

II. PROJECT INFORMATION

A. BACKGROUND

The 2015 Project site is located in the City of Concord and is the site of an existing Costco gas station. The site is bounded by Monument Boulevard to the north; a Public Storage facility to the west; the remainder of the Approved Project site to the south, including the Costco bulk retail/wholesale facility and parking lot; and an ARCO gas station followed by Detroit Avenue to the east. The 2015 Project is a proposed expansion of the gas station built as part of the Approved Project, and is located on a portion of the Approved Project site.

B. SUMMARY OF APPROVED PROJECT AND 2015 PROJECT

In 1999, the City of Concord approved the Costco Wholesale Development project, which proposed an approximately 147,000-square foot bulk retail/wholesale facility, a 5,200-square foot tire center, a 1,075-square foot food court, a three island gas station, and approximately 70,000 square feet of additional commercial/industrial space. The 1999 EIR was prepared and circulated pursuant to CEQA. The 1999 EIR and the associated MMP were approved on December 14, 1999, with the finding that with implementation of all required mitigation measures, the Approved Project would have less-than-significant impacts on the environment, with the exception of a significant and unavoidable environmental impact related to regional emissions. As a result, a Statement of Overriding Considerations was prepared and approved.

The 2015 Project is an expansion of the gas station component of the Approved Project, which was originally approved under Use Permit No. 26-99 in 1999, constructed soon thereafter, subsequently modified by Use Permit Amendment No. 2-01 in 2001, and is currently operational. The 2015 Project would add one (1) additional MPD on the entry side of all each of the four (4) existing fuel islands, yielding two additional fueling positions per island for a total of eight (8) additional fueling position; install one (1) 20,000-gallon diesel product UST and one (1) 3,500-gallon gasoline/diesel split additive UST would be installed, and associated product piping; and equip two (2) fueling islands closest to the Costco warehouse [six (6) MPDs totaling twelve (12) fueling positions] to dispense both gasoline and diesel product. The USTs would require a new vent stack that will be installed within the landscaped area at the northern edge of the site along Monument Boulevard. The aforementioned project components would require the demolition of some existing asphalt and concrete surfaces.

A 36-foot by 120-foot fueling island canopy addition covering approximately 4,320 square feet would be integrated with the existing canopy to provide weather protection for the four additional MPDs. The canopy addition would match the existing canopy design, materials, and color. The Costco Gasoline canopy signage, approximately 27 square feet in size on each canopy façade, would remain on three of the facades, while the signage on the entry façade would be relocated and centered on the canopy addition. Sixteen (16) new LED light fixtures would be installed with the new canopy addition and the twenty-four (24) existing light fixtures under the existing canopy would be replaced with LED fixtures.

The 2015 Project would also incorporate additional site improvements and new landscaping. Specifically, five (5) parking stalls would be removed to add an approximately 800-square-foot water quality bio-retention area landscaped with trees (three would be planted), shrubs, and groundcover, and landscaping would be added along Monument Boulevard to provide screening for the new UST vents that would be installed.

III. ANALYSIS OF POTENTIAL ENVIRONMENTAL EFFECTS

The following discussion analyzes the likelihood of the 2015 Project to result in new or substantially more severe significant impacts or the need for new or different mitigation measures as compared to those studied in the 1999 EIR. This Addendum discusses the topic areas in the sequence that they are addressed in the 1999 EIR. This section concludes by finding that no new or substantially more severe significant effects than those identified in the 1999 EIR would result from 2015 Project and that no new additional or changed mitigation measures would be required.

A. AESTHETICS

The 1999 EIR studied whether the Approved Project, as a whole, would result in a substantial adverse effect on a scenic vista, substantially damage scenic resources within a State Scenic Highway, substantially degrade the visual character or quality of the site, or create a substantial new source of light or glare. The 1999 EIR concluded that the Approved Project would result in three significant impacts, one related to scale and architectural design of the development, and two impacts related to light and glare from the gas station and parking lot. The first impact was mitigated to a less-than-significant level through Mitigations 4.8-1A and 4.8-1B, which required modifications to the project architectural design. The parking lot lighting impact was reduced to a less-than-significant level through design modifications and revision of the lighting or landscaping plan for the parking lot as required by Mitigations 4.8-4A and 4.8-AB. The third impact of gas station lighting on surrounding residents was eliminated through the relocation of the gas station to its current location along Monument Boulevard from its originally proposed location near the Sierra Gardens residential condominium development at the southern edge of the Approved Project site.

Aside from the build out of the Approved Project surrounding and the gas station, the lighting impacts of which are described above, the circumstances under which the 2015 Project would be undertaken have not changed. The land uses surrounding the site are generally consistent with those analyzed in the 1999 EIR (the site is surrounded by commercial and retail uses, and no new residential developments have been constructed in the vicinity). No new information of substantial importance exists that would affect the validity of the 1999 EIR analysis for the 2015 Project. As a result, the 2015 Project would not result in any new or substantially more severe impacts on visual and aesthetic resources and no new mitigation measures are necessary.

2015 Project Parking Lot Lighting: The 2015 Project would not propose any modifications to the Costco building along Detroit Avenue, nor propose any changes to the parking lot

lighting, and as a result would not increase the severity of these previously identified environmental effects.

Gas Station Lighting: The 2015 Project would result in the installation of new lighting (16 new LED light fixtures) with the canopy addition, which would cause an incremental increase in lighting at an operational gas station with 24 existing overhead light fixtures that is surrounded by fully urbanized commercial, retail and industrial uses. As such, lighting added by the 2015 Project would be marginal in comparison to existing surrounding lighting. It would be shielded downward consistent with the existing facility design and the intensity of lighting would not significantly change. The potentially significant impact of the gas station lighting on neighboring residents identified in the 1999 EIR was eliminated prior to construction through relocation of the facility, as described above. Because the 2015 Project does not propose to relocate the gas station, the severity of the potential lighting and glare impact on nearby residents identified in the 1999 EIR would not be increased.

As described in the 1999 EIR, the Approved Project site does not include any State Scenic Highway designations and is not located in the vicinity of a State Scenic Highway. The site is approximately 4.5 miles northeast of the closest designated State Scenic Highways, portions of State Route 24 and Interstate 680 beginning in Walnut Creek. The 1999 EIR also found that the Approved Project site and the vicinity do not include any designated scenic resources. The 2015 Project would be an expansion of the existing gas station that would be contained within the site of the Approved Project, and would expand the existing gas station. The 2015 Project includes a 36-foot by 120-foot fueling island canopy addition to provide weather protection for the additional MPDs. Although this canopy extension would slightly alter the visual character of the existing gas station, the canopy addition would match the existing canopy design, colors, and materials and be of proportionate size. As a result, the modification would not substantially alter the appearance of the existing gas station. The Costco Gasoline canopy signage, approximately 27 square feet in size on each canopy facade, would remain on three (3) of the facades. The signage on the entry facade would be relocated and centered on the canopy after the addition. New address lettering would be added to the canopy per City standards. The proposed MPDs would be installed on the side of the gas station nearest the existing Costco parking lot and would not impact on the existing frontage along Monument Boulevard. As a result, the 2015 Project similarly would not generate any new significant adverse effects on State Scenic Highways, designated scenic resources, or the visual character or quality of the site.

No new or substantially more severe significant aesthetic effects would occur and no additional mitigation measures are required.

B. AGRICULTURE AND FOREST RESOURCES

The 1999 EIR determined that the Approved Project would have no impacts on agricultural resources, and no mitigation measures were required. Specifically, the 1999 EIR found that the Approved Project would neither convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency) to a non-agriculture use or result in the conversion of other farmland to non-agricultural uses, nor would the Approved Project conflict with existing zoning for agricultural use or a Williams Act contract. No active agricultural uses remain at the Approved Project site or within its vicinity, and, as a result, no new potential to convert surrounding farmland to non-agricultural uses exists as a result of the 2015 Project.

The 2015 Project site is part of the larger Approved Project site, and circumstances related to agriculture and forest resources under which the 2015 Project would be undertaken have not changed from those analyzed in the 1999 EIR. As a result, the 2015 Project, similar to the Approved Project, would have no impacts on agricultural resources. The 1999 EIR required no mitigation measures related to agriculture for the Approved Project.

In 2009, the CEQA Guidelines were amended (adopted December 30, 2009, effective March 18, 2010) to include consideration of forest resources and the Environmental Checklist Form (Appendix G) was modified to reflect this amendment. As the 1999 EIR was prepared prior to 2009, it did not consider forest resources. The Approved Project site is not zoned for forest resources and does not contain any forest resources. Therefore, the 2015 Project would not result in a zoning conflict for forest resources, nor would it result in the loss of forest land or conversion of forest land to non-forest use.

No new or substantially more severe significant agriculture or forest resource effects would occur and no additional mitigation measures are required.

C. AIR QUALITY

The 1999 EIR analyzed the potential impacts to air quality that could occur as a result of the 1999 Project (including but not limited to the gas station component). The Approved Island, Approved Lot and 2007 Expansion were approved and constructed subsequent to the completion of the 1999 project and were exempt from environmental review. In the topics analyzed, the 1999 EIR identified two significant impacts on air quality. One impact was related to construction activity. This impact was mitigated to a less-than-significant level through the mitigation measures included in the 1999 EIR. Another significant

impact was due to increased emissions associated with the project. This was identified as a significant and unavoidable impact, as there were no mitigation measures available to reduce the impact to a less-than-significant level. Emissions from the proposed fueling station were predicted to identify any substantial changes to these findings. Impacts associated with emissions of toxic air contaminants (TACs) were evaluated in the 1999 EIR and found to be less than significant. Since that 1999 EIR, the State has identified the toxicity of diesel exhaust and the Bay Area Air Quality Management District (BAAQMD) has modified their procedures for evaluating risk from TACs both through the permitting process and their updated CEQA Air Quality Guidelines[11,12]. The proposed project would attract diesel-fueled vehicles and trucks. In addition, benzene that is found in gasoline is a TAC. Gasoline stations, particularly large fueling stations, are a source of TACs due to evaporative benzene emissions from the storage and handling of gasoline. BAAQMD's new procedures for evaluating cancer risk from TACs consider the greater affect these contaminants have on infants and children. These effects were not evaluated in the 1999 EIR. Therefore, emissions of TACs from the proposed project are evaluated consistent with the modified procedures. Roadside carbon monoxide concentrations were predicted and found to be below ambient air quality standards. Since the time of that 1999 EIR analysis, carbon monoxide concentrations in the Bay Area have decreased substantially due to greatly reduced tailpipe emission rates. As a result, the project would not cause or contribute to violations of a carbon monoxide ambient air quality standard.[13]

During the period 2009 through 2011, BAAQMD conducted a public process to update their CEQA Air Quality Guidelines. In 2010, BAAQMD published draft thresholds of significance in a report that included the scientific reasoning for establishing those significance thresholds[14]. BAAQMD adopted CEQA Air Quality Guidelines in 2011 that included thresholds of significance15. BAAQMD's adoption of significance thresholds contained in the *2011 CEQA Air Quality Guidelines* was called into question by an order issued March 5, 2012, in California Building Industry Association (CBIA) v. BAAQMD

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[11] BAAQMD. 2012. *Recommended Methods for Screening and Modeling Local Risks and Hazard*. May.

[12] BAAQMD, 2011. *BAAQMD CEQA Air Quality Guidelines*. May.

[13] For a land-use project type, the BAAQMD CEQA Air Quality Guidelines state that a proposed project would result in a less than significant impact to localized carbon monoxide concentrations if the project would not increase traffic at affected intersections to more than 44,000 vehicles per hour. Peak-hour traffic volumes in the project area would be well below this level.

[14] BAAQMD. 2010. *California Environmental Quality Act Guidelines Update - Proposed Thresholds of Significance*

May 3, 2010

[15] BAAQMD, 2011. *BAAQMD CEQA Air Quality Guidelines*. May.

(Alameda Superior Court Case No. RGI0548693). The order required BAAQMD to set aside its approval of the thresholds until it has conducted environmental review under CEQA. The ruling made in the case concerned the environmental impacts of adopting the thresholds and how the thresholds would indirectly affect land use development patterns. In August 2013, the Appellate Court struck down the lower court's order to set aside the thresholds. However, this litigation remains pending as the California Supreme Court recently accepted a portion of CBIA's petition to review the appellate court's decision to uphold BAAQMD's adoption of the thresholds. The specific portion of the argument to be considered is in regard to whether CEQA requires consideration of the effects of the environment on a project (as contrasted to the effects of a proposed project on the environment). The remaining legal arguments are not considered to affect this project. Therefore, the significance thresholds contained in the *BAAQMD's May 2011 CEQA Air Quality Guidelines* are applied to this project

Evaluation of Project Emissions

The Bay Area is currently considered a non-attainment area for ground-level ozone and fine particulate matter ($PM_{2.5}$) under both the Federal Clean Air Act and the California Clean Air Act. The area is also considered non-attainment for respirable particulates or particulate matter with a diameter of less than 10 micrometers (PM_{10}) under the California Clean Air Act, but not the Federal act. The area has attained both State and Federal ambient air quality standards for carbon monoxide. As part of an effort to attain and maintain ambient air quality standards for ozone and particulate matter (i.e., PM_{10} and $PM_{2.5}$), the BAAQMD has established updated thresholds of significance for these air pollutants and their precursors. These thresholds are for ozone precursor pollutants (ROG and NO_x), PM_{10}, and $PM_{2.5}$. Emission-based thresholds apply to both construction period and operational period impacts.

The 2015 Project is the expansion of the existing gas station that would result in increased traffic, additional truck deliveries, and the attraction of diesel vehicles to the new diesel fuel pumps. This new traffic would lead to increased pollutant emissions. The storage and transfer of gasoline, although controlled through implementation of special equipment prescribed by BAAQMD, results in emission of air pollutants (i.e., ROG).

Due to the size of the 2015 Project, construction exhaust emissions would be less than significant. In the 2011 update to the BAAQMD CEQA Air Quality Guidelines, BAAQMD identified the size of land use projects that could result in significant air pollutant emissions. For construction exhaust impacts, the gasoline station size was identified at 277,000 square feet. The proposed project would be much smaller and not include any substantial earthwork.

Air pollutant emissions associated with operation of the project was computed based on these three primary sources:

- Tailpipe emissions from new vehicle trips generated by the project;
- Tailpipe emissions from vehicles idling in queues waiting to access pumps; and
- Evaporative emissions from the transfer and storage of gasoline (i.e., underground tank filling, tank breathing and vehicle fueling and spillage).

The California Emissions Estimator Model, Version 2013.2.2 (CalEEMod) was used to predict project emissions. Operational emissions, included primarily those from traffic and energy usage, are predicted by the model. Daily traffic generation (see the *Transportation/Traffic* section of this Addendum) were input to the model, which are based on traffic counts and the number of fuel dispensing pumps associated with the fueling station.[16] The trip generation rates include adjustments for internalization and passby trips. No diverted trips were assumed for this analysis. Default trip lengths and vehicle type were used in the analysis. Other model defaults for area sources, energy usage water consumption and waste generation were assumed. Operation of the 2015 Project was assumed for 2016. The CalEEMod modeling output is provided in *Appendix A.*

The CalEEMod model does not account for additional emissions due to vehicle queuing that could occur during certain peak hours at the fueling station. However, the traffic study performed for this Addendum (see *Transportation/Traffic*) shows a decrease in queuing at the station as a result of the 2015 Project. Idling emissions, due to vehicle queuing were considered to be negligible compared to vehicle trip emissions.

The transfer and storage of gasoline results in emissions of organic compounds, referred to as total organic compounds (TOG). These TOG emissions are assumed to be same as reactive organic gases or ROG. These gases, when combined with nitrogen oxides (NO_x) lead to ozone formation. ROG emissions for the proposed gas station were computed based on recent emission factors developed by CARB.[17] The emission factors are based on annual gasoline throughput and account for emissions from fuel storage tank loading and pressure driven (breathing) losses, motor vehicle refueling, spillage while refueling, and minor emissions from vapor permeation through gasoline dispensing hoses. The fueling

[16] Kittelson & Associates, Inc., 2015. Memo to Urban Planning Partners: Concord Costco Gasoline Fuel Station Expansion Vehicle Trip Generation and Queuing Summary. January 20.

[17] CARB. 2013. Revised Emissions Factors for Gasoline Marketing Operations at California Gasoline Dispensing Facilities. December 23, 2013.

emission factors take into account the effects of vehicles equipped with onboard refueling vapor recovery (ORVR) systems. ORVR systems were phased in beginning with 1998 model year passenger vehicles, and are now installed on all passenger, light-duty, and medium-duty vehicles manufactured since the 2006 model year. Emissions were calculated based on a maximum annual throughput of 21.6 million gallons per year, which, according to Costco, is the maximum throughput allowed in the BAAQMD permit for this facility. Emission calculations from transfer and storage of gasoline are provided in *Appendix B*.

Table 1 provides annual and average daily emissions of air pollutants associated with the fueling station. As shown, the change in emissions would be below the significance thresholds, and thus, the impact would be less-than-significant.

TABLE 1. COSTCO FUELING STATION PROJECT OPERATIONAL EMISSIONS

Emission Source	ROG or VOC	NO_x	PM_{10} Exhaust	$PM_{2.5}$ Exhaust	CO_2e[1]
Existing Fuel Station Emissions					
Motor vehicles (from CalEEMod) in tons	2.37	4.48	0.05	0.05	2,965
Evaporative gasoline emissions in tons	5.66	0.00	0.00	0.00	0
Total Annual Emissions in tons	8.03	4.48	0.05	0.05	2,965
Existing *Plus* Project Emissions					
Motor vehicles (from CalEEMod) in tons	2.60	4.90	0.06	0.05	3,247
Evaporative gasoline emissions in tons	5.66	0.00	0.00	0.00	0
Total Annual Emissions in tons	8.26	4.90	0.06	0.05	3,247
Net Change	**0.23**	**0.42**	**0.01**	**<0.01**	**282**
BAAQMD Thresholds (tons/year)	**10**	**10**	**15**	**10**	**1,100**
Significant?	**No**	**No**	**No**	**No**	**No**
Change in Daily Emissions (lb/day)[2]	**1.26**	**2.3**	**<0.1**	**<0.1**	--
1999 EIR Thresholds (lbs/day)	**80**	**80**	**80**	**None**	--
2011 BAAQMD Thresholds (lbs/day)	**54**	**54**	**82**	**54**	--
Significant?	**No**	**No**	**No**	**No**	--

[1] Reported in metric tons. Emissions of CO_2e are discussed in *Section III.G., Greenhouse Gas Emissions*.

[2] Assuming 365 days of operation

Source: Illingworth & Rodkin, 2015.

Evaluation of Community Risk Impacts

Toxic Air Contaminants (TACs) are a broad class of compounds known to cause morbidity or mortality (usually because they cause cancer or serious illness) and include, but are not limited to, criteria air pollutants. TACs are found in ambient air, especially in urban areas, and are caused by industry, agriculture, fuel combustion, and commercial operations (e.g., dry cleaners). TACs are typically found in low concentrations, even near their source (e.g., diesel particulate matter near a highway). Because chronic exposure can result in

adverse health effects, TACs are regulated at the regional, state, and federal level. The identification, regulation, and monitoring of TACs is relatively new compared to that for criteria air pollutants that have established ambient air quality standards. TACs are regulated or evaluated on the basis of risk to human health rather than comparison to an ambient air quality standard or emission-based threshold.

Diesel exhaust, in the form of diesel particulate matter (DPM), is the predominant TAC in urban air with the potential to cause cancer. It is estimated to represent about two-thirds of the cancer risk from TACs (based on the statewide average). According to the California Air Resource Board (CARB), diesel exhaust is a complex mixture of gases, vapors, and fine particles. This complexity makes the evaluation of health effects of diesel exhaust a complex scientific issue. Some of the chemicals in diesel exhaust, such as benzene and formaldehyde, have been previously identified as TACs by the CARB, and are listed as carcinogens either under the State's Proposition 65 or under the federal Hazardous Air Pollutants programs. California has adopted a comprehensive diesel risk reduction program. The U.S. Environmental Protection Agency (EPA) and the CARB adopted low-sulfur diesel fuel standards in 2006 are designed to reduce diesel particulate matter substantially. The CARB recently adopted new regulations requiring the retrofit and/or replacement of diesel construction equipment, on-highway diesel trucks, and diesel buses in order to lower fine particulate matter ($PM_{2.5}$) emissions and reduce state-wide cancer risk from diesel exhaust.

Gasoline-powered vehicles, particularly light-duty autos and trucks emit TACs mostly in the form of total organic gases (TOG). TOG emissions associated with these types of vehicles occur primarily in two forms: running exhaust and evaporative running losses. Additional TOG emissions occur when starting a vehicle, especially cold vehicles. Mobile source TOG includes TACs such as benzene, 1,3-Butadiene and formaldehyde. Emissions of these TACs are controlled through requirements of motor vehicle exhaust systems and the formulation of gasoline by the U.S. EPA and CARB. Benzene is a fundamental component of gasoline and diesel fuel as well as vehicle exhaust. Benzene is emitted through the evaporation of gasoline vapors. Since it is known to cause cancer in humans, benzene was classified as a TAC in 1984 by CARB. Benzene emissions from fuel use are regulated in numerous ways that include standards for the formulation of gasoline, vehicle emission standards, and vapor control systems for storage, fuel dispensing facilities and vehicle on-board fuel systems.

Particulate matter in excess of state and federal standards represents another challenge for the Bay Area. Elevated concentrations of $PM_{2.5}$ are the result of both region-wide (or cumulative) emissions and localized emissions. High particulate matter levels aggravate respiratory and cardiovascular diseases, reduce lung function, increase mortality (e.g., lung cancer), and result in reduced lung function growth in children.

Emissions of TACs potentially associated with the 2015 Project were estimated using various emissions models. Concentrations of these pollutants in the ambient air are estimated using the ISCST3 dispersion model. Modeling allows the estimation of both short-term and long-term average concentrations in air for use in a health risk assessment, accounting for site specific terrain and meteorological conditions. Health risks potentially associated with the estimated concentrations of pollutants in the air are characterized in terms of excess lifetime cancer risks (for carcinogenic substances), or comparison with reference exposure levels (RELs) for non-cancer health effects (for non-carcinogenic substances). A REL is a concentration in the air at or below which no adverse health effects are anticipated. RELs are based on the most sensitive adverse effects reported in the medical and toxicological literature.

Health risks were evaluated for a maximum exposed individual (MEI). Health risks were predicted over a receptor grid that represents all sensitive receptors in the area (residences, schools, etc.). The MEI is located at the maximum impact sensitive receptor (sensitive receptors are described below). Impacts are judged based on predictions at the MEI. Health risks potentially associated with concentrations of carcinogenic air pollutants were calculated as estimated excess lifetime excess cancer risks. The excess lifetime cancer risk for a pollutant is estimated as the product of a lifetime dose and the cancer potency factor derived by the California Office of Environmental Health Hazard Assessment (OEHHA). In other words, it represents the increased cancer risk associated with an almost continuous exposure to concentrations of toxic air contaminants in the air over a 70-year lifetime.

Evaluation of potential non-cancer health effects from exposure to short-term and long-term concentrations in the air was performed by comparing modeled concentrations in air with the RELs. Potential non-cancer effects were evaluated by calculating a ratio of the modeled concentration in the air and the REL. This ratio is referred to as a hazard index. The cancer potency factors, unit risk values and RELs used to characterize health risks associated with modeled concentrations in the air were based on information from the BAAQMD and the OEHHA.

There are groups of people more affected by air pollution than others. CARB has identified the following persons who are most likely to be affected by air pollution: children under 14, the elderly over 65, athletes, and people with cardiovascular and chronic respiratory diseases. These groups are classified as sensitive receptors. Locations that may contain a high concentration of these sensitive population groups include residential areas, hospitals, daycare facilities, elder care facilities, elementary schools, and parks. For cancer risk assessments, children are the most sensitive receptors, since they are more susceptible to cancer causing TACs. Residential locations are assumed to include infants and small children. The area surrounding the project site is predominantly commercial and industrial. The closest sensitive receptors are residences located about 250 feet

northwest of the gas station in the Vista Del Monte mobile home park on the north side of Monument Boulevard. These residential receptor locations are shown in Figure III.C.

Since the 1999 EIR, BAAQMD adopted significance thresholds to evaluate localized impacts from emissions of TACs. The BAAQMD identified significance thresholds for exposure to TACs and $PM_{2.5}$ as part of its May 2011 *CEQA Air Quality Guidelines.*[18] As discussed previously this report uses the thresholds and methodologies from BAAQMD's May 2011 *CEQA Air Quality Guidelines* to determine whether there would be any project health risk impacts. This report addresses single-source (operational) impacts to nearby off-site receptors. The following are the significance criteria used to evaluate the 2015 Project's impacts:

Single-Source Impacts. If emissions of TACs or $PM_{2.5}$ exceed any of the thresholds of significance listed below, the project would result in a significant impact and mitigation would be required.

- An excess cancer risk level of more than 10 in 1 million, or a non-cancer (chronic or acute) hazard index greater than 1.0.
- An incremental increase of more than 0.3 micrograms per cubic meter ($\mu g/m^3$) annual average $PM_{2.5}$.

Cumulative-Source Impacts. A project would have a cumulatively considerable impact if the aggregate total of all past, present, and foreseeable future sources within a 1,000 foot radius of the fence line of a source or from the location of a receptor, plus the contribution from the project, exceeds the following thresholds.

- An excess cancer risk levels of more than 100 in one million or a chronic non-cancer hazard index (from all local sources) greater than 10.0.
- 0.8 $\mu g/m^3$ annual average $PM_{2.5}$.

Local traffic generated by the project along with evaporative emissions from gasoline fueling could lead to operational community risk impacts. Specific sources of emissions

[18] BAAQMD, 2011. *BAAQMD CEQA Air Quality Guidelines*. May.

FIGURE 1 – SENSITIVE RECEPTOR LOCATIONS AND PROJECT VEHICLE TRAVEL ROUTES

include traffic traveling to and from the project, traffic idling at the project, truck traffic accessing the site (importing fuel) and evaporative emissions of fuel from transfer and storage of gasoline (i.e., underground tank filling, tank breathing and vehicle fueling and spillage). Impacts from each of these sources are addressed. These sources are assumed to be operational well into the future (i.e., 70 years). The year 2016 was assumed to be the first full year of operation and was used as the year of analysis for generating emission rates. Emission rates are anticipated to decrease in the future due to improvements in exhaust systems and turnover of the fleet from older, more polluting vehicles, to newer cleaner vehicles.

2015 Project Traffic

As discussed in the *Transportation/Traffic* section of this Addendum and in *Appendix C*, the existing fueling station plus 2015 Project would generate approximately 6,519 average daily trips, of which 326 would be new diesel customers. The primary TACs of concern from 2015 Project traffic are new diesel and non-diesel mobile source air toxics found in TOG. This includes diesel particulate matter (or DPM) and 14 different toxic components of TOG running exhaust emissions. In addition, evaporative emissions of TOG from vehicles emit five different toxic components. The EMFAC2011 emission factor model provided emission rates of $PM_{2.5}$, DPM ($PM_{2.5}$ exhaust from diesel vehicles) TOG for running exhaust and TOG evaporative loss emissions. All vehicles using the fueling station were assumed to be light-duty autos, light-duty trucks or medium-duty trucks and vehicles. The percentage breakdown was based on the San Francisco Bay Area fleet average as reported by EMFAC2011. BAAQMD has developed weighted toxicity values for tailpipe and evaporative losses that incorporates the individual toxicity of each compound that make up TOG.[19] The summation of all of the individual weighted toxicity values developed by BAAQMD is then cumulatively weighted and applied in the risk and hazard calculations. $PM_{2.5}$, DPM, and TOG emission rates used in the analysis are provided in *Appendix B*.

Idling emissions due to vehicles queuing were computed using the EMFAC2011 motor vehicle emission factor model. Idle emissions were computed by converting 5 mile-per hour exhaust $PM_{2.5}$ and TOG emissions rates into hourly emissions. The traffic report predicted an average of 85 vehicle queuing hours per day with the 2015 Project. Annual emissions assumed similar operating conditions 365 days per year. Evaporative TOG emissions from queuing were calculated in a similar manner. The analysis of queuing

[19] BAAQMD. 2012. Recommended Methods for Screening and Modeling Local Risks and Hazard. May.

TOG, DPM, and $PM_{2.5}$ emissions is also provided in *Appendix B*.

Assuming an annual throughput that is equivalent to the maximum throughput allowed under BAAQMD permit conditions, there would be 11 to 13 truck delivery trips per day. This estimate is based on a permitted maximum throughput of 21.6 million gallons per year and a capacity of 9,000 gallons per truck delivery.[20] These deliveries were assumed to be made by heavy-duty diesel trucks. The TAC of concern from trucks is DPM. $PM_{2.5}$ is the air pollutant of concern that is addressed in community risk assessments. The CARB EMFAC2011 model was used to predict $PM_{2.5}$ emission rates from these trucks. DPM, the TAC of concern, is considered to be all $PM_{2.5}$ running exhaust, whereas total $PM_{2.5}$ includes exhaust, brake wear and tire wear. Emission rates for truck traffic are also included as *Appendix B*.

Fueling Emissions

As previously described, emissions of ROG (assumed to be the same as TOG) were computed based on the maximum allowable throughput of gasoline (i.e., 21.6 million gallons). Emissions of TOG and benzene, which is a TAC, were computed using CARB emission factors for gasoline dispensing facilities and assuming that benzene makes up 0.3 percent of gasoline vapor.[21] Total benzene emissions were calculated at 33.9 pounds per year. The modeling assumed the fuel station would operate 17 hours per day between 5:00 a.m. and 10:00 p.m., 365 days per year. *Appendix B* includes emissions of fueling storage and transfer TOG and benzene emissions.

Dispersion Modeling

The U.S. EPA ISCST3 dispersion model was also used to predict concentrations of TOG, DPM, $PM_{2.5}$, and benzene from operation of the 2015 Project at off-site sensitive receptors in the vicinity of the project site. Modeling was conducted using a 5-year (2001-2005) hourly meteorological data set from the Concord Sewage Treatment Plant prepared for use with the ISCST3 model by the BAAQMD.

Truck and other vehicle emissions were modeled as line sources (a series of volume sources along a line) representing on-site and off-site travel routes. It was conservatively

[20] Personal correspondence with Matt Cyr of Barghausen Consulting Engineers, Inc. January 20, 2015.

[21] CAPCOA. 1997. Air Toxics "Hot Spots" Program, Gasoline Service Station Industrywide Risk Assessment Guidelines, November 1997

assumed that all vehicles traveling to and from the gas station would travel along Monument Boulevard. Emissions from a 2,200 foot section of Monument Boulevard adjacent to the project site were modeled, with the modeled roadway extending about 1,100 feet away from the site in each direction. Due to the limited ability for traffic traveling from the northeast to the southwest on Monument Boulevard to access the Costco site (i.e., a center divider strip with no turn lane in/out of the Costco parking lot), only the southwest to northeast travel lanes were modeled. Off-site vehicles were assumed to be traveling at an average speed of 20 mph. On-site travel to the gas station was assumed to enter the Costco parking lot from Monument Boulevard then travel through the parking lot to the station and finally exit the station and travel back through the parking lot and exit the site to Monument Boulevard. On-site vehicle travel was assumed to at 5 mph. The off-site and on-site travel routes included in the modeling are shown in Figure III.C. Emissions due to vehicle idling were modeled as a single volume source located in the station's approach queue area and the pump area itself. Emission release heights for the volume sources modeled were assumed to be 1.3 meters (4.3 feet).

Benzene emissions from the fuel station were modeled using volume sources as recommended by CAPCOA. Eight volume sources with side lengths of 10 meters (33 feet) and a 4 meter (13 feet) height were used. Four of the volume sources were used to represent vehicle fueling emissions with a release height of 1 meter and the other four volume sources represented the emission from fuel spillage and dispensing hose permeation and used a release height of 0 meters. Emissions from fuel storage tanks were included in the volume sources for refueling. The fuel station emissions and queuing emissions were modeled as occurring 17 hours per day.

TOG, DPM, $PM_{2.5}$, and benzene concentrations were predicted at the closest sensitive receptors (residences) near the project site at a height of 1.5 meters (5 feet). Modeled vehicle routes, receptors, and location of maximum impacts are shown in Figure III.C. Dispersion modeling information for these sources is included in *Appendix B*.

Cancer Risk, $PM_{2.5}$ and Hazards

Using the maximum modeled DPM, TOG and benzene concentrations, individual cancer risks were computed using the most recent methods recommended by BAAQMD including nearly continuous exposures. Based on modeled TAC concentrations, cancer risks were calculated for a 70-year exposure assuming constant emissions at 2016 levels over the

entire 70 year period for residences. A cancer risk adjustment factor of 1.7 was applied to residential exposures to account for age sensitivity.[22]

Table 2 shows the excess cancer risk, annual PM2.5 concentration and acute or chronic hazards associated with existing conditions, existing plus project, and net increase in health risks at the location of the residential MEI. In addition, other substantial sources of TACs located within 1,000 feet of the project site are included. The net increase in excess cancer risk associated with project operation would be less than 2.0 chances per million. The maximum annual $PM_{2.5}$ concentration increase would 0.01 μg/m^3. These levels are below the significance thresholds for cancer risk and annual $PM_{2.5}$ concentrations. The predicted Hazard Index is well below the significance threshold.

Summary of Impacts

This analysis found that the TAC emissions from operation of the proposed project would not exceed the thresholds of significance for community risk impacts in terms of excess lifetime cancer risk, annual $PM_{2.5}$ concentrations and Hazard Index. Both single-source and cumulative-source thresholds for community risk would not be exceeded. As a result, the 2015 Project would have a less than significant impact in terms of exposing sensitive receptors to substantial air pollutant concentrations.

[22] Bay Area Air Quality Management District (BAAQMD), 2010, *Air Toxics NSR Program Health Risk Screening Analysis Guidelines*, January.

TABLE 2. COSTCO FUELING STATION COMMUNITY RISK IMPACTS

	Community Risk Impact		
Receptor/Source	**Excess Cancer Risk (per million)**	**Annual $PM_{2.5}$ Concentration ($\mu g/m^3$)**	**Hazard Index (highest of Acute or Chronic)**
	Project at MEI		
Existing Project Health Risks			
Traffic (on- and off-site vehicle trips & idling)	0.6	0.02	<0.01
Benzene (from fuel evaporation)	0.4	0.00	<0.01
Total	1.0	0.02	<0.01
Existing *Plus* Project Health Risks			
Traffic (on- and off-site vehicle trips & idling)	2.6	0.03	<0.01
Benzene (from fuel evaporation)	0.4	0.00	<0.01
Total	3.0	0.03	<0.01
Net Change	**2.0**	**0.01**	**<0.01**
Significance Threshold (Project)	*10*	*0.3*	*1.0*
	Cumulative Sources at MEI		
Monument Blvd. traffic[1]	4.3	0.17	<0.03
World Oil Marketing Company #26 (Plant G6899)[2]	1.6	<0.04	0.00
ARCO Service Station (Plant G5954) at over 450 feet[2]	3.2	<0.08	0.00
Monument Cleaners (Plant 7662) at over 800 feet	<12.4	<0.03	0.00
Maximum Cumulative including Project	**<25.5**	**<0.32**	**<0.03**
Significance Threshold (Cumulative)	*100*	*0.8*	*10.0*
Significant?	***No***	***No***	***No***

[1] Based on BAAQMD Roadway Screening Analysis Tables for North-South Roadway with 40,000 ADT at 10 feet.
[2] Based on BAAQMD Google Earth Stationary Source Screening Analysis Tool and Distance Adjustment Multiplier Tool for Gasoline Dispensing Facilities at 450 feet.

D. BIOLOGICAL RESOURCES

The 1999 EIR analyzed the potential impacts to biological resources that could occur as a result of the Approved Project (including but not limited to the gas station component). In the topics analyzed, the 1999 EIR determined that the Approved Project would have three significant impacts on biological resources. One impact was related to the loss of potential breeding habitat for migratory birds and potential roosting habitat for special-status bat species due to tree removal and the demolition of previously existing buildings. The other two impacts were on water quality in Pine Creek due to construction activities and runoff from the gas station and parking lot. These impacts were mitigated to a less-than-significant level through the mitigation measures included in the 1999 EIR.

The 2015 Project is the expansion of the existing gas station. The 2015 Project site is part of the Approved Project site. The trees and buildings discussed in the 1999 EIR have since been removed, the 2015 Project site was disturbed and developed in connection with the Approved Project construction and is subject to ongoing operations, it contains limited vegetation and no valuable habitat. The 2015 Project would add three trees and would not involve tree removal. As a result, the 2015 Project would not worsen the severity of any impacts or result in any new significant impacts related to the loss of special status species or potential habitat for special status species than those previously identified in the 1999 EIR and subsequently mitigated.

The 2015 Project proposes the addition of new MPDs, USTs, a canopy addition, and updated landscaping, the implementation of which would modify approximately one percent of the site by grading. Existing asphalt and concrete surfaces would be modified, and cuts and fills on site would range from approximately 0 to 18 feet in depth to accommodate construction and installation of the project components. These cuts and fills do not correspond to site grading but rather installation of the three USTs. Overall, approximately 995 cubic yards of dirt would be moved during the process. All of the construction contemplated under the Approved Project and evaluated in the 1999 EIR for the gas station component was executed. This construction therefore would be new construction. However, it represents a small fraction of the construction proposed and completed by the Approved Project. The 1999 EIR required the preparation of Storm Water Pollution Prevention Plan (SWPPP) as mitigation and that topsoil and equipment be located in areas where runoff to Pine Creek would not occur. The 2015 Project could further minimize water quality impacts to Pine Creek as the new bio-retention area would treat over 10,000 square feet of impervious surface where there was no treatment before. This mitigation measure was implemented as a condition of project approval to reduce the adverse impact of construction on Pine Creek water quality to a less-than-significant level. The 2015 Project would also be required to develop and implement a Storm Water Pollution Prevention Plan (SWPPP), a California regulatory requirement under the State Water Resources Control Board's Construction General Permit, as discussed further in

Section III.I, Hydrology and Water Quality. Given the relatively small scale of the construction, this would ensure that any adverse impact resultant of construction is mitigated to a less-than-significant level and ensure no increased severity in the previously identified effect and no new significant environmental effects.

The 1999 EIR required mitigation to reduce the impact of pollutant runoff from the gas station to Pine Creek to a less-than-significant level. Mitigation 4.5-5A and 4.5-5B required the installation of oil/water separators in the storm drain system and the preparation of a containment plan to prevent runoff of oil, grease, and pollutants into Pine Creek. The 2015 Project is an expansion of the existing gas station and would be served by the existing oil/water separators and containment plan. It is not anticipated that the addition of MPDs to the fueling area will increase the volume of fuel discharge, so no changes to the existing oil/water separator will be necessary to accommodate the 2015 Project. There are shutoff measures in place at the dispensers to prevent spillage. The containment plan that is currently in place will be sufficient to accommodate the 2015 Project.[23] As a result, no increase in the severity of the previously identified impact or creation of any new impacts related to pollutant runoff would result. The provision of diesel, newly incorporated as part of the 2015 Project, would not affect existing mitigations.[24]

Overall, the circumstances under which the Approved Project was undertaken have changed in that the Approved Project site and its immediate vicinity are further disturbed by development than was originally analyzed in the 1999 EIR. Given this further disturbance and development, biological resources are less likely to be present on site in its vicinity and no new impacts on biological resources are expected to occur as a result of the 2015 Project.

No new or substantially more severe significant biological resource effects would occur and no additional mitigation measures are required.

E. CULTURAL RESOURCES

The 1999 EIR analyzed the potential impacts to cultural resources that could occur as a result of the Approved Project. The 1999 EIR determined that construction of the

[23] Stubbs, Keith, Barghausen Consulting Engineers, Inc., on behalf of Costco Wholesale, 2015. Personal communication with Urban Planning Partners, May 19.

[24] Cyr, Matt, Project Planner, Barghausen Consulting Engineers, Inc., on behalf of Costco Wholesale, 2015. Personal communication with Urban Planning Partners, May 19.

Approved Project could have one potentially significant impact on historic and/or archaeological resources, which would be reduced to a less-than-significant level with mitigation. Mitigation 4.9-1A and 4.9-1B required that work be halted if cultural resources were encountered during grading or excavation, and that construction cease and further investigation occur if human remains were found. These mitigations were incorporated as conditions of project approval, and would be similarly incorporated as conditions of approval for the 2015 Project. Given, however, that the 2015 Project is the expansion of an existing gas station that was constructed on the same site through the grading and excavation undertaken as part of the Approved Project, and that the 2015 Project would involve cuts and fills at an approximate maximum depth of 18 feet, it is unlikely that any ground that was not previously disturbed by construction of the Approved Project would be disturbed by the 2015 Project's construction, and that any cultural resources not already uncovered would be found. As a result, no new or substantially more severe significant effects related to cultural resources are expected to occur as a result of the 2015 Project.

No new or substantially more severe significant cultural resource effects would occur and no additional mitigation measures are required.

F. GEOLOGY AND SOILS

The 1999 EIR found, based on the Initial Study completed, no significant impacts related to geology and soils for the Approved Project. The Approved Project site is located approximately ¼ mile west of the Concord fault and approximately 14 and 33 miles east of the Hayward and San Andreas faults, respectively. The site is not located within an Alquist-Priolo Earthquake Fault Zone and no mapped faults are known to traverse the site. The Initial Study identified that the Approved Project site would be subjected to major shaking during the life of the project but that buildings would be designed in accordance with applicable seismic provisions of the building codes. The Initial Study also identified low potential for liquefaction, landslide, mudflow, and erosion, and no unique geologic or physical features on the site.

The 2015 Project is an expansion of the gas station component of the Approved Project within the existing site, which was studied and found to have no significant adverse effects related to geology and soils; the 2015 Project is not expected to have any significant impact related to geology and soils. Furthermore, the 2015 Project would be subject to applicable provisions of seismic building codes.

No new or substantially more severe significant geology and soils effects would occur and no additional mitigation measures are required.

G. GREENHOUSE GAS EMISSIONS

The 1999 EIR did not address greenhouse gas (GHG) emissions associated with the project, since guidance to evaluate such impacts had not yet been established. In June 2010, BAAQMD adopted thresholds of significance to assist in the review of GHG emissions impacts under CEQA. These thresholds were designed to establish the level at which BAAQMD believed GHG emissions would cause significant environmental impacts under CEQA and were posted on BAAQMD's website and included in the Air District's updated CEQA Guidelines (May 2011). It is important to note that while the CEQA requirement was imposed after the 1999 EIR was adopted, global warming has been known since the 1970s. That information, together with information about potential impacts relating to global warming caused by GHGs, was available at the time the 1999 EIR was adopted and thus is not "new information of substantial importance which was not known and could not have been known" at the time of the adoption of the 1999 EIR.

The significance thresholds identified by BAAQMD are as follows:

1. Compliance with a Qualified GHG Reduction Strategy or
2. Emissions of 1,100 metric tons or 4.6 metric tons per capita

BAAQMD's adoption of significance thresholds contained in the 2011 CEQA Air Quality Guidelines were called into question by an order issued March 5, 2012, in California Building Industry Association (CBIA) v. BAAQMD (Alameda Superior Court Case No. RGI0548693). The order requires BAAQMD to set aside its approval of the thresholds until it has conducted environmental review under CEQA. The ruling made in the case concerned the environmental impacts of adopting the thresholds and how the thresholds would indirectly affect land use development patterns. In August 2013, the Appellate Court struck down the lower court's order to set aside the thresholds. However, this litigation remains pending as the California Supreme Court recently accepted a portion of CBIA's petition to review the appellate court's decision to uphold BAAQMD's adoption of the thresholds. The specific portion of the argument to be considered is in regard to whether CEQA requires consideration of the effects of the environment on a project (as contrasted to the effects of a proposed project on the environment). Therefore, the significance thresholds contained in the 2011 CEQA Air Quality Guidelines are applied to this project.

The City of Concord's Climate Action Plan, adopted in July 2013, serves as a Qualified GHG Reduction Strategy or a community-wide plan to reduce GHG emissions in accordance with the goals of Assembly Bill 32 (AB 32) and BAAQMD CEQA Air Quality Guidelines. A Scoping Plan for AB 32 was adopted by CARB in December 2008. It contains the State of California's main strategies to reduce GHGs from business-as-usual emissions projected in 2020 back down to 1990 levels. Business-as-usual (BAU) characterizes the

projected emissions in 2020, including increase in emissions caused by growth, without any GHG reduction measures. The Scoping Plan has a range of GHG reduction actions, including direct regulations, alternative compliance mechanisms, monetary and non-monetary incentives, voluntary actions, and market-based mechanisms such as a cap-and-trade system.

One purpose of the Qualified GHG Reduction Strategy is to streamline the decision-making process regarding a proposed project's impact on GHG emissions within the City. The project would not require a General Plan Amendment. The project is subject to relevant Climate Action Plan measures. The project does not conflict with any of the Climate Action Plan policies. It is noted that given the type and small size of the project, none of the policies or programs would be directly applicable to the project. As a result, the project would be considered consistent with the City's adopted Climate Action Plan and would result in less-than-significant impacts with respect to GHG emissions.

As detailed in *Section III.C, Air Quality*, GHG emissions associated with the project were computed using the CalEEMod model and are summarized here for informational purposes only. As shown in Table 1 (see Table 1, Costco Fueling Station Project Operational Emissions of *Section III.C, Air Quality*), expansion of the facility under the proposed project would increase emissions by 282 metric tons of equivalent carbon dioxide (CO_2e)[25]. This modeled increase in emissions is well below the BAAQMD "bright line" significance threshold of 1,100 metric tons per year. Because the project would be constructed in a community that has adopted a qualified GHG Reductions Strategy, and the project itself would not cause emissions to exceed 1,100 metric tons annually, the impact of the project related to GHG emissions would be less than significant.

H. HAZARDS AND HAZARDOUS MATERIALS

The 1999 EIR analyzed the potential impacts to hazards and hazardous materials that could occur as a result of the Approved Project and identified no significant impacts. The 1999 EIR discussed the potential hazard issues associated with the gas station, and found that, although the gas station would create a potential for fire, explosion, or the release of hazardous materials into the environment, the detailed regulatory requirements pertaining to the project would reduce such threats to a minimum. The 1999 EIR additionally stated that the proposed facility would be typical of urban development

[25] CO2e refers to equivalent carbon dioxide emissions that account for the emissions of other GHGs besides carbon dioxide and considers their potential global warming effect in terms of carbon dioxide.

operating safely throughout the United States and would not pose an undue threat to public health and safety.

The 2015 Project would expand the existing gas station, adding four new MPDs, as well as two new USTs—one 20,000-gallon diesel product UST and one 3,500-gallon gasoline/diesel split additive UST—and associated product piping. The USTs proposed as part of the 2015 Project are installed, maintained and regulated in the same manner.[26] These USTs would be subject to detailed regulatory requirements similarly to the Approved Project. Federal regulations under the Resource Conservation and Recovery Act of 1976 (RCRA) govern the installation and operation of USTs of at least 110 gallons which are used to store gasoline or other petroleum products. The USTs proposed by the 2015 Project would therefore be required to comply with RCRA, as well as any applicable State regulations (which largely mirror federal regulations).

The State's Unified Hazardous Waste and Hazardous Materials Management Regulatory Program (Unified Program) (SB 1082, Calderon), developed Certified Unified Program Agencies (CUPAs) to act as local programs responsible for permitting underground storage tanks. The Contra Costa CUPA would be responsible for permitting the two underground storage tanks proposed as part of the 2015 Project. Compliance with this permitting process would ensure that the 2015 Project would not increase the severity of any impacts identified in the 1999 EIR. Additionally, as no new information of substantial importance relating to hazards has emerged, and as no other circumstances surrounding the project have changed, no new or more severe impacts relating to hazards would result from the 2015 Project.

No new or substantially more severe significant hazards and hazardous materials effects would occur and no additional mitigation measures are required.

I. HYDROLOGY AND WATER QUALITY

The 1999 EIR analyzed effects to hydrology and water quality associated with implementation of the Approved Project and determined that the Approved Project would have five significant effects on hydrology and water quality that would all be reduced to less-than-significant levels with mitigation. The impacts were related to stormwater runoff, preventing future construction of a drainage outlet identified in the City's Master Drainage

[26] Cyr, Matt, Project Planner, Barghausen Consulting Engineers, Inc., on behalf of Costco Wholesale, 2015. Personal communication with Urban Planning Partners, May 19.

Plan, construction of a new drainage connection, soil erosion during construction, and expected decline in the quality of stormwater runoff from the developed site.

To address these impacts, the drainage plan for the Approved Project was refined to implement the recommended mitigation measures to ensure no increase in rate or total volume of runoff and that adequate infrastructure would be constructed. Additionally, a SWPPP was required to address construction-period soil erosion impacts. The impact on stormwater runoff quality was addressed by Mitigations 4.2-5A and 4.2-5B, as well as the installation of an oil/water separator at the gas station facility storm drain inlets and fossil filters for other inlets. Mitigations 4.2-5A and 4.2-5B required that the project sponsor prepare a plan for regular maintenance and long-term implementation of its Clean Water Program responsibilities, and that the drainage system and site plan be configured to provide infiltration areas throughout the project to capture the "first flush" of stormwater runoff. The measures and project revisions mentioned above reduced all significant impacts on hydrology and water quality identified for the Approved Project to a less-than-significant level.

As discussed in *Section III.B, Biology* of this Addendum, grading for the 2015 Project would be minimal, modifying only one percent of the 2015 Project site. Approximately 995 cubic yards of dirt would be moved, and cuts and fills would range from 0 feet to a maximum of 18 feet deep. Portions of the existing concrete pavement would be demolished near the existing fueling islands and near the northern corner of the site (where the USTs would be installed), and new concrete pavement would be added beneath the canopy addition. Additionally, a new concrete swale would be constructed around two sides of the four-sided fueling area to provide under canopy drainage.

The 2015 Project would add additional drainage features through landscaping, as required under the San Francisco Bay Region Municipal Regional Stormwater National Pollutant Discharge Elimination System (NPDES) Permit, discussed below. Approximately 800 square feet of additional landscaping is proposed, which includes a water quality bio-retention area that will treat runoff for over 10,000 square feet of impervious surface. Five existing parking stalls[27] on the western portion of the gas station would be removed and

[27] The 1999 EIR noted that the City of Concord parking ordinance requirement for this type of development was approximately 878 parking spaces, based on a ratio of 4.5 spaces per 1,000 square feet for the Costco store and 2.5 spaces per 1,000 square feet for the residual parking. The 1999 Project was therefore required to supply 878 parking spaces. The 2001 Approved Island did not eliminate any parking spaces from the total parking supply count. With the addition of the Approved Lot in 2001, the total parking space supply for the Approved Project increased to 944 parking spaces. At the time of preparation of this Addendum, the City of

replaced with this bio-retention area/Low Impact Development (LID) feature, which would be landscaped with a mix of trees, shrubs and groundcover. Three new trees would be planted as part of the 2015 Project and none would be removed.

Overall, there will be a net decrease of less than 0.5 percent of impervious coverage as a result of the proposed improvements. Storm drainage for the project area would be collected in a series of on-site pipes and catch basins prior to discharge to the public storm drainage system, as it is under existing conditions. The canopy roof drain runoff would be principally directed to the existing, on-site storm drainage system. The under canopy area is hydraulically isolated, and existing under canopy storm drainage would be directed to the existing oil/water separator before discharge to the public storm drainage system. Those existing water quality improvements would substantially limit the chance that any metal or chemical, including oil or grease, could enter the storm drain, parking lot, street, or waterway . It is, in fact, likely that the 2015 Project would have a beneficial impact on the water quality of the storm drainage discharge from the project site, given the bio-retention area LID feature is proposed to treat previously untreated impervious areas.

Additionally, as discussed in *Section III.B, Biology* of this Addendum, the 2015 Project would be required to prepare a SWPPP that would regulate runoff during construction and include Best Management Practices (BMPs) for erosion and sediment control, site management/housekeeping/ waste management, management of non-stormwater discharges, runon and runoff controls, and BMP inspection/maintenance/repair activities. The 2015 Project would also be required to comply with San Francisco Bay Region Municipal Regional Stormwater NPDES Permit, Order No. R2-2009-0074, NPDES Permit No. CAS612008, adopted October 14, 2009 (MRP), overseen by the San Francisco Bay Regional Water Quality Control Board, and any permit updates or successors thereto. MRP Provision C.3 addresses post-construction stormwater management requirements for new development or redevelopment projects at gas stations, a “Special Land Use Category,” that add and/or replace 5,000 square feet or more of impervious area. Provision C.3 requires Regulated Projects to incorporate post-construction stormwater management measures, including site design measures, source control measures, and stormwater treatment measures to reduce stormwater pollution after construction of the project.

Cocord code requires 4 parking spaces per 1,000 square feet, which calculates to 641.47 spaces for the 160,368 square-foot Costco warehouse building. With the loss of five parking stalls for the bio-retention area, the total parking supply for the project would be 939 parking spaces, which exceeds the current minimum required stall count of 642 by 297 parking stalls.

These requirements are in addition to standard stormwater-related best management practices (BMPs) required during construction, such as sedimentation and erosion control measures. The proposed features of the 2015 Project, specifically the addition of the bio-retention area LID feature, comply with and meet the requirements of Provision C.3.

The significant impacts identified in the 1999 EIR for the Approved Project were eliminated or mitigated to a less-than-significant level. The 2015 Project does not propose and changes to the existing drainage system—rather, it would add features that would improve water quality and drainage. Consequently, the 2015 Project would not increase the severity of any previously identified impacts, nor would it create any new significant impacts. Additionally, as the site location and drainage pattern have not changed since the 1999 EIR, the 2015 Project would have no impacts related to hydrology and water quality that are based on changes to the circumstances under which the project is undertaken or based on new information. As a result, no additional mitigation measures related to hydrology and water quality are required for the 2015 Project.

No new or substantially more severe significant hydrology and water quality effects would occur and no additional mitigation measures are required.

J. LAND USE AND PLANNING

The 1999 EIR analyzed effects of land use and planning policy associated with implementation of the Approved Project and determined that the Approved Project would result in three significant impacts related to land use incompatibility, which were determined per the City's Statement of Findings to be reduced to less-than-significant levels through the required mitigation measures. Specifically, the 1999 EIR found that the Approved Project would be out of scale with the adjoining properties and many of the buildings in the project vicinity, that the parking lot lights and gas station canopy lights would create glare impacts for neighboring residents of the Sierra Gardens condominium development, and that construction-related impacts would occur without implementation of mitigation measures.

The City's Statement of Findings found that the proposed mitigation measures were sufficient to reduce each impact to a less-than-significant level. Mitigations 4.1-1A and 4.1-1B required revisions to the Approved Project such as additional trellises and other landscaping and architectural details along the most visible elevations of buildings in order to reduce the significant impact related to building scale to a less-than-significant level. The glare impact of the parking lot lights and service station canopy lights on neighboring residents was reduced to a less-than-significant level through a project revision that relocated the gas station away from the Sierra Gardens condominium development. Additionally, Mitigation 4.1-2 required that the wattage of the parking lot lights be reduced and shorter light poles be installed. The third impact identified that

construction-related impacts would occur without implementation of mitigation measures. Mitigations 4.1-3A and 4.1-3B were required as conditions of project approval and outlined particular actions to control fugitive dust during construction. Mitigation 4.1-3C, an additional condition of project approval, required the implementation of a noise attenuation plan. These mitigation measures ensured that land use compatibility impacts were mitigated to a less-than-significant level.

Aside from the build out of the other components of the Approved Project (i.e., the Costco store, parking lot, etc.), the circumstances under which the project would be undertaken have not changed. The land uses surrounding the site are generally consistent with those analyzed in the 1999 EIR (the site is surrounded largely by commercial and retail uses, and no new residential developments have been constructed in the vicinity since the 1999 EIR). No new information of substantial importance exists that would affect the validity of the 1999 EIR analysis for the 2015 Project. As a result, the 2015 Project would not result in any new or substantially more severe impacts related to land use planning and no new or different mitigation measures are necessary.

The 2015 Project remains consistent with all applicable land use plans, policies, and regulations of agencies with jurisdiction over the project adopted for the purpose of avoiding or mitigating an environmental effect which were analyzed in the 1999 EIR. The project does not conflict with any plans or policies adopted since then, including the Concord 2030 General Plan (adopted in 2007 with subsequent amendments, including a Complete Streets amendment), and the adopted Climate Action Plan, as discussed in *Section III.G, Greenhouse Gas Emissions*. The 2015 Project is consistent with the 2030 General Plan standards outlined for the Regional Commercial (RC) land use designation.[28] The 2015 Project is also consistent with the applicable zoning district for the site: the fueling facility is an allowed use in the Regional Commercial (RC) District subject to a Use Permit approval. The RC District is consistent with and implements the regional commercial (RC) land use designation of the General Plan, ensuring consistency between the definitions and requirements of the RC zoning district and land use designation.[29] The 2015 Project is an expansion of an existing use (the Approved Project) that was approved in 1999 and through subsequent use permits, and constructed shortly thereafter. The project complies with applicable provisions of the Concord Development Code and Concord Municipal Code, including Section 18.200.090, which specifically applies to gas

[28] City of Concord, 2007. Concord 2030 General Plan. Volume I, p. 3-15. October 2.
[29] City of Concord, 2015. Municipal Code, *Section 18.40.010.E*.

stations. This section includes specific setbacks for pump islands, minimum lot sizes, and equipment screening standards. The 2015 Project is compatible with these standards.

2015 ProjectThe Land Use chapter of the General Plan identifies encouragement and support of regional commercial centers as a focus for the City. The following principle and policies highlight this point:

- Principle LU-3.1: Foster Strong Region-Serving Commercial Centers.
- Policy LU-3.1.2: Maintain and enhance existing region-serving centers so that they are competitive and offer a wide spectrum of retail products.
- Policy LU-3.1.3: Encourage existing region-serving centers to expand or adapt to market changes through reuse, rehabilitation, and infill development.

The 2015 Project is the expansion of an established use within an established commercial center that has serviced the region for over a decade. The 2015 Project is consistent with these land use policies because it is an improvement that responds to membership demands and keeps the regional Costco competitive. The project is scaled to effectively and efficiently service current and anticipated future demands for the site and anticipates providing reduced queuing wait times and reduced queuing congestion during peak service hours.

With regard to the air quality section of the Safety and Noise chapter of the General Plan, the City has adopted the following:

- Goal S-1: Air quality that meets State and Federal standards.
- Policy S-1.1.4: Require developers on a case-by-case basis to comply with the Bay Area Air Quality Management District regulations in effect at the time of project approval, including regulations relating to dust, toxic air contaminants {TAGs), odors, and other air pollutants or air quality issues.
- Policy S-1.1.5: Coordinate with the Bay Area Air Quality Management District (BAAQMD) when addressing air quality issues related to local land use proposals.

The 2015 Project utilizes the latest equipment and technology, along with operating procedures that meet or exceed federal and Bay Area Air Quality Management District (BAAQMD) regulations, and thus addresses this goal and associated policies. The 2015 Project would be regulated by the existing, maximum BAAQMD-permitted gasoline throughput limit approved for the site, and all BAAQMD permits required for the project will be obtained prior to construction. BAAQMD throughput limits apply only to gasoline. BAAQMD does not require a permit for the diesel tank storage or dispensing, and therefore does not regulate or condition the throughput amount. BAAQMD requirements and thresholds as they apply to the 2015 Project are discussed in further detail in *Section III.C, Air Quality.*

Finally, the General Plan indicates support for the project in the Economic Vitality chapter with the following policy:

- Policy E-2.1.2: Retain and attract business and facilitate businesses' efforts to develop and expand.

The expansion will allow Costco to provide a more efficient fuel purchasing experience for the members already utilizing the fueling facility. Costco's continued investment in the site demonstrates their commitment to the community and according to the above economic policy should be supported by the City.

The significant impacts identified in the 1999 EIR for the Approved Project were mitigated to a less-than-significant level. Because the 2015 Project proposes to expand upon the existing approved use of the site, the 2014 Project would not increase the severity of any previously identified impacts, or create any new significant impacts. Additionally, because the surrounding land uses have not changed since the 1999 EIR, the 2015 Project would have no impacts related to land use policy that are based on changes to the circumstances under which the project is undertaken or based on new information. As a result, no impacts exist for and no additional mitigation measures related to land use are required for the 2015 Project.

No new or substantially more severe significant land use and planning effects would occur and no additional mitigation measures are required.

K. MINERAL RESOURCES

The Initial Study prepared for the Approved Project concluded that there would be no impacts to mineral resources. As a result, the topic was not studied further in the 1999 EIR and required no related mitigation measures were required.

The site of the 2015 Project is part of the larger Approved Project site. The Approved Project has been constructed and is currently in operation. No other circumstances under which the project would be undertaken have changed. The location of the 2015 Project is the same as that of the Approved Project, and the site has been further disturbed by development (build out of the Approved Project) since the 1999 EIR. The 2015 Project proposes the addition of new MPDs, USTs, a canopy addition, and updated landscaping, the implementation of which would modify approximately one percent of the site by grading. Existing asphalt and concrete surfaces would be modified, and cuts and fills on site would range from approximately 0 to 18 feet in depth to accommodate construction and installation of the project components. These cuts and fills do not correspond to site grading but rather installation of the three USTs. The 2015 Project does not propose deep excavation or grading of a non-urbanized site, or any other intensive movement of

undisturbed land that could potentially contain mineral resources such as metals, industrial minerals (e.g., aggregate, sand and gravel), oil and gas, or geothermal resources that would be of value to the region and residents of the State. The 2015 Project therefore would not result in any new or more severe impacts than identified in the 1999 EIR. Furthermore, no new information related to mineral resources and applicable to the site has arisen since the 1999 EIR. As a result, the 2015 Project–similarly to the Approved Project—would have no impacts on mineral resources.

No new or substantially more severe significant mineral resources effects would occur and no additional mitigation measures are required.

L. NOISE

The 1999 EIR analyzed the potential noise impacts attributable to the construction and operation of the 1999 Project. The Approved Island and Approved Lot were approved and constructed subsequent to the completion of the 1999 Project and were exempt from CEQA review. The City of Concord General Plan has been updated since 1999. With regard to significance thresholds identified for operational noise, the Concord 2030 General Plan identifies a noise level increase of 4 dBA Ldn or more to be "significant" (Policy S-2.1.3). The 1999 EIR utilized a slightly more conservative threshold of 3 dBA Ldn as the significance threshold for evaluating substantial permanent increases to noise levels. Neither the Concord 2030 General Plan nor the City of Concord Municipal Code establishes noise level limits for stationary noise sources. Therefore, the significance criteria used in the 1999 EIR are conservative in terms of regulating noise exposure in the community and continue to be appropriate for this analysis of the proposed expansion of the fueling facility.

Temporary Construction Noise

The 1999 EIR identified a potentially significant noise impact due to construction of the entire Approved Project, and identified the need for mitigation to reduce the potentially significant construction noise impacts to a less-than-significant level. Mitigation Measure 4.7-5 of the 1999 EIR requires that the project sponsor shall prepare and implement a noise attenuation plan that will include the following measures:

- Limit construction activity between the hours of 7:00 a.m. and 6:00 p.m. with no construction activity on Sundays or holidays without prior written approval by the Chief of Planning.
- Maintain and muffle all construction equipment powered by internal combustion engines.
- Identify construction equipment staging areas that are 200 feet from residential units.

Construction activities associated with the proposed project are considered to be fairly minor compared to the 1999 Project; therefore the implementation of Mitigation Measure 4.7-5, as specified in the 1999 EIR, would be expected to result in a less-than-significant temporary construction noise impact at sensitive receptors in the project vicinity.

Permanent Project Operational Noise

The 1999 EIR also analyzed the potential permanent noise impacts attributable to the operation of the Approved Project. Noise sources expected as a result of the proposed expansion of the fueling facility would be similar to those analyzed as part of the 1999 Project. The analysis completed as part of the 1999 EIR determined that, with the exception of parking lot maintenance equipment and mechanical equipment on the nearest buildings of the residual property, all other stationary noise sources, including the gas station component of the 1999 Project, would generate noise levels that would conform to the City of Concord noise level limits. Operational noise levels would not significantly increase existing ambient noise levels at noise-sensitive land uses as the distances to the nearest noise-sensitive residential receptors are sufficient to reduce noise levels produced by these sources to levels that would not be substantially increased over existing conditions. Noise produced by these stationary noise sources may at times be audible, but the majority of activity will be below ambient noise levels resulting from traffic along roadways serving the site. The 1999 EIR also determined that project-generated traffic would not significantly affect adjacent residential, commercial, and industrial land uses.

The proposed expansion of the fueling facility includes one (1) additional MPD on the entry side of all four (4) existing fuel islands, yielding eight (8) additional fueling positions. Operational noise levels attributable to use of these new fueling positions would be expected to be similar to existing operations, and consistent with the 1999 EIR. Noise produced by use of these new fueling positions may at times be audible, but the majority of activity will be below ambient noise levels attributable to Monument Boulevard traffic to the nearest receptors within the Vista Del Monte RV Park, located approximately 250 feet from the project on the north side of Monument Boulevard. Permanent noise increases resulting from the Approved Project and 2015 Project would continue to be less than 3 dBA Ldn, which is below the 1999 EIR significance criteria and the standards contained in the Concord 2030 General Plan. Operational noise levels would also conform

to the City of Concord noise level limits established in the 1999 EIR and Concord 2030 General Plan.

A review of the Concord Costco Gasoline Fuel Station Expansion Vehicle Trip Generation and Queuing Summary[30] indicates that total weekday and weekend daily vehicle trips would increase by approximately 9 percent with the proposed fueling expansion project. An increase in traffic trips of approximately 26 percent would be required for the project to result in a noise level increase of 1 dBA. A 100 percent increase in traffic trips would be required for the project to result in a noise level increase of 3 dBA. Therefore, project-generated traffic noise will continue to be less than 3 dBA Ldn, which is below the 1999 EIR significance criteria and the standards contained in the Concord 2030 General Plan. Further, the additional project trips are only a small fraction of the daily trips that currently occur along Monument Boulevard. As a result, project-generated traffic would not substantially increase ambient noise levels at nearby noise-sensitive receptors, and the 2015 Project would not create any new or more severe impacts.

M. POPULATION AND HOUSING

The Initial Study prepared for the Approved Project concluded that there would be no impacts to population and housing. As a result, the topic was not studied further in the 1999 EIR and no related mitigation measures were required. The circumstances under which the 2015 Project is being undertaken related to population and housing have not changed from the circumstances under which the Approved Project was undertaken and evaluated in the 1999 EIR. The 2015 Project would expand the existing gas station and would not include any type of residential component, nor affect any existing residential development such that it would displace substantial numbers of existing housing or persons. Additionally, because the 2015 Project is an expansion of an existing business (the addition of 8 fuel product dispensers and 2 USTs to an existing gas station), its effect on inducing growth would be similar to the Approved Project (which had no impact). Employee staffing levels (one attendant per shift) would remain unchanged. As a result, the 2015 Project would not create any new or more severe impacts.

No new or substantially more severe significant population and housing effects would occur and no additional mitigation measures are required.

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[30] Kittelson & Associates, Inc., 2015. Memo to Urban Planning Partners: Concord Costco Gasoline Fuel Station Expansion Vehicle Trip Generation and Queuing Summary. January 20.

N. PUBLIC SERVICES

The Initial Study prepared for the Approved Project determined that no impacts to public services would result from the Approved Project. As a result, the topic was not studied further in the 1999 EIR and no related mitigation measures were required.

The 2015 Project is an expansion of the existing gas station component of the Approved Project that was built shortly after its approval in 1999. The 2015 Project would add 4 additional MPDs which would supply a total of 8 new fueling positions for the gas station. The 2015 Project is not anticipated to generate a significant number of new trips to the fueling facility. Instead, the expansion is expected to provide a more efficient fuel purchasing experience for the members who are already utilizing the fueling facility by reducing wait times, vehicle queuing, and vehicle idling. The existing hours of operation (5:00 a.m. to 10:00 p.m.) and employee staffing levels (one attendant per shift) would remain unchanged.

Similar to the Approved Project, the site plan and UST plan for the 2015 Project would be reviewed by the Contra Costa County Fire Protection District to ensure that the appropriate requirements are met, including that the appropriate number of fire hydrants and amount of fire suppression equipment (sprinklers) would be provided throughout the facility and that the gas pumps would be equipped with emergency shutoff valves, amongst other requirements. Security protection measures currently in place for the Approved Project are sufficient for the 2015 Project, as the 2015 Project would not be expanding the overall area of the existing gas station. Moreover, the 2015 Project would not add new employees or residents, no impact to school services or parks would result from the 2015 Project. The maintenance of existing streets in the vicinity of the project would not be expected to increase from the 2015 Project, as the expansion is not expected to generate a significant number of new vehicle trips to the gas station.

The 2015 Project site is encompassed by the Approved Project site, no changes to the circumstances under which the project would be undertaken have occurred, and no new information exists that is applicable to the provision of public services at the 2015 Project site. Given these facts, and those discussed above, the 2015 Project would have no impact on the provision of public services.

No new or substantially more severe significant public services effects would occur and no additional mitigation measures are required.

O. RECREATION

The Initial Study prepared for the Approved Project concluded that there would be no impacts to recreation or parks associated with implementation of the Approved Project. As

a result, the topic was not studied further in the 1999 EIR and no related mitigation measures were required.

The 2015 Project is an expansion of the existing Costco gas station on the Approved Project site that would add 4 additional MPDs, which would supply a total of 8 new fueling positions for the gas station, as well as two new USTs, a canopy addition, and new landscaping features. The 2015 Project is not anticipated to generate a significant number of new trips to the fueling facility. Instead, the expansion is expected to provide a more efficient fuel purchasing experience for the members who are already utilizing the fueling facility by reducing wait times, vehicle queuing, and vehicle idling. The existing hours of operation (5:00 a.m. to 10:00 p.m.) and employee staffing levels (one attendant per shift) would remain unchanged.

The 2015 Project would not require any new employees or residents. As a result, the 2015 Project would have no impact on existing neighborhood and regional parks or other recreational facilities. Additionally, the 2015 Project site is encompassed by the Approved Project site, no changes to the circumstances under which the project would be undertaken have occurred, and no new applicable information exists. Given these facts, the 2015 Project would have no impact on parks or recreational facilities.

No new or substantially more severe significant recreation effects would occur and no additional mitigation measures are required.

P. TRANSPORTATION/TRAFFIC

The transportation impact analysis prepared for the 2015 Project and included as *Appendix C* examines the current transportation network and addresses the environmental effects on future circulation system that would result from the implementation of the 2015 Project.

Intersection Level of Service

Seven study intersections (including site driveways) were selected and agreed upon by the City of Concord for inclusion in the traffic operations analysis. The results of the existing conditions show all study intersections operate at acceptable levels of service during the weekday PM (5:00 p.m. to 6:00 p.m.) and weekend midday (1:05 p.m. to 2:05 p.m.) peak hours.

The 2015 Project would include eight new fueling positions, increasing capacity 50 percent from 16 fueling positions to 24 fueling positions, estimated to generate 220 daily net new trips during the weekday and 255 daily net new trips during the weekend. Of the 220 net new daily trips during the weekday, it is estimated that 20 net new trips (10

inbound, 10 outbound) are projected to occur during the weekday PM peak hour. Of the 255 net new daily trips during the weekend, it is estimated that 25 net trips (15 inbound, 10 outbound) are projected to occur during the weekend midday peak hour.

The existing plus project conditions include project-generated trips from the proposed Concord Costco gasoline fuel station expansion. Traffic operation results indicate that all study intersections are forecast to operate with acceptable levels of service during the weekday PM and weekend midday peak hours.

Cumulative traffic conditions at the study intersections were based on a 0.9-percent annual growth rate applied to the existing traffic volumes in Year 2040. There were two intersections operating below the City of Concord's level of service standards in the cumulative conditions.

- Intersection 2 – Monument Boulevard/Costco Driveway
  - Operates at LOS "E" with an average delay of 47.2 seconds per vehicle and a vehicle-to-capacity ratio of 0.83 during the weekend midday peak hour.
- Intersection 3 – Monument Boulevard/Detroit Avenue
  - Operates at LOS "E" with an average delay of 62.0 seconds per vehicle and a vehicle-to-capacity ratio of 0.87 during the weekday PM peak hour.
  - Operates at LOS "F" with an average delay of 81.4 seconds per vehicle and a vehicle-to-capacity ratio of 0.97 during the weekend midday peak hour.

Cumulative plus project conditions include project-generated traffic from the proposed Concord Costco gasoline fuel station expansion. Project-generated traffic from the 2015 Project would be considered a significant impact at an intersection operating below City standard's if average delay increases by three seconds or more. Likewise if any of the intersections operating at acceptable level of service drop below LOS "D", the Project would be considered a significant impact at that location. The transportation impact analysis for this project shows that study intersections are forecast to operate LOS D or better and project trips do not increase delay by more than three seconds at intersections operating below the City's level of service standards. Therefore, project-generated trips due to the 2015 Project would not significantly impact any of the study intersections in either the weekday PM or weekend midday peak hours.

Intersection Queuing

In addition to the traffic operations analysis, the City of Concord requested an intersection queuing analysis at each of the study intersections. The analysis looked at the impact of

the project-generated trips on 95th percentile queue lengths, which represent queue lengths not expected to be exceeded during 95 percent of the peak hour. Using Trafficware's Synchro 8 program, the queue analysis analyzed 95th percentile queues at each of the study intersections, including site driveways during existing and existing plus project, as well as cumulative and cumulative plus project scenarios. Results from Synchro 8 for the weekday PM and weekend midday peak hours were verified by field observations when vehicle turning movement counts were collected in November 2014.

There are two intersections that have vehicular movements exceeding their storage length during the existing weekday PM and weekend midday peak hours. The signalized intersection of Monument Boulevard/Detroit Avenue has 95th percentile queues exceeding queue storage for the eastbound left and northbound left movements. The signalized intersection of Monument Boulevard/Cowell Road has 95th percentile queues exceeding storage lengths in the eastbound right, northbound left, and southbound left movements during the weekday PM peak hour and the northbound left and southbound left movements during the weekend midday peak hour.

The existing plus project scenario (which includes project-generated trips) does not impact or increase any of the queues at the study intersections. A detailed summary of the queuing analysis is presented in Tables 10 and 11 of *Appendix C*, which show queues lengths at study intersections stay the same with project-generated trips. This includes queues already exceeding storage length at the Monument Boulevard/Detroit Avenue and Monument Boulevard/Cowell Road intersections.

Similar to the existing scenarios, the intersection of Monument Boulevard/Detroit Avenue and Monument Boulevard/Cowell Road reported 95th percentile queues exceeding storage length in the cumulative scenario during the weekday PM peak hour. In addition, the signalized intersections of Monument Boulevard/Oak Grove Road experienced movements with 95th percentile queue lengths exceeding the available storage capacity in cumulative scenario during the weekend midday peak hour. Queue lengths did not increase or were not significantly impacted because of the project-generated trips in the cumulative plus project scenario. Tables 12 and 13 of *Appendix C* show queue lengths stay the same between both cumulative and cumulative plus project scenarios.

Parking

The analysis evaluated the current and projected future parking conditions at the Costco site as they related to the 2015 Project. Existing parking conditions at the Concord Costco site (including relevant adjacent parcels) were inventoried and observed during the weekday PM and weekend midday peak demand periods to identify the existing parking supply and demand. This evaluation included a review of existing parking inventories, peak hour occupancy, parking conditions, and the physical layout of existing parking

facilities. The focus of the parking analysis was to inventory parking on the site, including the number of parking spaces available and to obtain peak period parking occupancy counts to determine the current utilization of parking supply.

The existing parking inventory and demand within the study area was designated by parking zones as illustrated in Figure 16 in *Appendix C*. There are a total of 944 existing parking spaces. The certified 1999 EIR identified 838 on-site parking spaces as required. Since the previously approved EIR, fuel station and warehouse expansions have reduced the number of on-site parking spaces provided to 782. However, while the on-site parking spaces have been reduced, the total Costco parking supply has increased as a result of the Approved Lot in Zone 1. Zone 1 is an employee/overflow parking area consisting of 162 spaces and is located east of the warehouse, across the street on Detroit Avenue. This parking lot is leased to Costco and is designated for employee/overflow parking. From the parking data collected, it was determined that the peak half-hour of parking demand during occurred during the weekend midday peak period from 1:00 to 1:30 p.m. when 94 percent of total parking spaces on site were occupied. The peak half-hour for parking demand coincides with the midday peak hour, occurring from 1:05 p.m. to 2:05 p.m. During the three hour weekend midday peak period, the site was 89 percent occupied.

The site plan for the 2015 Project displays a net decrease of five parking spaces. These five parking spaces would be removed from Zone 4 and replaced with a water quality feature. Zone 4 had a utilization rate of 95 percent during the weekend peak half hour. The 2015 Project would lower Zone 4 parking supply from 80 to 75 spaces.

While some parking spaces would be removed in Zone 4, it is a minimal five spaces and the parking currently using those stalls can be accommodated by parking available in underutilized parking zones closer to the Costco entrance or in other areas of the site. Given that parking demand under existing conditions is constrained during the weekend midday peak period and only a minimal amount of spaces would be reduced (5 spaces out of a total of 944, including off-site employee parking), it can be concluded that there would still be sufficient parking on site to accommodate the proposed fuel station expansion. It is not anticipated that the 2015 Project would significantly increase or noticeably change parking demand on the site. However, even if parking demand does increase, there is still 6 percent reserve capacity during the weekend peak half-hour (or approximately 57 spaces) to accommodate a fluctuation in parking demand.

Site Access

The Concord Costco site has three site access points. One full access exists on Detroit Avenue and two stop-controlled accesses, one with access to eastbound Monument Boulevard and to the south of the site with access to the Southern Access Road and

Detroit Avenue. The fuel station can be accessed by any of the site driveways; however, the full movement access on Detroit Avenue is closest to the gasoline station entrance.

Gasoline fuel tanker trucks would access the gasoline station through the full access intersection on Detroit Avenue. Gasoline trucks truck turning movements are accommodated throughout the fuel station area and surrounding parking zones. After refilling the Costco Gasoline tanks, trucks would exit the site at the full access at Detroit Avenue. It is also important to note that the fuel truck delivery can occur without disruption to the on-going operations of the fuel station. The fuel station can remain operational during fuel delivery and the fuel delivery area has been designed to occur at the far north end of the fuel station area out of the way of the fuel dispensers and queuing area behind the dispensers.

On-site Queuing and Circulation

Queuing and operations at the existing Concord Costco Gasoline fuel station were evaluated to establish a baseline for comparison with the implementation of the proposed 24-station fueling position station upon expansion. Maximum, minimum, average, and 95th percentile queues were identified for the peak hours observed.

Queue length totals include vehicles at the fueling positions which accommodate 16 vehicles under existing conditions. Queues at the fuel station were longer during the weekend midday peak period than during the weekday PM peak period. The average queue during the weekend midday peak hour was 8 vehicles longer than during the weekday PM peak hour. The maximum queue observed during any time period was 57 vehicles which occurred during the weekend midday peak hour.

Costco does not maintain or identify specific targets for the maximum length of queue they wish to maintain for members at their fuel stations. However, they do seek to maintain operations at a level where members' inconvenience and complaints are minimized and where queuing from the fuel station does not interfere with circulation and operations in the parking field or in other areas of the site.

The 2015 Project would increase capacity by 50 percent with the addition of the proposed eight fuel station pumps, raising its total from 16 fuel station pumps to 24. Existing 95th percentile queues during the weekend midday peak hour currently exceed queue storage for the gasoline fueling station. With the implementation of the proposed fuel station expansion, 95th percentile queues are estimated to decrease by approximately 35 percent and 13 percent during the weekday PM and weekend midday peak hours, respectively. The 95th percentile queue lengths are estimated to reduce from 51 to 33 vehicles during the weekday PM peak hour and from 53 to 46 vehicles during the weekend midday peak

hour. The addition of the eight fueling stations is estimated to reduce vehicle queues to within the designated queuing area during the weekend midday peak hour.

Overall, the results of the traffic impact analysis indicate that the 2015 Project could be constructed while maintaining acceptable levels of service and safety on the surrounding transportation system and within the Costco site. Given these findings, the 2015 Project would have no impact on parks or recreational facilities.

No new or substantially more severe significant recreation effects would occur and no additional mitigation measures are required.

Q. UTILITIES AND SERVICES SYSTEMS

The Initial Study prepared for the Approved Project identified no significant impacts related to utilities. The Initial Study for the Approved Project did identify impacts to stormwater drainage or stormwater quality control as potentially significant without mitigation incorporated. The 1999 EIR explored this issue in its *Drainage* section, and the City's Statement of Findings concluded that all identified impacts had been eliminated or reduced to a less-than-significant level through project revisions and/or mitigation measures. Similarly, because the 2015 Project is an expansion of an existing gas station facility that had no impacts on utilities, and would be required to comply with all City, regional, State, and federal regulations related to stormwater runoff management and quality, the 2015 Project would similarly result in no impacts on utilities. Analyses for both the Approved Project (from the 1999 EIR) and 2015 Project related to stormwater drainage or stormwater quality control are discussed in *Section III.I, Hydrology and Water Quality* of this Addendum.

The significant impacts identified in the 1999 EIR for the Approved Project were eliminated or mitigated to a less-than-significant level. The 2015 Project does not propose and changes to existing utilities services. Additionally, the site location, use, and utilities provisions have not changed since the 1999 EIR, the 2015 Project would have no impacts related to utilities that are based on changes to the circumstances under which the project is undertaken or based on new information. As such, the 2015 Project would not increase the severity of any previously identified impacts, nor would it create any new significant impacts2015 Project, and no additional mitigation measures related to utilities are required for the 2015 Project.

No new or substantially more severe significant utilities and services systems effects would occur and no additional mitigation measures are required.

R. MANDATORY FINDINGS OF SIGNIFICANCE

Chapter 5 of the 1999 EIR addressed mandatory findings of significance associated with the Approved Project. The 1999 EIR identified mitigation measures to reduce all potentially cumulative impacts related to drainage, traffic/circulation, biological resources, noise, and visual resources to a less-than-significant level, and resulted in no growth-inducing impacts. The 1999 EIR, however, identified one significant and unavoidable adverse impact to air quality: the Approved Project would contribute to an increase in regional emissions that could not be mitigated to an acceptable level. In response, the City certified the 1999 EIR on December 14, 1999, and adopted a Statement of Overriding Considerations. That Statement of Overriding Considerations remains valid and in effect. However, it is noted that emissions standards become more stringent since the 1999 EIR; so it is arguable that emissions have dropped over the years due to regulatory efforts, cleaner gas, car manufacture, etc.

The 2015 Project would expand the existing gas station component approved and constructed as part of the Approved Project, adding additional features within the footprint of the existing gas station. As a result, the 2015 Project would be subject to similar urbanized, environmental conditions as identified and analyzed in the 1999 EIR. No new resources would be impacted and no increase in effects would occur. No new or substantially more severe significant effects would occur and no new or different mitigation measures are required.

IV. CONCLUSION

On the basis of the evaluation presented in this Addendum, the changes associated with the 2015 Project would not trigger any of the conditions listed in Section I.D of this Addendum, requiring preparation of a subsequent or supplemental EIR or MND. Thus, this Addendum satisfies the requirements of CEQA Guidelines sections 15162 and 15164. The 2015 Project would not introduce new significant environmental effects, substantially increase the severity of previously identified significant environmental effects, or show that mitigation measures previously found not to be feasible would in fact be feasible.

Overall, the 2015 Project would result in less severe effects than those of the Approved Project due to the marginal expanse and intensity of construction and operation requirements compared to the Approved Project. The 2015 Project would therefore generate marginal to comparable effects. The 2015 Project would not result in new significant effects or effects that would be substantially more severe than those identified in the 1999 EIR. The mitigation measures included in the 1999 EIR that remain applicable are listed with page numbers in this Addendum for easy reference.

The analyses and conclusions in the 1999 EIR remain current and valid. The 2015 Project would not cause new or substantially more severe significant effects than identified in the 1999 EIR, and thus no new mitigation measures would be required. All mitigation measures will remain in place and continue to be enforced, and the Statement of Overriding Considerations remain in effect. No change has occurred with respect to circumstances surrounding the 2015 Project that would cause new or substantially more severe significant environmental effects than identified in the 1999 EIR or caused by the Approved Project, and no new information has become available that shows that the 2015 Project would cause significant environmental effects not already analyzed in the 1999 EIR. Therefore, no further environmental review is required beyond this Addendum.

None of the elements set forth in Public Resources Code Section 21166 or CEQA Guidelines Section 15162 exists, and in accordance with Public Resources Code Section 21166 and CEQA Guidelines Section 15162, no subsequent or supplemental EIR or MND is required. Thus, this Addendum satisfies the requirements of CEQA, including CEQA Guidelines sections 15162 and 15164.

V. REFERENCES

City of Concord, 2012. 2030 Urban Area General Plan. Amended July 10, 2012.

City of Concord, 1999. Costco Wholesale Development Environmental Impact Report.

City of Concord, 2011. Report to Zoning Administrator: Costco Wholesale Parking Lot Expansion – Zoning Administrator Permit (ZA 11-010) and Design Review (DR 11- 017). August 11.

City of Concord, 2011. ZA Order No. 11-008. July 13.

City of Concord, 1999. Costco Wholesale Project Use Permit (UP 26-99).

City of Concord, 2001. Costco Wholesale Project Use Permit Amendment (UPA 2-01).

City of Concord, 2015. Municipal Code, Chapter 18: Development Code, Section 18.200.090 and Section 18.40.010.E.

City of Concord, 2014. Environmental Impact Fact Sheet. September 25.

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Cyr, Matt, Project Planner, Barghausen Consulting Engineers, Inc., on behalf of Costco Wholesale, 2015. Personal communication with Urban Planning Partners, May 19.

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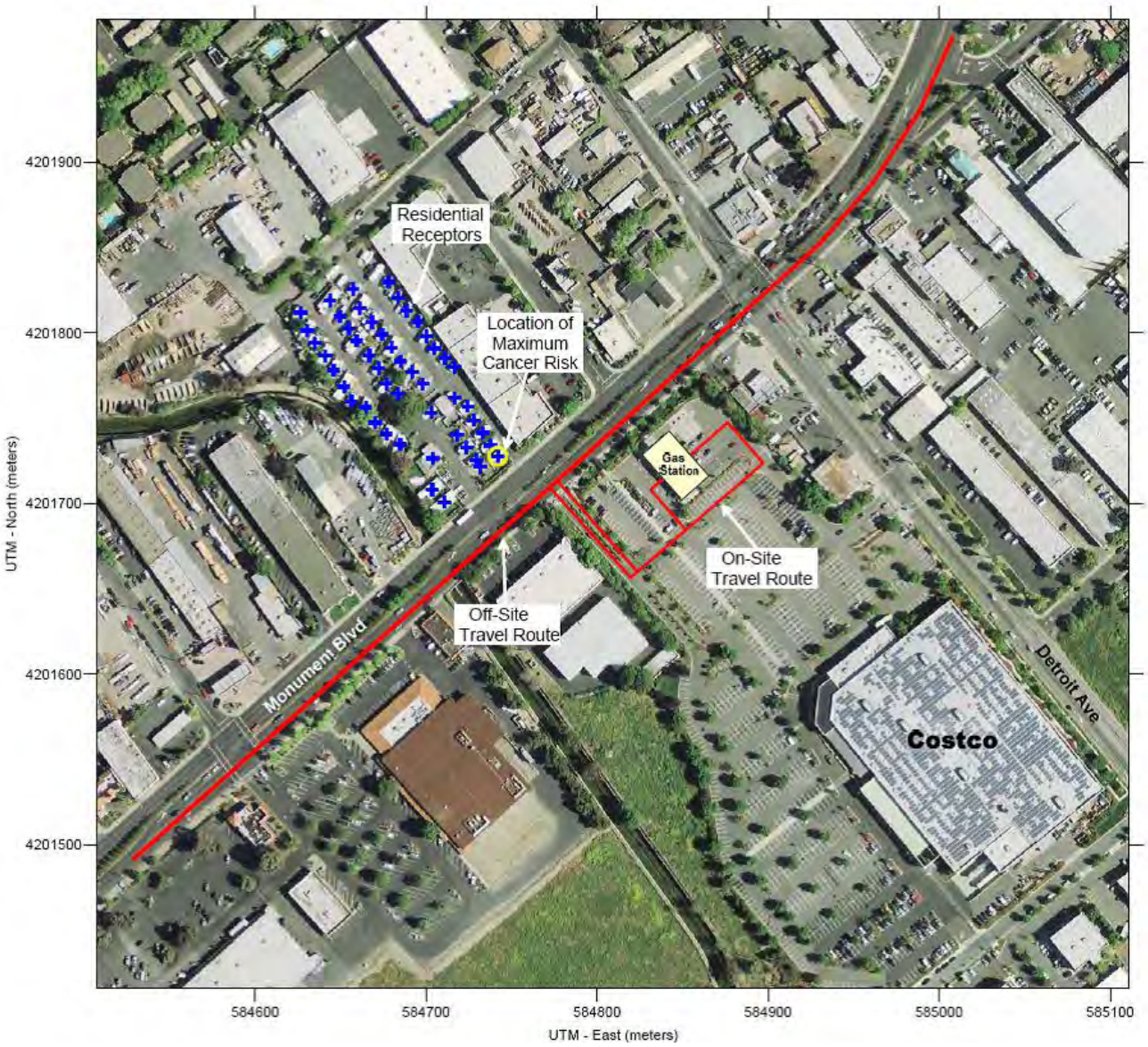

05.18.2015 P:\14-022 COST\PRODUCTS\Graphics

Source: Illingworth & Rodkin, 2015

Figure 1
Addendum to Costco Wholesale Development EIR
Sensitive Receptor Locations and Project Vehicle Travel Routes

APPENDIX A

CalEEMod Modeling Output

Costco Fueling Station - Existing 16 Pumps

Contra Costa County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Gasoline/Service Station	16.00	Pump	1.00	2,258.80	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	58
Climate Zone	4			**Operational Year**	2016
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	641.35	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Approximate acreage

Construction Phase - No Construction

Off-road Equipment - No Construction predicted

Vehicle Trips - Based on 4020 weekday and 3540 weekend trips (External)/16 pumps and 33% Passby

Table Name	Column Name	Default Value	New Value
tblArchitecturalCoating	EF_Nonresidential_Exterior	150.00	250.00
tblArchitecturalCoating	EF_Nonresidential_Interior	100.00	250.00
tblArchitecturalCoating	EF_Residential_Exterior	150.00	250.00
tblArchitecturalCoating	EF_Residential_Interior	100.00	250.00
tblConstructionPhase	NumDays	5.00	1.00
tblLandUse	LotAcreage	0.05	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblProjectCharacteristics	OperationalYear	2014	2016
tblVehicleTrips	DV_TP	27.00	0.00
tblVehicleTrips	PB_TP	59.00	33.00
tblVehicleTrips	PR_TP	14.00	67.00
tblVehicleTrips	ST_TR	162.78	221.25
tblVehicleTrips	SU_TR	162.78	221.25
tblVehicleTrips	WD_TR	162.78	251.00

2.0 Emissions Summary

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.0100	0.0000	1.5000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.9000e-004	2.9000e-004	0.0000	0.0000	3.0000e-004

Energy	3.3000e-004	3.0300e-003	2.5500e-003	2.0000e-005		2.3000e-004	2.3000e-004		2.3000e-004	2.3000e-004	0.0000	9.2377	9.2377	3.3000e-004	1.2000e-004	9.2806
Mobile	2.3631	4.4765	22.0777	0.0372	2.6035	0.0527	2.6562	0.6973	0.0484	0.7456	0.0000	2,948.1883	2,948.1883	0.1384	0.0000	2,951.0943
Waste						0.0000	0.0000		0.0000	0.0000	1.7498	0.0000	1.7498	0.1034	0.0000	3.9214
Water						0.0000	0.0000		0.0000	0.0000	0.0674	0.4671	0.5346	6.9500e-003	1.7000e-004	0.7325
Total	**2.3734**	**4.4796**	**22.0804**	**0.0372**	**2.6035**	**0.0529**	**2.6564**	**0.6973**	**0.0486**	**0.7459**	**1.8172**	**2,957.8934**	**2,959.7106**	**0.2491**	**2.9000e-004**	**2,965.0290**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.0100	0.0000	1.5000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.9000e-004	2.9000e-004	0.0000	0.0000	3.0000e-004
Energy	3.3000e-004	3.0300e-003	2.5500e-003	2.0000e-005		2.3000e-004	2.3000e-004		2.3000e-004	2.3000e-004	0.0000	9.2377	9.2377	3.3000e-004	1.2000e-004	9.2806
Mobile	2.3631	4.4765	22.0777	0.0372	2.6035	0.0527	2.6562	0.6973	0.0484	0.7456	0.0000	2,948.1883	2,948.1883	0.1384	0.0000	2,951.0943
Waste						0.0000	0.0000		0.0000	0.0000	1.7498	0.0000	1.7498	0.1034	0.0000	3.9214
Water						0.0000	0.0000		0.0000	0.0000	0.0674	0.4671	0.5346	6.9400e-003	1.7000e-004	0.7324
Total	**2.3734**	**4.4796**	**22.0804**	**0.0372**	**2.6035**	**0.0529**	**2.6564**	**0.6973**	**0.0486**	**0.7459**	**1.8172**	**2,957.8934**	**2,959.7106**	**0.2491**	**2.9000e-004**	**2,965.0289**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	2.3631	4.4765	22.0777	0.0372	2.6035	0.0527	2.6562	0.6973	0.0484	0.7456	0.0000	2,948.1883	2,948.1883	0.1384	0.0000	2,951.0943
Unmitigated	2.3631	4.4765	22.0777	0.0372	2.6035	0.0527	2.6562	0.6973	0.0484	0.7456	0.0000	2,948.1883	2,948.1883	0.1384	0.0000	2,951.0943

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Gasoline/Service Station	4,016.00	3,540.00	3540.00	6,995,899	6,995,899
Total	4,016.00	3,540.00	3,540.00	6,995,899	6,995,899

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by

Gasoline/Service Station	9.50	7.30	7.30	2.00	79.00	19.00	67	0	33

LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
0.527627	0.065080	0.176461	0.145848	0.036424	0.004888	0.009671	0.020781	0.001221	0.001487	0.006359	0.002101	0.002052

5.0 Energy Detail

4.4 Fleet Mix

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	5.9337	5.9337	2.7000e-004	6.0000e-005	5.9566
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	5.9337	5.9337	2.7000e-004	6.0000e-005	5.9566
NaturalGas Mitigated	3.3000e-004	3.0300e-003	2.5500e-003	2.0000e-005		2.3000e-004	2.3000e-004		2.3000e-004	2.3000e-004	0.0000	3.3040	3.3040	6.0000e-005	6.0000e-005	3.3241
NaturalGas Unmitigated	3.3000e-004	3.0300e-003	2.5500e-003	2.0000e-005		2.3000e-004	2.3000e-004		2.3000e-004	2.3000e-004	0.0000	3.3040	3.3040	6.0000e-005	6.0000e-005	3.3241

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Gasoline/Service Station	61913.7	3.3000e-004	3.0300e-003	2.5500e-003	2.0000e-005		2.3000e-004	2.3000e-004		2.3000e-004	2.3000e-004	0.0000	3.3040	3.3040	6.0000e-005	6.0000e-005	3.3241
Total		**3.3000e-004**	**3.0300e-003**	**2.5500e-003**	**2.0000e-005**		**2.3000e-004**	**2.3000e-004**		**2.3000e-004**	**2.3000e-004**	**0.0000**	**3.3040**	**3.3040**	**6.0000e-005**	**6.0000e-005**	**3.3241**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Gasoline/Service Station	61913.7	3.3000e-004	3.0300e-003	2.5500e-003	2.0000e-005		2.3000e-004	2.3000e-004		2.3000e-004	2.3000e-004	0.0000	3.3040	3.3040	6.0000e-005	6.0000e-005	3.3241
Total		**3.3000e-004**	**3.0300e-003**	**2.5500e-003**	**2.0000e-005**		**2.3000e-004**	**2.3000e-004**		**2.3000e-004**	**2.3000e-004**	**0.0000**	**3.3040**	**3.3040**	**6.0000e-005**	**6.0000e-005**	**3.3241**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Gasoline/Service Station	20397	5.9337	2.7000e-004	6.0000e-005	5.9566
Total		**5.9337**	**2.7000e-004**	**6.0000e-005**	**5.9566**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Gasoline/Service Station	20397	5.9337	2.7000e-004	6.0000e-005	5.9566
Total		**5.9337**	**2.7000e-004**	**6.0000e-005**	**5.9566**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0100	0.0000	1.5000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.9000e-004	2.9000e-004	0.0000	0.0000	3.0000e-004
Unmitigated	0.0100	0.0000	1.5000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.9000e-004	2.9000e-004	0.0000	0.0000	3.0000e-004

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	1.1800e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	8.8200e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	1.0000e-005	0.0000	1.5000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.9000e-004	2.9000e-004	0.0000	0.0000	3.0000e-004
Total	**0.0100**	**0.0000**	**1.5000e-004**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**2.9000e-004**	**2.9000e-004**	**0.0000**	**0.0000**	**3.0000e-004**

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	1.1800e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	8.8200e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	1.0000e-005	0.0000	1.5000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.9000e-004	2.9000e-004	0.0000	0.0000	3.0000e-004
Total	**0.0100**	**0.0000**	**1.5000e-004**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**2.9000e-004**	**2.9000e-004**	**0.0000**	**0.0000**	**3.0000e-004**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	0.5346	6.9400e-003	1.7000e-004	0.7324
Unmitigated	0.5346	6.9500e-003	1.7000e-004	0.7325

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Gasoline/Service Station	0.21251 / 0.130248	0.5346	6.9500e-003	1.7000e-004	0.7325
Total		**0.5346**	**6.9500e-003**	**1.7000e-004**	**0.7325**

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Gasoline/Service Station	0.21251 / 0.130248	0.5346	6.9400e-003	1.7000e-004	0.7324
Total		**0.5346**	**6.9400e-003**	**1.7000e-004**	**0.7324**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	1.7498	0.1034	0.0000	3.9214
Unmitigated	1.7498	0.1034	0.0000	3.9214

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Gasoline/Service Station	8.62	1.7498	0.1034	0.0000	3.9214
Total		**1.7498**	**0.1034**	**0.0000**	**3.9214**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Gasoline/Service Station	8.62	1.7498	0.1034	0.0000	3.9214
Total		**1.7498**	**0.1034**	**0.0000**	**3.9214**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Vegetation

Costco Fueling Station - Future Project 24 Pumps

Contra Costa County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Gasoline/Service Station	24.00	Pump	1.00	3,388.20	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	58
Climate Zone	4			**Operational Year**	2016
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	641.35	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Approximate acreage

Construction Phase - No Construction

Off-road Equipment - No Construction predicted

Vehicle Trips - Based on 4390 weekday and 3870 weekend trips (External)/16 pumps and 33% Passby

Table Name	Column Name	Default Value	New Value
tblArchitecturalCoating	EF_Nonresidential_Exterior	150.00	250.00
tblArchitecturalCoating	EF_Nonresidential_Interior	100.00	250.00
tblArchitecturalCoating	EF_Residential_Exterior	150.00	250.00
tblArchitecturalCoating	EF_Residential_Interior	100.00	250.00
tblConstructionPhase	NumDays	5.00	1.00
tblLandUse	LotAcreage	0.08	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblProjectCharacteristics	OperationalYear	2014	2016
tblVehicleTrips	DV_TP	27.00	0.00
tblVehicleTrips	PB_TP	59.00	33.00
tblVehicleTrips	PR_TP	14.00	67.00
tblVehicleTrips	ST_TR	162.78	161.25
tblVehicleTrips	SU_TR	162.78	161.25
tblVehicleTrips	WD_TR	162.78	182.92

2.0 Emissions Summary

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.0150	0.0000	2.3000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	4.3000e-004	4.3000e-004	0.0000	0.0000	4.5000e-004

Energy	5.0000e-004	4.5500e-003	3.8200e-003	3.0000e-005		3.5000e-004	3.5000e-004		3.5000e-004	3.5000e-004	0.0000	13.8565	13.8565	5.0000e-004	1.7000e-004	13.9209
Mobile	2.5833	4.8936	24.1346	0.0407	2.8460	0.0576	2.9036	0.7622	0.0529	0.8151	0.0000	3,222.8604	3,222.8604	0.1513	0.0000	3,226.0372
Waste						0.0000	0.0000		0.0000	0.0000	2.6247	0.0000	2.6247	0.1551	0.0000	5.8821
Water						0.0000	0.0000		0.0000	0.0000	0.1011	0.7007	0.8018	0.0104	2.5000e-004	1.0987
Total	**2.5988**	**4.8981**	**24.1387**	**0.0407**	**2.8460**	**0.0579**	**2.9040**	**0.7622**	**0.0532**	**0.8155**	**2.7258**	**3,237.4180**	**3,240.1438**	**0.3173**	**4.2000e-004**	**3,246.9393**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.0150	0.0000	2.3000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	4.3000e-004	4.3000e-004	0.0000	0.0000	4.5000e-004
Energy	5.0000e-004	4.5500e-003	3.8200e-003	3.0000e-005		3.5000e-004	3.5000e-004		3.5000e-004	3.5000e-004	0.0000	13.8565	13.8565	5.0000e-004	1.7000e-004	13.9209
Mobile	2.5833	4.8936	24.1346	0.0407	2.8460	0.0576	2.9036	0.7622	0.0529	0.8151	0.0000	3,222.8604	3,222.8604	0.1513	0.0000	3,226.0372
Waste						0.0000	0.0000		0.0000	0.0000	2.6247	0.0000	2.6247	0.1551	0.0000	5.8821
Water						0.0000	0.0000		0.0000	0.0000	0.1011	0.7007	0.8018	0.0104	2.5000e-004	1.0985
Total	**2.5988**	**4.8981**	**24.1387**	**0.0407**	**2.8460**	**0.0579**	**2.9040**	**0.7622**	**0.0532**	**0.8155**	**2.7258**	**3,237.4180**	**3,240.1438**	**0.3173**	**4.2000e-004**	**3,246.9392**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	2.5833	4.8936	24.1346	0.0407	2.8460	0.0576	2.9036	0.7622	0.0529	0.8151	0.0000	3,222.8604	3,222.8604	0.1513	0.0000	3,226.0372
Unmitigated	2.5833	4.8936	24.1346	0.0407	2.8460	0.0576	2.9036	0.7622	0.0529	0.8151	0.0000	3,222.8604	3,222.8604	0.1513	0.0000	3,226.0372

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Gasoline/Service Station	4,390.08	3,870.00	3870.00	7,647,682	7,647,682
Total	4,390.08	3,870.00	3,870.00	7,647,682	7,647,682

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by

Gasoline/Service Station	9.50	7.30	7.30	2.00	79.00	19.00	67	0	33

LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
0.527627	0.065080	0.176461	0.145848	0.036424	0.004888	0.009671	0.020781	0.001221	0.001487	0.006359	0.002101	0.002052

5.0 Energy Detail

4.4 Fleet Mix

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	8.9006	8.9006	4.0000e-004	8.0000e-005	8.9348
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	8.9006	8.9006	4.0000e-004	8.0000e-005	8.9348
NaturalGas Mitigated	5.0000e-004	4.5500e-003	3.8200e-003	3.0000e-005		3.5000e-004	3.5000e-004		3.5000e-004	3.5000e-004	0.0000	4.9559	4.9559	9.0000e-005	9.0000e-005	4.9861
NaturalGas Unmitigated	5.0000e-004	4.5500e-003	3.8200e-003	3.0000e-005		3.5000e-004	3.5000e-004		3.5000e-004	3.5000e-004	0.0000	4.9559	4.9559	9.0000e-005	9.0000e-005	4.9861

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Gasoline/Service Station	92870.6	5.0000e-004	4.5500e-003	3.8200e-003	3.0000e-005		3.5000e-004	3.5000e-004		3.5000e-004	3.5000e-004	0.0000	4.9559	4.9559	9.0000e-005	9.0000e-005	4.9861
Total		**5.0000e-004**	**4.5500e-003**	**3.8200e-003**	**3.0000e-005**		**3.5000e-004**	**3.5000e-004**		**3.5000e-004**	**3.5000e-004**	**0.0000**	**4.9559**	**4.9559**	**9.0000e-005**	**9.0000e-005**	**4.9861**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Gasoline/Service Station	92870.6	5.0000e-004	4.5500e-003	3.8200e-003	3.0000e-005		3.5000e-004	3.5000e-004		3.5000e-004	3.5000e-004	0.0000	4.9559	4.9559	9.0000e-005	9.0000e-005	4.9861
Total		**5.0000e-004**	**4.5500e-003**	**3.8200e-003**	**3.0000e-005**		**3.5000e-004**	**3.5000e-004**		**3.5000e-004**	**3.5000e-004**	**0.0000**	**4.9559**	**4.9559**	**9.0000e-005**	**9.0000e-005**	**4.9861**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Gasoline/Service Station	30595.4	8.9006	4.0000e-004	8.0000e-005	8.9348
Total		**8.9006**	**4.0000e-004**	**8.0000e-005**	**8.9348**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Gasoline/Service Station	30595.4	8.9006	4.0000e-004	8.0000e-005	8.9348
Total		**8.9006**	**4.0000e-004**	**8.0000e-005**	**8.9348**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0150	0.0000	2.3000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	4.3000e-004	4.3000e-004	0.0000	0.0000	4.5000e-004
Unmitigated	0.0150	0.0000	2.3000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	4.3000e-004	4.3000e-004	0.0000	0.0000	4.5000e-004

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	1.7700e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0132					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	2.0000e-005	0.0000	2.3000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	4.3000e-004	4.3000e-004	0.0000	0.0000	4.5000e-004
Total	**0.0150**	**0.0000**	**2.3000e-004**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**4.3000e-004**	**4.3000e-004**	**0.0000**	**0.0000**	**4.5000e-004**

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	1.7700e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0132					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	2.0000e-005	0.0000	2.3000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	4.3000e-004	4.3000e-004	0.0000	0.0000	4.5000e-004
Total	**0.0150**	**0.0000**	**2.3000e-004**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**4.3000e-004**	**4.3000e-004**	**0.0000**	**0.0000**	**4.5000e-004**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	0.8018	0.0104	2.5000e-004	1.0985
Unmitigated	0.8018	0.0104	2.5000e-004	1.0987

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Gasoline/Service Station	0.318765 / 0.195372	0.8018	0.0104	2.5000e-004	1.0987
Total		**0.8018**	**0.0104**	**2.5000e-004**	**1.0987**

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Gasoline/Service Station	0.318765 / 0.195372	0.8018	0.0104	2.5000e-004	1.0985
Total		**0.8018**	**0.0104**	**2.5000e-004**	**1.0985**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	2.6247	0.1551	0.0000	5.8821
Unmitigated	2.6247	0.1551	0.0000	5.8821

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Gasoline/Service Station	12.93	2.6247	0.1551	0.0000	5.8821
Total		**2.6247**	**0.1551**	**0.0000**	**5.8821**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Gasoline/Service Station	12.93	2.6247	0.1551	0.0000	5.8821
Total		**2.6247**	**0.1551**	**0.0000**	**5.8821**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Vegetation

APPENDIX B

Emissions Calculations

Concord Costco Fuel Station Expansion
TAC Emissions from On- and Off-Site Vehicles

Existing Conditions - Off-Site Travel (Monument Blvd)

					Emissions Factors					Annual Emissions (lb/year)					Average Hourly Emissions (lb/hr)*				
Vehicle Type	Fuel Type	Average Daily Trips	Trip Distance (ft)	Trip Distance (mi)	PM2.5 Exhaust (g/VMT)	Total PM2.5 (g/VMT)	TOG Exhaust (g/VMT)	TOG Run Loss (g/VMT)	Operation Schedule (hrs/day)	DPM Exhaust	PM2.5 Exhaust	Total PM2.5	TOG Exhaust	TOG Running Loss	DPM Exhaust	PM2.5 Exhaust	Total PM2.5	TOG Exhaust	TOG Running Loss
LDA	Gas	3,446	1,123	0.213	0.00320	0.02095	0.07818	0.05725	17	0.00	1.89	12.36	46.11	33.77	0.00E+00	3.04E-04	1.99E-03	7.43E-03	5.44E-03
	Diesel	0	1,123	0.213	0.04110	0.05885	0.06986	0	17	0.00	0.00	0.00	0.00	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
LDT1	Gas	396	1,123	0.213	0.00690	0.02465	0.19016	0.19243	17	0.00	0.47	1.67	12.90	13.06	0.00E+00	7.54E-05	2.70E-04	2.08E-03	2.10E-03
	Diesel	0	1,123	0.213	0.08471	0.10246	0.12546	0	17	0.00	0.00	0.00	0.00	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
LDT2	Gas	1,101	1,123	0.213	0.00325	0.02100	0.09928	0.09152	17	0.00	0.61	3.96	18.71	17.25	0.00E+00	9.87E-05	6.38E-04	3.02E-03	2.78E-03
	Diesel	0	1,123	0.213	0.05445	0.07220	0.08407	0	17	0.00	0.00	0.00	0.00	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
LHD1	Gas	215	1,123	0.213	0.00302	0.02077	0.24230	0.26859	17	0.00	0.11	0.77	8.94	9.91	0.00E+00	1.79E-05	1.23E-04	1.44E-03	1.60E-03
	Diesel	0	1,123	0.213	0.05810	0.09386	0.31903	0	17	0.00	0.00	0.00	0.00	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
LHD2	Gas	31	1,123	0.213	0.00269	0.02044	0.19508	0.27457	17	0.00	0.01	0.11	1.03	1.45	0.00E+00	2.28E-06	1.74E-05	1.66E-04	2.34E-04
	Diesel	0	1,123	0.213	0.05404	0.09526	0.28501	0	17	0.00	0.00	0.00	0.00	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MDV	Gas	779	1,123	0.213	0.00391	0.02166	0.17881	0.11557	17	0.00	0.52	2.89	23.84	15.41	0.00E+00	8.40E-05	4.65E-04	3.84E-03	2.48E-03
	Diesel	0	1,123	0.213	0.04192	0.05967	0.06384	0	17	0.00	0.00	0.00	0.00	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total Passenger	***All***	**5969**	***1,123***	***0.213***	**-**	**-**	**-**	**-**	***17***	***0.0***	***3.6***	***21.7***	***111.5***	***90.8***	***0.00E+00***	***5.83E-04***	***3.50E-03***	***1.80E-02***	***1.46E-02***
Passenger	*Gas*	*5969*													*0.00E+00*	*5.83E-04*	*3.50E-03*	*1.80E-02*	*1.46E-02*
Passenger	*Diesel*	*0*													*0.00E+00*	*0.00E+00*	*0.00E+00*	*0.00E+00*	*0.00E+00*
Delivery Trucks	***Diesel***	***11***	***1,123***	***0.213***	***0.098271***	***0.132928***	***0.379861***	***0***	***17***	***0.19***	***0.19***	***0.25***	***0.72***	***0.00***	***2.98E-05***	***2.98E-05***	***4.033E-05***	***0.0001153***	***0.00E+00***
Total	**All**	**5,980**	***1,123***	***0.213***	**-**	**-**	**-**	**-**	**17**	**0.2**	**3.8**	**22.0**	**112.2**	**90.8**	**2.98E-05**	**6.12E-04**	**3.55E-03**	**1.81E-02**	**1.46E-02**

* Only TOG emissions from gasoline vehicles used for TAC modeling

Existing Conditions - On-Site Travel (5 mph)

					Emissions Factors					Annual Emissions (lb/year)					Average Hourly Emissions (lb/hr)[5]				
Vehicle Type	Fuel Type	Average Daily Trips	Trip Distance (ft)	Trip Distance (mi)	PM2.5 Exhaust (g/VMT)	Total PM2.5 (g/VMT)	TOG Exhaust (g/VMT)	TOG Run Loss (g/VMT)	Operation Schedule (hrs/day)	DPM Exhaust	PM2.5 Exhaust	Total PM2.5	TOG Exhaust	TOG Running Loss	DPM Exhaust	PM2.5 Exhaust	Total PM2.5	TOG Exhaust	TOG Running Loss
LDA	Gas	3,446	664	0.126	0.01058	0.02833	0.24278	0.05725	17	0.00	3.69	9.88	84.66	19.97	0.00E+00	5.94E-04	1.59E-03	1.36E-02	3.22E-03
	Diesel	0	664	0.126	0.07349	0.09124	0.12537	0	17	0.00	0.00	0.00	0.00	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
LDT1	Gas	396	664	0.126	0.02178	0.03953	0.56898	0.19243	17	0.00	0.87	1.59	22.83	7.72	0.00E+00	1.41E-04	2.56E-04	3.68E-03	1.24E-03
	Diesel	0	664	0.126	0.14774	0.16549	0.21897	0	17	0.00	0.00	0.00	0.00	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
LDT2	Gas	1,101	664	0.126	0.01072	0.02847	0.31297	0.09152	17	0.00	1.19	3.17	34.88	10.20	0.00E+00	1.93E-04	5.11E-04	5.62E-03	1.64E-03
	Diesel	0	664	0.126	0.09474	0.11249	0.14686	0	17	0.00	0.00	0.00	0.00	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
LHD1	Gas	215	664	0.126	0.00803	0.02578	0.64465	0.26859	17	0.00	0.18	0.56	14.06	5.86	0.00E+00	2.82E-05	9.06E-05	2.27E-03	9.44E-04
	Diesel	0	664	0.126	0.10210	0.13786	0.56061	0	17	0.00	0.00	0.00	0.00	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
LHD2	Gas	31	664	0.126	0.00715	0.02490	0.51915	0.27457	17	0.00	0.02	0.08	1.62	0.86	0.00E+00	3.60E-06	1.25E-05	2.61E-04	1.38E-04
	Diesel	0	664	0.126	0.09496	0.13618	0.50084	0	17	0.00	0.00	0.00	0.00	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MDV	Gas	779	664	0.126	0.01288	0.03063	0.57179	0.11557	17	0.00	1.02	2.41	45.07	9.11	0.00E+00	1.64E-04	3.89E-04	7.26E-03	1.47E-03
	Diesel	0	664	0.126	0.07447	0.09222	0.11360	0	17	0.00	0.00	0.00	0.00	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total Passenger	***All***	**5969**	664	***0.126***	**-**	**-**	**-**	**-**	***17***	***0.0***	***7.0***	***17.7***	***203.1***	***53.7***	***0.00E+00***	***1.12E-03***	***2.85E-03***	***3.27E-02***	***8.66E-03***
Passenger	*Gas*	*5969*													*0.00E+00*	*1.12E-03*	*2.85E-03*	*3.27E-02*	*8.66E-03*
Passenger	*Diesel*	*0*													*0.00E+00*	*0.00E+00*	*0.00E+00*	*0.00E+00*	*0.00E+00*
Delivery Trucks	***Diesel***	***11***	***664***	***0.126***	***0.159122***	***0.193779***	***3.432655***	***0***	***17***	***0.18***	***0.18***	***0.22***	***3.82***	***0.00***	***2.85E-05***	***2.85E-05***	***3.476E-05***	***0.0006158***	***0.00E+00***
Total	**All**	**5,980**	***664***	***0.126***	**-**	**-**	**-**	**-**	**17**	**0.2**	**7.1**	**17.9**	**206.9**	**53.7**	**2.85E-05**	**1.15E-03**	**2.89E-03**	**3.34E-02**	**8.66E-03**

* Only TOG emissions from gasoline vehicles used for TAC modeling

Existing Conditions - On-Site Idling

				Emissions Factors					Annual Emissions (lb/year)					Average Hourly Emissions (lb/hr)[5]				
Vehicle Type	Fuel Type	Daily Idle Hours		PM2.5 Exhaust (g/V-hr)	Total PM2.5 (g/V-hr)	TOG Exhaust (g/V-hr)	TOG Run Loss (g/V-hr)	Operation Schedule (hrs/day)	DPM Exhaust	PM2.5 Exhaust	Total PM2.5	TOG Exhaust	TOG Running Loss	DPM Exhaust	PM2.5 Exhaust	Total PM2.5	TOG Exhaust	TOG Running Loss
LDA	Gas	97		0.05289	0.05289	0.04856	0.01145	17	0.00	4.13	4.13	3.79	0.89	0.00E+00	6.65E-04	6.65E-04	6.11E-04	1.44E-04
	Diesel	0		0.36746	0.36746	0.02507	0	17	0.00	0.00	0.00	0.00	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
LDT1	Gas	11		0.10888	0.10888	0.11380	0.03849	17	0.00	0.98	0.98	1.02	0.35	0.00E+00	1.58E-04	1.58E-04	1.65E-04	5.57E-05
	Diesel	0		0.73871	0.73871	0.04379	0	17	0.00	0.00	0.00	0.00	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
LDT2	Gas	31		0.05360	0.05360	0.06259	0.01830	17	0.00	1.34	1.34	1.56	0.46	0.00E+00	2.15E-04	2.15E-04	2.52E-04	7.36E-05
	Diesel	0		0.47371	0.47371	0.02937	0	17	0.00	0.00	0.00	0.00	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
LHD1	Gas	6		0.04014	0.04014	0.12893	0.05372	17	0.00	0.20	0.20	0.63	0.26	0.00E+00	3.16E-05	3.16E-05	1.01E-04	4.23E-05
	Diesel	0		0.51051	0.51051	0.11212	0	17	0.00	0.00	0.00	0.00	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
LHD2	Gas	1		0.03576	0.03576	0.10383	0.05491	17	0.00	0.02	0.02	0.07	0.04	0.00E+00	4.02E-06	4.02E-06	1.17E-05	6.18E-06
	Diesel	0		0.47482	0.47482	0.10017	0	17	0.00	0.00	0.00	0.00	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MDV	Gas	22		0.06441	0.06441	0.11436	0.02311	17	0.00	1.14	1.14	2.02	0.41	0.00E+00	1.83E-04	1.83E-04	3.25E-04	6.57E-05
	Diesel	0		0.37236	0.37236	0.02272	0	17	0.00	0.00	0.00	0.00	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total Passenger	***All***	**168**		**-**	**-**	**-**	**-**	***17***	***0.0***	***7.8***	***7.8***	***9.1***	***2.4***	***0.00E+00***	***1.26E-03***	***1.26E-03***	***1.47E-03***	***3.87E-04***
Passenger	*Gas*	*168*												*0.00E+00*	*1.26E-03*	*1.26E-03*	*1.47E-03*	*3.87E-04*
Passenger	*Diesel*	*0*												*0.00E+00*	*0.00E+00*	*0.00E+00*	*0.00E+00*	*0.00E+00*
Delivery Trucks	***Diesel***	***0.9***		***0.148691***	***0.148691***	***6.812058***	***0***	***17***	***0.11***	***0.11***	***0.11***	***5.02***	***0.00***	***1.77E-05***	***1.77E-05***	***1.768E-05***	***8.10E-04***	***0.00E+00***
Total	**All**	**169**		**-**	**-**	**-**	**-**	**17**	**0.1**	**7.9**	**7.9**	**14.1**	**2.4**	**1.77E-05**	**1.27E-03**	**1.27E-03**	**2.28E-03**	**3.87E-04**

Gas station operating hours: 5am - 10pm

* Only TOG emissions from gasoline vehicles used for TAC modeling

Projected Conditions - Off-Site Travel (Momument Blvd)

Vehicle Type	Fuel Type	Average Daily Trips	Trip Distance (ft)	Trip Distance (mi)	Emissions Factors: PM2.5 Exhaust (g/VMT)	Emissions Factors: Total PM2.5 (g/VMT)	Emissions Factors: TOG Exhaust (g/VMT)	Emissions Factors: TOG Run Loss (g/VMT)	Operation Schedule (hrs/day)	Annual Emissions (lb/year): DPM Exhaust	Annual Emissions: PM2.5 Exhaust	Annual Emissions: Total PM2.5	Annual Emissions: TOG Exhaust	Annual Emissions: TOG Running Loss	Average Hourly Emissions (lb/hr)[5]: DPM Exhaust	Average Hourly Emissions: PM2.5 Exhaust	Average Hourly Emissions: Total PM2.5	Average Hourly Emissions: TOG Exhaust	Average Hourly Emissions: TOG Running Loss
LDA	Gas	3,575	1,123	0.213	0.00320	0.02095	0.07818	0.05725	17	0.00	1.96	12.82	47.84	35.03	0.00E+00	3.16E-04	2.07E-03	7.71E-03	5.65E-03
	Diesel	2	1,123	0.213	0.04110	0.05885	0.06986	0	17	0.01	0.01	0.02	0.02	0.00	1.86E-06	1.86E-06	2.66E-06	3.16E-06	0.00E+00
LDT1	Gas	411	1,123	0.213	0.00690	0.02465	0.19016	0.19243	17	0.00	0.49	1.74	13.39	13.55	0.00E+00	7.83E-05	2.80E-04	2.16E-03	2.18E-03
	Diesel	1	1,123	0.213	0.08471	0.10246	0.12546	0	17	0.01	0.01	0.01	0.01	0.00	1.20E-06	1.20E-06	1.45E-06	1.77E-06	0.00E+00
LDT2	Gas	1,143	1,123	0.213	0.00325	0.02100	0.09928	0.09152	17	0.00	0.64	4.11	19.42	17.90	0.00E+00	1.02E-04	6.62E-04	3.13E-03	2.88E-03
	Diesel	0	1,123	0.213	0.05445	0.07220	0.08407	0	17	0.00	0.00	0.00	0.00	0.00	2.73E-07	2.73E-07	3.62E-07	4.21E-07	0.00E+00
LHD1	Gas	224	1,123	0.213	0.00302	0.02077	0.24230	0.26859	17	0.00	0.12	0.79	9.27	10.28	0.00E+00	1.86E-05	1.28E-04	1.49E-03	1.66E-03
	Diesel	112	1,123	0.213	0.05810	0.09386	0.31903	0	17	1.11	1.11	1.79	6.09	0.00	1.79E-04	1.79E-04	2.89E-04	9.82E-04	0.00E+00
LHD2	Gas	32	1,123	0.213	0.00269	0.02044	0.19508	0.27457	17	0.00	0.01	0.11	1.07	1.50	0.00E+00	2.37E-06	1.80E-05	1.72E-04	2.42E-04
	Diesel	212	1,123	0.213	0.05404	0.09526	0.28501	0	17	1.96	1.96	3.45	10.32	0.00	3.15E-04	3.15E-04	5.56E-04	1.66E-03	0.00E+00
MDV	Gas	808	1,123	0.213	0.00391	0.02166	0.17881	0.11557	17	0.00	0.54	3.00	24.73	15.98	0.00E+00	8.72E-05	4.83E-04	3.99E-03	2.58E-03
	Diesel	0	1,123	0.213	0.04192	0.05967	0.06384	0	17	0.00	0.00	0.00	0.00	0.00	5.27E-07	5.27E-07	7.51E-07	8.03E-07	0.00E+00
Total Passenger	***All***	**6519**	***1,123***	***0.213***	**-**	**-**	**-**	**-**	***17***	***3.1***	***6.8***	***27.8***	***132.2***	***94.2***	***4.98E-04***	***1.10E-03***	***4.49E-03***	***2.13E-02***	***1.52E-02***
Passenger	*Gas*	*6193*													*0.00E+00*	*6.05E-04*	*3.64E-03*	*1.86E-02*	*1.52E-02*
Passenger	*Diesel*	*326*													*4.98E-04*	*4.98E-04*	*8.50E-04*	*2.65E-03*	*0.00E+00*
Delivery Trucks	***Diesel***	***13***	***1,123***	***0.213***	***0.098271***	***0.132928***	***0.379861***	***0***	***17***	***0.22***	***0.22***	***0.30***	***0.85***	***0.00***	***3.52E-05***	***3.52E-05***	***4.766E-05***	***0.0001362***	***0.00E+00***
Total	**All**	**6,206**	***1,123***	***0.213***	**-**	**-**	**-**	**-**	**17**	**3.3**	**7.1**	**28.1**	**133.0**	**94.2**	**5.33E-04**	**1.14E-03**	**4.53E-03**	**2.14E-02**	**1.52E-02**

* Only TOG emissions from gasoline vehicles used for TAC modeling

Projected Conditions - On-Site Travel (5 mph)

Vehicle Type	Fuel Type	Average Daily Trips	Trip Distance (ft)	Trip Distance (mi)	Emissions Factors: PM2.5 Exhaust (g/VMT)	Emissions Factors: Total PM2.5 (g/VMT)	Emissions Factors: TOG Exhaust (g/VMT)	Emissions Factors: TOG Run Loss (g/VMT)	Operation Schedule (hrs/day)	Annual Emissions (lb/year): DPM Exhaust	Annual Emissions: PM2.5 Exhaust	Annual Emissions: Total PM2.5	Annual Emissions: TOG Exhaust	Annual Emissions: TOG Running Loss	Average Hourly Emissions (lb/hr)[5]: DPM Exhaust	Average Hourly Emissions: PM2.5 Exhaust	Average Hourly Emissions: Total PM2.5	Average Hourly Emissions: TOG Exhaust	Average Hourly Emissions: TOG Running Loss
LDA	Gas	3,575	664	0.126	0.01058	0.02833	0.24278	0.05725	17	0.00	3.83	10.25	87.84	20.71	0.00E+00	6.17E-04	1.65E-03	1.42E-02	3.34E-03
	Diesel	2	664	0.126	0.07349	0.09124	0.12537	0	17	0.01	0.01	0.02	0.02	0.00	1.96E-06	1.96E-06	2.44E-06	3.35E-06	0.00E+00
LDT1	Gas	411	664	0.126	0.02178	0.03953	0.56898	0.19243	17	0.00	0.91	1.65	23.68	8.01	0.00E+00	1.46E-04	2.65E-04	3.82E-03	1.29E-03
	Diesel	1	664	0.126	0.14774	0.16549	0.21897	0	17	0.01	0.01	0.01	0.01	0.00	1.24E-06	1.24E-06	1.38E-06	1.83E-06	0.00E+00
LDT2	Gas	1,143	664	0.126	0.01072	0.02847	0.31297	0.09152	17	0.00	1.24	3.29	36.19	10.58	0.00E+00	2.00E-04	5.31E-04	5.83E-03	1.71E-03
	Diesel	0	664	0.126	0.09474	0.11249	0.14686	0	17	0.00	0.00	0.00	0.00	0.00	2.81E-07	2.81E-07	3.33E-07	4.35E-07	0.00E+00
LHD1	Gas	224	664	0.126	0.00803	0.02578	0.64465	0.26859	17	0.00	0.18	0.58	14.59	6.08	0.00E+00	2.93E-05	9.40E-05	2.35E-03	9.79E-04
	Diesel	112	664	0.126	0.10210	0.13786	0.56061	0	17	1.15	1.15	1.56	6.33	0.00	1.86E-04	1.86E-04	2.51E-04	1.02E-03	0.00E+00
LHD2	Gas	32	664	0.126	0.00715	0.02490	0.51915	0.27457	17	0.00	0.02	0.08	1.68	0.89	0.00E+00	3.73E-06	1.30E-05	2.71E-04	1.43E-04
	Diesel	212	664	0.126	0.09496	0.13618	0.50084	0	17	2.03	2.03	2.92	10.73	0.00	3.28E-04	3.28E-04	4.70E-04	1.73E-03	0.00E+00
MDV	Gas	808	664	0.126	0.01288	0.03063	0.57179	0.11557	17	0.00	1.05	2.51	46.76	9.45	0.00E+00	1.70E-04	4.04E-04	7.54E-03	1.52E-03
	Diesel	0	664	0.126	0.07447	0.09222	0.11360	0	17	0.00	0.00	0.00	0.01	0.00	5.54E-07	5.54E-07	6.86E-07	8.45E-07	0.00E+00
Total Passenger	***All***	**6519**	***664***	***0.126***	**-**	**-**	**-**	**-**	***17***	***3.2***	***10.4***	***22.9***	***227.8***	***55.7***	***5.18E-04***	***1.68E-03***	***3.68E-03***	***3.67E-02***	***8.98E-03***
Passenger	*Gas*	*6193*													*0.00E+00*	*1.17E-03*	*2.96E-03*	*3.40E-02*	*8.98E-03*
Passenger	*Diesel*	*326*													*5.18E-04*	*5.18E-04*	*7.26E-04*	*2.76E-03*	*0.00E+00*
Delivery Trucks	***Diesel***	***13***	***664***	***0.126***	***0.159122***	***0.193779***	***3.432655***	***0***	***17***	***0.21***	***0.21***	***0.25***	***4.52***	***0.00***	***3.37E-05***	***3.37E-05***	***4.108E-05***	***7.28E-04***	***0.00E+00***
Total	**All**	**6,206**	***664***	***0.126***	**-**	**-**	**-**	**-**	**17**	**3.4**	**10.7**	**23.1**	**232.4**	**55.7**	**5.51E-04**	**1.72E-03**	**3.72E-03**	**3.74E-02**	**8.98E-03**

* Only TOG emissions from gasoline vehicles used for TAC modeling

Projected Conditions - On-Site Idling

Vehicle Type	Fuel Type	Daily Idle Hours	Emissions Factors: PM2.5 Exhaust (g/V-hr)	Emissions Factors: Total PM2.5 (g/V-hr)	Emissions Factors: TOG Exhaust (g/V-hr)	Emissions Factors: TOG Run Loss (g/V-hr)	Operation Schedule (hrs/day)	Annual Emissions (lb/year): DPM Exhaust	Annual Emissions: PM2.5 Exhaust	Annual Emissions: Total PM2.5	Annual Emissions: TOG Exhaust	Annual Emissions: TOG Running Loss	Average Hourly Emissions (lb/hr)[5]: DPM Exhaust	Average Hourly Emissions: PM2.5 Exhaust	Average Hourly Emissions: Total PM2.5	Average Hourly Emissions: TOG Exhaust	Average Hourly Emissions: TOG Running Loss
LDA	Gas	47	0.05289	0.05289	0.04856	0.01145	17	0.00	1.98	1.98	1.82	0.43	0.00E+00	3.20E-04	3.20E-04	2.94E-04	6.92E-05
	Diesel	0	0.36746	0.36746	0.02507	0	17	0.01	0.01	0.01	0.00	0.00	1.02E-06	1.02E-06	1.02E-06	6.95E-08	0.00E+00
LDT1	Gas	5	0.10888	0.10888	0.11380	0.03849	17	0.00	0.47	0.47	0.49	0.17	0.00E+00	7.57E-05	7.57E-05	7.91E-05	2.68E-05
	Diesel	0	0.73871	0.73871	0.04379	0	17	0.00	0.00	0.00	0.00	0.00	6.40E-07	6.40E-07	6.40E-07	3.80E-08	0.00E+00
LDT2	Gas	15	0.05360	0.05360	0.06259	0.01830	17	0.00	0.64	0.64	0.75	0.22	0.00E+00	1.04E-04	1.04E-04	1.21E-04	3.54E-05
	Diesel	0	0.47371	0.47371	0.02937	0	17	0.00	0.00	0.00	0.00	0.00	1.46E-07	1.46E-07	1.46E-07	9.02E-09	0.00E+00
LHD1	Gas	3	0.04014	0.04014	0.12893	0.05372	17	0.00	0.09	0.09	0.30	0.13	0.00E+00	1.52E-05	1.52E-05	4.87E-05	2.03E-05
	Diesel	1	0.51051	0.51051	0.11212	0	17	0.60	0.60	0.60	0.13	0.00	9.63E-05	9.63E-05	9.63E-05	2.12E-05	0.00E+00
LHD2	Gas	0	0.03576	0.03576	0.10383	0.05491	17	0.00	0.01	0.01	0.03	0.02	0.00E+00	1.93E-06	1.93E-06	5.62E-06	2.97E-06
	Diesel	3	0.47482	0.47482	0.10017	0	17	1.05	1.05	1.05	0.22	0.00	1.70E-04	1.70E-04	1.70E-04	3.58E-05	0.00E+00
MDV	Gas	11	0.06441	0.06441	0.11436	0.02311	17	0.00	0.55	0.55	0.97	0.20	0.00E+00	8.80E-05	8.80E-05	1.56E-04	3.16E-05
	Diesel	0	0.37236	0.37236	0.02272	0	17	0.00	0.00	0.00	0.00	0.00	2.87E-07	2.87E-07	2.87E-07	1.75E-08	0.00E+00
Total Passenger	***All***	**85**	**-**	**-**	**-**	**-**	***17***	***1.7***	***5.4***	***5.4***	***4.7***	***1.2***	***2.68E-04***	***8.72E-04***	***8.72E-04***	***7.61E-04***	***1.86E-04***
Passenger	*Gas*	*81*											*0.00E+00*	*6.04E-04*	*6.04E-04*	*7.04E-04*	*1.86E-04*
Passenger	*Diesel*	*4*											*2.68E-04*	*2.68E-04*	*2.68E-04*	*5.71E-05*	*0.00E+00*
Delivery Trucks	***Diesel***	***1.1***	***0.148691***	***0.148691***	***6.812058***	***0***	***17***	***0.13***	***0.13***	***0.13***	***5.94***	***0.00***	***2.09E-05***	***2.09E-05***	***2.089E-05***	***9.57E-04***	***0.00E+00***
Total	**All**	**82**	**-**	**-**	**-**	**-**	**17**	**1.8**	**5.5**	**5.5**	**10.7**	**1.2**	**2.89E-04**	**8.93E-04**	**8.93E-04**	**1.72E-03**	**1.86E-04**

Gas station operating hours: 5am - 10pm

* Only TOG emissions from gasoline vehicles used for TAC modeling

Concord Costco
Vehicle Distribution

Vehicle Type	Fraction of All Vehicles	Fraction of All LDA-MDV	Fraction Diesel of Vehicle Class	Fraction Diesel of of All LDA-MDV
LDA	0.5464	0.57733	0.00442	0.00502
LDT1	0.0629	0.06642	0.00138	0.00157
LDT2	0.1746	0.18450	0.00049	0.00056
LHD1	0.0342	0.03610	0.30085	0.34223
LHD2	0.0049	0.00517	0.57072	0.64922
MDV	0.1235	0.13049	0.00123	0.00140
Total	**0.9465**	**1.0000**	**0.8791**	**1.0000**

Emission Factors from EMFAC2011 for SF Bay Area

		Speed = Idle					Speed = 5 mph					Speed = 20 mph				
Vehicle Type	Fuel Type	PM2.5 Exhaust (g/V-hr)	Tire & Brake Wear (g/V-hr)	Total PM2.5 (g/V-hr)	TOG Exhaust (g/V-hr)	TOG Run Loss (g/V-hr)	PM2.5 Exhaust (g/VMT)	Tire & Brake Wear (g/VMT)	Total PM2.5 (g/VMT)	TOG Exhaust (g/VMT)	TOG Run Loss (g/VMT)	PM2.5 Exhaust (g/VMT)	Tire & Brake Wear (g/VMT)	Total PM2.5 (g/VMT)	TOG Exhaust (g/VMT)	TOG Run Loss (g/VMT)
LDA	Gas	0.0528898	0	0.0528898	0.0485558	0.0114505	0.010578	0.017749909	0.02832787	0.24277919	0.05725262	0.00320132	0.01774991	0.020951	0.078184	0.057253
	Diesel	0.3674614	0	0.3674614	0.0250737	0	0.0734923	0.017749909	0.09124219	0.12536859	0	0.04110209	0.01774991	0.058852	0.069861	0
LDT1	Gas	0.1088768	0	0.1088768	0.1137957	0.0384869	0.0217754	0.017749909	0.03952528	0.56897873	0.19243449	0.00689958	0.01774991	0.024649	0.190161	0.192434
	Diesel	0.7387144	0	0.7387144	0.0437942	0	0.1477429	0.017749909	0.1654928	0.21897116	0	0.08470811	0.01774991	0.102458	0.125462	0
LDT2	Gas	0.0535985	0	0.0535985	0.062595	0.0183036	0.0107197	0.01774991	0.0284696	0.31297499	0.0915178	0.0032486	0.01774991	0.020999	0.099281	0.091518
	Diesel	0.4737069	0	0.4737069	0.0293728	0	0.0947414	0.017749909	0.1124913	0.1468639	0	0.05445237	0.01774991	0.072202	0.084066	0
LHD1	Gas	0.0401421	0	0.0401421	0.1289309	0.0537185	0.0080284	0.017749909	0.02577834	0.64465434	0.26859258	0.00301598	0.01774991	0.020766	0.242299	0.268593
	Diesel	0.5105091	0	0.5105091	0.1121214	0	0.1021018	0.035759811	0.13786162	0.56060718	0	0.05810319	0.03575981	0.093863	0.319025	0
LHD2	Gas	0.0357572	0	0.0357572	0.1038304	0.0549146	0.0071514	0.01774991	0.02490136	0.51915213	0.27457287	0.00268653	0.01774991	0.020436	0.195077	0.274573
	Diesel	0.4748196	0	0.4748196	0.1001681	0	0.0949639	0.04121978	0.1361837	0.50084071	0	0.05404122	0.04121978	0.095261	0.285014	0
MDV	Gas	0.0644141	0	0.0644141	0.1143587	0.0231147	0.0128828	0.017749909	0.03063272	0.57179342	0.11557369	0.00391058	0.01774991	0.02166	0.178807	0.115574
	Diesel	0.3723551	0	0.3723551	0.0227192	0	0.074471	0.017749909	0.09222094	0.11359604	0	0.04191879	0.01774991	0.059669	0.063843	0
HHDT	Diesel	0.148691	0	0.148691	6.812058	0	0.1591218	0.034656807	0.19377858	3.43265525	0	0.09827113	0.03465681	0.132928	0.379861	0

Concord Costco Fuel Station - Existing & Projected Benzene Emissions

Estimated Annual Gasoline Throughput = 21,600,000 gallons/year

TOG Emission Factors and Annual Emissions

Emission Source	TOG[1] Emission Factor ($lb/10^3$ gallon)	TOG Annual Emissions (lb/year)
Fueling[2]		
Non-ORVR Vehicles	0.42	1,814.4
ORVR Vehicles	0.021	362.9
Bulk Transfer Losses	0.15	3,240.0
Pressure Driven Losses	0.024	518.4
Fueling - Spillage	0.24	5,184.0
Gasoline Hose Losses	0.009	194.4
Total	**0.532**	**11,314.1**

TOG = total organic gas
ORVR = onboard refueling vapor recovery
1. Emission factors from CARB "Revised Emissions Factors for Gasoline Marketing Operations at California Gasoline Dispensing Facilities". December 23, 2013 (CARB, 2013). Assumes use of enhanced vapor recovery systems.
2. Fueling emissions based on CARB data for 2016 of 80% of vehicles use ORVR (CARB, 2013).

Benzene Emissions

Source	Annual Gasoline Throughput (gallons/year)	Annual TOG Emissions (lb/year)	Percent[1] Benzene in Vapor (%)	Operation[2] Schedule (hrs/day)	Benzene Emissions Annual Average (lb/year)	Benzene Emissions Average Hourly (lb/hr)
Fuel Station	21,600,000	11,314	0.3%	17	33.94	0.00547

Notes:
1. CAPCOA Air Toxics "Hot Spots" Program, Gasoline Service Station Industrywide Risk Assessment Guidelines, November 1997.
2. Daily operation hours assumed to be 5:00 AM to 10:00 PM, 365 days per year

Gas Station Modeling - Benzene Emissions and Volume Source Parameters

Emission Source	Percent of Total Emissions	Total Average Hourly Emissions (lb/hr)	Number of Volume Sources	Emissions per Volume (lb/hr)	Volume Source Dimensions (meters) Length	Width	Height	Volume Source Release Height (meters)
Refueling and Tank Losses	52%	0.0029	4	0.00072	10	10	4	1
Spillage and Hose Losses	48%	0.0026	4	0.00065	10	10	4	0

Concord Costco Gas Station Expansion
Health Risk Impact Summary

Scenario/Emission Source	Increased Cancer Risk (per million)	Chronic Hazard Index	Acute Hazard Index	Maximum Annual PM2.5 ($\mu g/m^3$)
Existing Condition				
Vehicle Emissions	0.61	0.0013	0.0065	0.023
Gas Station Emissions	0.40	0.0001	0.0013	0.000
Total	**1.01**	**0.001**	**0.008**	**0.023**
Projected Condition				
Vehicle Emissions	2.62	0.0021	0.0068	0.029
Gas Station Emissions	0.40	0.0001	0.0013	0.000
Total	**3.02**	**0.002**	**0.008**	**0.03**

Concord Costco Gas Station Expansion - Health Risks

Cancer Risks From Off-site and On-site Vehicle Emissions

Existing Conditions

TAC Emission Rates	
Source Type/TAC Emissions	**Annual (lb/yr)**
Total PM2.5	47.8
DPM	0.5
TOG Exhaust	333.3
TOG Running Loss	146.9

Modeling Information

Model:	ISCST3
Source	Vehicle Emissions from Off-site & On-site roads, and idling
Source Types	Line-Volumes for on & off-site vehicle travel and volume for on-site idling
Distance to Residences from Road (ft)	Variable. Minimum distance = 100 ft
Receptor Height (m)	1.5 m
Meteorological Data	BAAQMD - 2001-2005 Hourly Concord STP data

	Line-Volume Source Parameters	
Emission Source	**Plume Height (m)**	**Release Height (m)**
On-site vehicles line source	2.6	1.3
Off-site vehicle line source	2.6	1.3
Volume source for idling	4.0	1.3

Cancer Risk Calculation Method

Inhalation Dose = C_{air} x DBR x A x HD x EF x ED x 10^{-6} / AT

Where: C_{air} = concentration in air (µg/m^3)
DBR = daily breathing rate (L/kg body weight-day)
A = Inhalation absorption factor
EF = Exposure frequency (days/year)
HD = daily exposure (hours/day/24)
ED = Exposure duration (years)
AT = Averaging time period over which exposure is averaged.
10^{-6} = Conversion factor

Inhalation Dose Factors

	Value[1]							
Exposure Type	**DBR (L/kg BW-day)**	**A (-)**	**Exposure (hr/day)**	**Exposure (days/week)**	**Exposure (week/year)**	**EF (days/yr)**	**ED (Years)**	**AT (days)**
Residential - 70 year exposure	302	1	24	7	50	350	70	25,550

[1] Default values recommended by OEHHA& Bay Area Air Quality Management District

Cancer Risk (per million) = Inhalation Dose x ASF x CPF x 10^6
= URF x Cair x ASF

Where: CPF = Cancer potency factor (mg/kg-day)$^{-1}$
ASF = Age Sensitivity Factor
URF =Unit risk factor (cancer risk per µg/m^3)

Unit Risk Factor for DPM

Exposure Type/TAC	**CPF (mg/kg-day)$^{-1}$**	**ASF (-)**
Residential - Adult		
DPM	1.10E+00	1.7
TOG Exhaust	6.28E-03	1.7
TOG Running Loss	3.70E-04	1.7

Model Results and Maximum Cancer Risks

	Maximimum Concentration						
Exposure Type/TAC	**1-Hour (µg/m^3)**	**Annual Ave (µg/m^3)**	**Cancer Risk (per million)**	**Chronic REL (µg/m^3)**	**Chronic Hazard Index**	**Acute REL (µg/m^3)**	**Acute Hazard Index**
Residential							
Total PM2.5	-	0.0233	-		-	-	-
DPM	-	0.00021	0.114	5	0.0000	-	-
TOG Exhaust	9.337	0.1550	0.479	284	0.0005	3282	0.0028
TOG Running Loss	2.813	0.0827	0.015	120	0.0007	762	0.0037
Total			**0.61**		**0.0013**		**0.0065**

Concord Costco Gas Station Expansion - Health Risks

Cancer Risks From Off-site and On-site Vehicle Emissions

Projected Conditions

TAC Emission Rates	
Source Type/TAC Emissions	**Annual (lb/yr)**
Total PM2.5	56.8
DPM	8.5
TOG Exhaust	367.2
TOG Running Loss	151.1

Modeling Information	
Model:	ISCST3
Source	Vehicle Emissions from Off-site & On-site roads, and idling
Source Types	Line-Volumes for on & off-site vehicle travel and volume for on-site idling
Distance to Residences from Road (ft)	Variable. Minimum distance = 100 ft
Receptor Height (m)	1.5 m
Meteorological Data	BAAQMD - 2001-2005 Hourly Concord STP data

	Line-Volume Source Parameters	
Emission Source	**Plume Height (m)**	**Release Height (m)**
On-site vehicles line source	2.6	1.3
Off-site vehicle line source	2.6	1.3
Volume source for idling	4.0	1.3

Cancer Risk Calculation Method

Inhalation Dose = C_{air} x DBR x A x HD x EF x ED x 10^{-6} / AT

Where: C_{air} = concentration in air (µg/m^3)
DBR = daily breathing rate (L/kg body weight-day)
A = Inhalation absorption factor
EF = Exposure frequency (days/year)
HD = daily exposure (hours/day/24)
ED = Exposure duration (years)
AT = Averaging time period over which exposure is averaged.
10^{-6} = Conversion factor

Inhalation Dose Factors

	Value[1]							
Exposure Type	**DBR (L/kg BW-day)**	**A (-)**	**Exposure (hr/day)**	**Exposure (days/week)**	**Exposure (week/year)**	**EF (days/yr)**	**ED (Years)**	**AT (days)**
Residential - 70 year exposure	302	1	24	7	50	350	70	25,550

[1] Default values recommended by OEHHA& Bay Area Air Quality Management District

Cancer Risk (per million) = Inhalation Dose x ASF x CPF x 10^6
= URF x Cair x ASF

Where: CPF = Cancer potency factor (mg/kg-day)$^{-1}$
ASF = Age Sensitivity Factor
URF =Unit risk factor (cancer risk per µg/m^3)

Unit Risk Factor for DPM

Exposure Type/TAC	**CPF (mg/kg-day)$^{-1}$**	**ASF (-)**
Residential - Adult		
DPM	1.10E+00	1.7
TOG Exhaust	6.28E-03	1.7
TOG Running Loss	3.70E-04	1.7

Model Results and Maximum Cancer Risks

	Maximimum Concentration						
Exposure Type/TAC	**1-Hour (µg/m^3)**	**Annual Ave (µg/m^3)**	**Cancer Risk (per million)**	**Chronic REL (µg/m^3)**	**Chronic Hazard Index**	**Acute REL (µg/m^3)**	**Acute Hazard Index**
Residential							
Total PM2.5	-	0.0290	-		-	-	-
DPM	-	0.00389	2.107	5	0.0008	-	-
TOG Exhaust	9.704	0.1597	0.494	284	0.0006	3282	0.0030
TOG Running Loss	2.920	0.0858	0.016	120	0.0007	762	0.0038
Total			**2.62**		**0.0021**		**0.0068**

Concord Costco Fuel Station - Existing & Projected Benzene Emissions

Benzene Cancer Risks From Gasoline Station Operation

Modeling Information	
Model:	ISCST3
Sources	Gas Station Emissions
Source Type	Volumes
Number of Sources	8
Receptor Height (m)	1.5 m
Meteorological Data	Concord STP 2001-2005 hourly data
Volume Source Parameters	
Volume Dimensions (L x W x H)	10 m x 10 m x 4 m
Release Height (m)	0 m for spillage and 1 m for refueling

Cancer Risk Calculation Method

Inhalation Dose = C_{air} x DBR x A x HD x EF x ED x 10^{-6} / AT

Where: C_{air} = concentration in air (µg/m^3)
DBR = daily breathing rate (L/kg body weight-day)
A = Inhalation absorption factor
EF = Exposure frequency (days/year)
HD = daily exposure (hours/day/24)
ED = Exposure duration (years)
AT = Averaging time period over which exposure is averaged.
10^{-6} = Conversion factor

Inhalation Dose Factors

	Value[1]							
Exposure Type	**DBR (L/kg BW-day)**	**A (-)**	**Exposure (hr/day)**	**Exposure (days/week)**	**Exposure (week/year)**	**EF (days/yr)**	**ED (Years)**	**AT (days)**
Residential (70-Year)	302	1	24	7	50	350	70	25,550

[1] Default values recommended by Bay Area Air Quality Management District

Cancer Risk (per million) = Inhalation Dose x CRAF x CPF x 10^6
= URF x Cair

Where: CPF = Cancer potency factor (mg/kg-day)$^{-1}$
CRAF = Cancer Risk Adjustment Factor
URF =Unit risk factor (cancer risk per µg/m^3)

Unit Risk Factor for Benzene

Exposure Type	**CPF (mg/kg-day)$^{-1}$**	**CRAF (-)**	**URF *Benzene***
Residential (70-Yr Exposure)	1.00E-01	1.7	49.2

Model Results and Maximum Cancer Risks					
Receptor Type	**1-Hour Concentration (µg/m3)**	**Annual Average Concentration (µg/m3)**	**Benzene Cancer Risk (per million)**	**Acute Benzene Hazard Index**	**Chronic Benzene Hazard Index**
Off-Site Residential (70-year exposure)	1.63	0.00817	**0.40**	**0.0013**	**0.0001**

Reference Exposure Levels (REL)

	Reference Exposure Level (µg/m^3)	
Compound	**Acute (1-hour)**	**Chronic (annual average)**
Benzene	1,300	60

Source: BAAQMD, *Recommended Methods for Screening Local Risks and Hazards* , May 2012

APPENDIX C

Transportation Impact Analysis

Transportation Impact Analysis

Concord Costco Gasoline Expansion

Concord, California

Final Report

May 2015

Transportation Impact Analysis

Concord Costco Gasoline Expansion

Concord, California

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Section 1
Executive Summary

EXECUTIVE SUMMARY

This transportation impact study examines the current transportation network and addresses the environmental effects on future circulation system that would result from the implementation of the proposed Concord Costco gasoline fuel station expansion.

The Concord Costco site is situated on approximately 21.4 acres, roughly one mile south of downtown Concord. The site is located on the southeast quadrant of the Monument Boulevard/Detroit Avenue intersection at 2400 Monument Boulevard, roughly one mile south of the City's central business district. Site accesses are available on Monument Boulevard, Detroit Avenue and Southern Access Road.

The results of this study indicate that the proposed Concord Costco gasoline expansion can be constructed while maintaining acceptable traffic operations and safety at the study intersections in both the year 2014 existing and year 2040 cumulative scenarios.

FINDINGS

Year 2014 Existing Conditions

- Seven study intersections (including site driveways) were selected and agreed upon by the City of Concord for inclusion in the traffic operations analysis.
- All of the study intersections operate at acceptable levels of service during the weekday p.m. and weekend midday peak hours.

Proposed Development Plan

- The proposed gasoline fuel station expansion will include eight new fuel pump stations, increasing capacity 50% from 16 fuel pump stations to 24 fuel pump stations.
- The proposed fuel station expansion is estimated to generate 220 daily net new trips during the weekday and 255 daily net new trips during the weekend.
    - 20 net new trips (10 inbound, 10 outbound) are projected to occur during the weekday p.m. peak hour.
    - 25 net new trips (15 inbound, 10 outbound) are projected to occur during the weekend midday peak hour.

Year 2014 Existing Plus Project Traffic Conditions

- Existing plus project conditions include project-generated traffic from the proposed Concord Costco gasoline fuel station expansion.

- All of the study intersections, and site access points, are forecast to operate with acceptable levels of service during the weekday p.m. and weekend midday peak hours.

Year 2040 Cumulative Traffic Conditions

Cumulative traffic conditions at the study intersections were based on a 0.9-percent annual growth rate applied to the existing traffic volumes. There were two intersections operating below the City of Concord's level of service standards in the cumulative conditions.

- Intersection 2 – Monument Boulevard/Costco Driveway
  - Operates at LOS "E" with an average delay of 47.2 seconds per vehicle and a vehicle-to-capacity ratio of 0.83 during the weekend midday peak hour.
- Intersection 3 – Monument Boulevard/Detroit Avenue
  - Operates at LOS "E" with an average delay of 62.0 seconds per vehicle and a vehicle-to-capacity ratio of 0.87 during the weekday p.m. peak hour.
  - Operates at LOS "F" with an average delay of 81.4 seconds per vehicle and a vehicle-to-capacity ratio of 0.97 during the weekend midday peak hour.

Year 2040 Cumulative Plus Project Traffic Conditions

Cumulative plus project conditions include project-generated traffic from the proposed Concord Costco gasoline fuel station expansion. Project-generated traffic from the proposed gasoline fuel station expansion would be considered a significant impact at an intersection operating below City standard's if average delay increases by three seconds or more. Likewise if any of the intersections operating at acceptable level of service drop below LOS "D", the Project would be considered a significant impact at that location.

- Project-generated traffic does not have a significant impact at any of the study intersections during the weekday p.m. and weekend midday peak hours.
- The effects of project-generated traffic at the intersections affected in the cumulative scenario are described below:
  - Intersection 2 – Operates at LOS "E" during the weekend midday peak hour, project-generated traffic increases delay by 2.9 seconds;
  - Intersection 3 – Operates at LOS "E" during the weekday p.m. peak hour, project-generated traffic increases delay by 0.6 seconds; and
  - Intersection 3 – Operates at LOS "F" during the weekend midday peak hour, project-generated traffic increases delay by 0.3 seconds.

Intersection Queuing Analysis

KAI looked at the impact of the project-generated trips on 95th percentile queue lengths at each study intersection in both existing and cumulative scenarios. The 95th percentile queue would be the expected maximum queue under normal conditions.

- No site driveways exceed their queue storage in the existing, existing plus project, cumulative, or cumulative plus project scenarios.
- Two intersections have 95th percentile queues exceeding their storage length in the existing scenario:
  - Intersection 3 – Monument Boulevard/Detroit Avenue, northbound left queue exceeds storage by 200 feet and 100 feet during the weekend midday and weekday p.m. peak hours, respectively. The eastbound left queue exceeds storage by 175 feet and 150 feet during the weekend midday and weekday p.m. peak hours, respectively.
  - Intersection 7 – Monument Boulevard/Cowell Road, eastbound right queue exceeds storage by 25 feet during the weekday p.m. peak hour and northbound left southbound left queues exceed storage by 25 feet and 35 feet, respectively during the weekday p.m. and weekend midday peak hour.
- Project-generated traffic analyzed in the existing plus project scenario does not increase queue lengths at any of the study in study intersections during the weekday p.m. or weekend midday day peak hours.
- Three intersections have 95th percentile queues exceeding their storage length in the cumulative scenario.
  - Intersection 1 – Monument Boulevard/Oak Grove Road, northbound left queue exceeds storage by 25 feet during the weekend midday day peak hour.
  - Intersection 3 – Monument Boulevard/Detroit Avenue, northbound left queue exceeds storage by 175 feet and 325 feet during the weekday p.m. and weekend midday peak hours, respectively. The eastbound left exceeds queues storage by 300 feet during the weekday p.m. and weekend midday peak hours.
  - Intersection 7 – Monument Boulevard/Cowell Road, eastbound right queues exceed storage by 100 feet and 50 feet during the weekday p.m. peak hour and weekend peak hour respectively. Northbound left and southbound left queues exceed queue storage by 50 feet and 35 feet, respectively during the weekday p.m. and weekend midday peak hour. The westbound left exceeds queue storage by 100 feet during the weekday p.m. peak period.

- Project-generated traffic analyzed in the cumulative plus project scenario does not increase queue lengths at any of the study in study intersections during the weekday p.m. or weekend midday day peak hours.

Fuel Station Access, Circulation, and Queues

- The fuel station is accessible from any of the site driveways; however, the full access intersection at Detroit Avenue is closest to the vehicle queues for the fuel station.
- All gasoline fuel delivery tankers will enter and exit the site at the full access intersection on Detroit Avenue.
  - There is sufficient turning movement area throughout the fuel station and parking zones to accommodate the maneuverability of fuel delivery tankers.
  - Fuel station can remain in operation while fuel delivery occurs.
- With the expansion of the fuel station, fuel station queues are estimated to decrease.
  - 95th percentile queue lengths are estimated to decrease by 35% during the weekday p.m. peak period.
  - 95th percentile queue lengths are estimated to decrease by 13% during the weekend midday peak hour, resulting in queues contained within the fuel station's queuing area.

Section 2
Introduction

INTRODUCTION

Kittelson & Associates, Inc. (KAI) has prepared this transportation impact study that examines the current transportation network and addresses the transportation impacts of the proposed expansion to the existing Costco Gasoline fuel station at the existing Concord Costco development in Concord, California.

PROJECT DESCRIPTION

Costco is proposing to expand the existing Concord Costco gasoline facility to improve the service provided to existing members at this location who currently can experience long queues and wait times during the peak periods. The gasoline fuel station is located on the northern portion of the Costco site with dedicated queuing lanes and storage for vehicles. Figure 1 illustrates the proposed site plan of the Costco Gasoline fuel station expansion.

The existing Concord Costco Gasoline fuel station consists of four islands with a total of sixteen vehicle fueling positions. Costco is proposing to expand the fuel station by adding four additional fueling dispensers (with two fueling positions each). The four additional dispensers will provide eight new fueling positions for a new total of twenty-four vehicle fueling positions, increasing capacity of the fuel station by 50%. KAI collected data from the current 16-position facility and analyzed this data, along with data from other Costco Gasoline expansions, to estimate impacts of expanding the fuel station to 24-positions.

PROJECT LOCATION

The existing Concord Costco development is located at 2400 Monument Boulevard in Concord, California. The site is located on the south side of Monument Boulevard, bordered by Detroit Avenue to the east. The site is designated in a regional commercial zone as in not within the boundaries of Concord's Central Business District[1] as outlined in the *City of Concord's 2030 General Plan*[2] (Reference 1).

[1] The Central Business District is generally defined as the area bound by Concord Avenue and Salvio Street to the north; Willow Pass Road, Clayton Road and Galidno Street to the south; Port Chicago Highway, Oakland Avenue and Mesa Street to the east; and Interstate 680 to the west.

[2] City of Concord. *Concord 2030 General Plan:* Volume I: Plan Policies, Concord, California, 2012.

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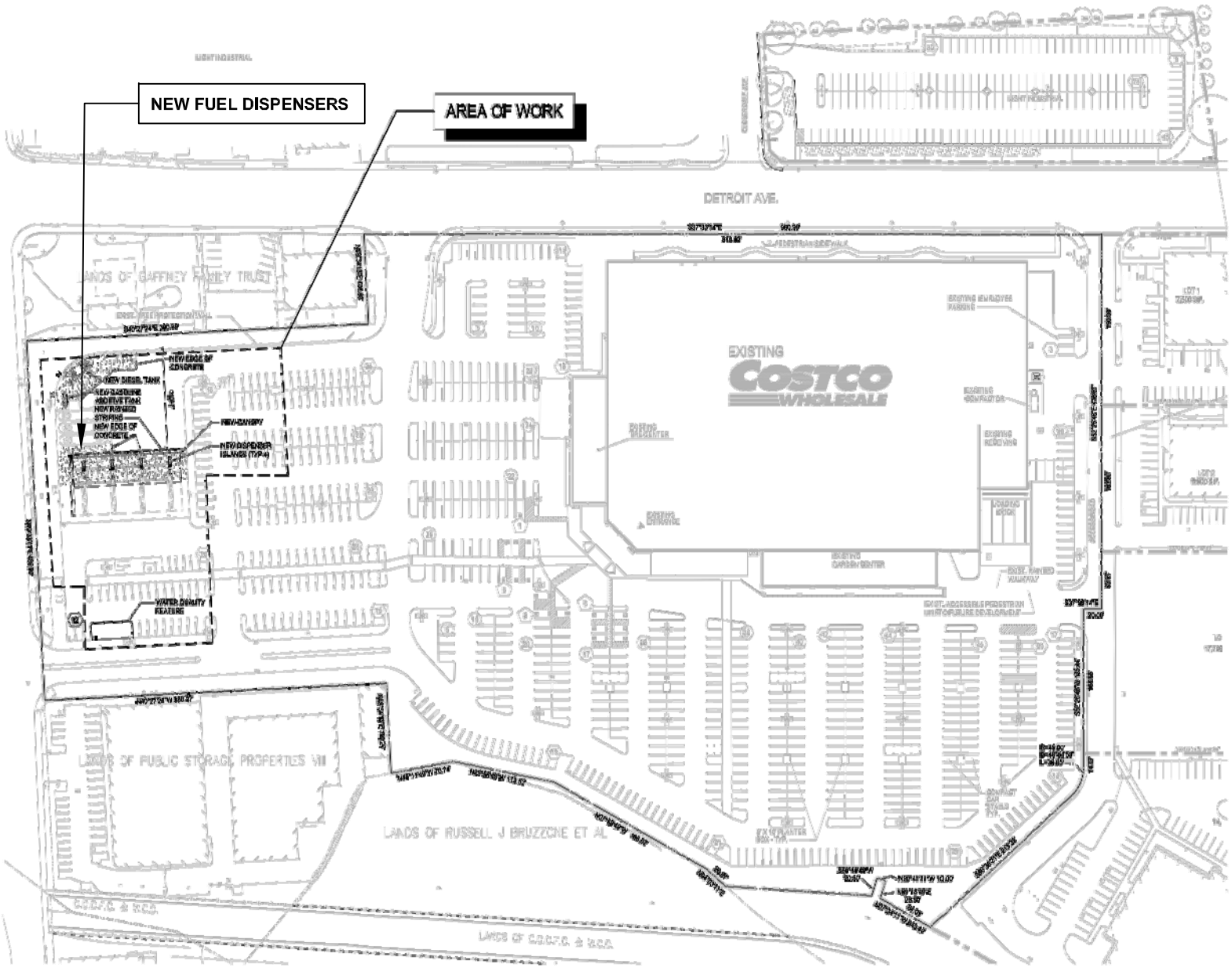


Proposed Concord Costco Gasoline Expansion Site Plan
Concord, California

FIGURE 1

SITE ACCESS

There are three existing driveways accessing the Concord Costco site. A right-in/right-out access is available on the north side of the site with access to and from Monument Boulevard in the eastbound direction. There is a full access driveway located on the northeast side of the site which includes a signalized full movement access to and from Detroit Avenue. A third access driveway is accessible on the southern boundary of the site from the southern access road via Detroit Avenue.

TRIP GENERATION CHARACTERISTICS

Before and after data from comparable Costco Gasoline fueling station expansion sites was reviewed to determine a representative relationship between new trip generation and the addition of fueling positions to the existing station.

The proposed fuel station expansion is estimated to generate 220 daily net new weekday trips and 255 daily net new weekend trips. Twenty net new trips (10 inbound, 10 outbound) are projected to occur during the weekday p.m. peak hour, and 25 net new trips (15 inbound, 10 outbound) are projected to occur during the weekend midday peak hour.

SCOPE OF THE REPORT

This report evaluates the following transportation issues:

- Existing land-use and transportation-system conditions within the site vicinity during the weekday p.m. and weekend midday peak periods;
- Trip generation and distribution estimates for the proposed Concord Costco Gasoline fuel station expansion;
- Existing plus project (with build-out of the project) traffic conditions during the weekday p.m. and weekend midday peak periods;
- Forecast year 2040 cumulative traffic conditions during the weekday p.m. and weekend midday peak periods;
- Forecast year 2040 cumulative plus project traffic conditions during the weekday p.m. and weekend midday peak periods;
- A queuing analysis at each of the study intersections during the weekend p.m. and weekend midday peak period under existing, existing plus project, as well as cumulative and cumulative plus project traffic conditions;
- Existing parking supply and demand at the Costco site and the impact of the proposed fuel station expansion on parking supply;
- Fuel station access, circulation, and queuing; and
- Conclusions and findings.

Section 3
Existing Conditions

EXISTING CONDITIONS

The existing conditions analysis identifies the site conditions and current operational and geometric characteristics of the roadways within the study area. These conditions will be compared with future conditions and with-project conditions later in this report.

KAI staff visited and inventoried the Concord Costco development site and surrounding study area in October 2014. At that time, KAI collected information regarding site conditions, adjacent land uses, and transportation facilities in the study area. Existing traffic counts at each of the study intersections were collected in mid-November 2014.

SITE CONDITIONS AND ADJACENT LAND USES

The site is located roughly one mile south of the City's Central Business District. The land uses in the vicinity of the site are regional and service commercial with medium and low density residential land uses north of Monument Boulevard. Monument Boulevard provides an east/west connection from Interstate 680 to the west of the site and to downtown Concord to the east of the site. Figure 2 illustrates key transportation facilities and study intersections within the study vicinity.

TRANSPORTATION FACILITIES

Existing transportation facilities and roadways in the study area are summarized in Table 1.

Table 1. Existing Study Transportation Facilities and Roadways

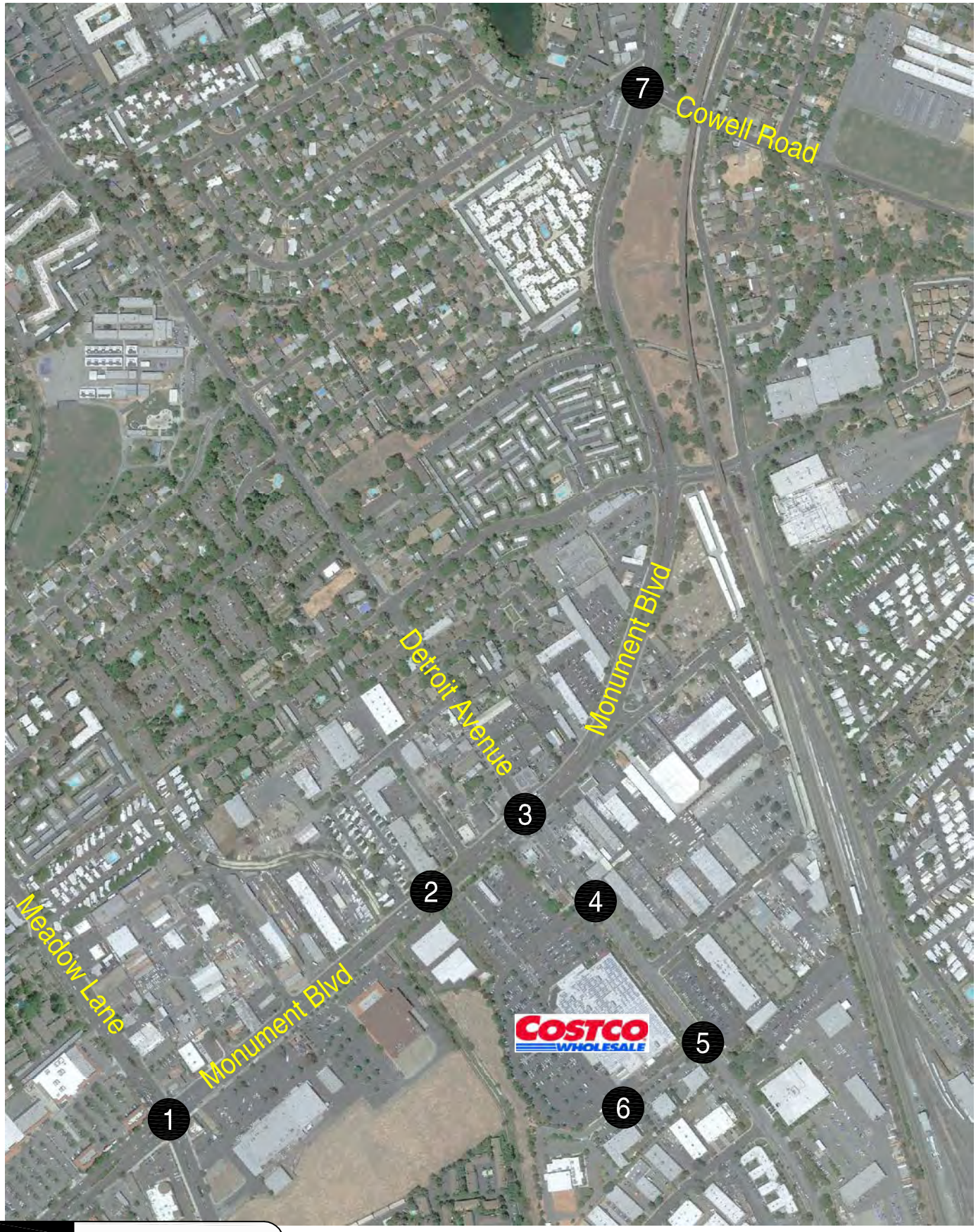
Roadway	Complete Street Type Description[1]	Number of Lanes	Posted Speed (mph[2])	Sidewalks	Bicycle Lanes	On-Street Parking
Monument Boulevard	Community	4-6 Lanes	35	Yes	No	No
Oak Grove Road	Community	4 Lanes	35	Yes	No	No
Meadow Lane	Community	2-4 Lanes	35	Yes	Yes	Yes
Detroit Avenue	Neighborhood/Service	2-4 Lanes	35	Partial[3]	No	Partial[4]
Cowell Road	Neighborhood	2 Lanes	35	Partial6	No[5]	Partial[6]

Notes: [1] Per City of Concord 2030 General Plan, Table 5.1; [2] mph represents miles per hour; [3] Sidewalks are not provided on the west side of Detroit Avenue, north of Monument Blvd; [4] On-street parking available on both sides of the road north of Monument Blvd; [5] Designated as a bike route; [6] Intermittent sidewalks along east side of Cowell Road.

Roadway Facilities

The roadway network in the study area is comprised of an extensive street system made up of arterial, collector, and local roads. The roadway facilities within the study area are described below:

Monument Boulevard provides an east/west connection from Interstate 680 to Concord's Central Business District where it continues as Galindo Road north of the Cowell Road intersection.



LEGEND

● - STUDY INTERSECTIONS

Site Vicinity
Concord, California

FIGURE **2**

KITTELSON & ASSOCIATES, INC.
TRANSPORTATION ENGINEERING / PLANNING

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Monument Boulevard ranges from 4-6 lanes along the corridor, with six lanes within the vicinity of the Concord Costco site. The posted speed limit is 35 mph. The roadway does not allow parking on either side of the street and does not include bike lanes. County Connection bus lines 14 and 16 run along Monument Boulevard and sidewalks are present on both sides of the roadway.

Oak Grove Road is a four lane roadway running north/south on the west side of the City's boundaries. Oak Grove Road is classified as a community road and provides access to neighborhoods in southwest Concord and Walnut Creek. Within the vicinity of the site the roadway has a posted speed limit of 35 mph with sidewalks on both sides of the road. Bike lanes are not present and parking is prohibited. Oak Grove Road continues on as Meadow Lane north of Monument Boulevard.

Meadow Lane continues in a north/south direction north of Monument Boulevard for roughly one mile before continuing on as Market Street running parallel along CA 242. Meadow lane is two lanes for the length of the roadway before widening to four lanes in the vicinity of the Monument Boulevard intersection. The roadway includes parking on both sides of the street as well as sidewalks and Class II bike lanes in both directions.

Detroit Avenue provides north/south access from Clayton Road in the north to Chalomar Road in the south. Between Monument Boulevard and Clayton Road, Detroit Avenue provides access to low and medium density residential neighborhoods. There are no bike lanes north of Monument, and intermittent sidewalks on both sides of the street. Parking is allowed on both either sides of the roadway. South of Monument Boulevard, Detroit Avenue is four lanes with a center turn lane. There are no bike lanes and parking is prohibited on both sides of the street. A two-way center turn lane allows access to development on both sides of the roadway. There are sidewalks on both sides of Detroit Avenue within the vicinity of the Costco site.

Cowell Road is located east of the project site and runs parallel to Clayton Road. The roadway consists of one lane in each direction. There are no bike lanes present; however, Cowell Road is designated as a Class 3B bike route. Parking is prohibited on both sides of the street and sidewalks are intermittent along the east side of the roadway.

TRANSIT FACILITIES

The Concord Costco site is accessible via County Connection bus lines 14 and 16. Both bus lines have designated stops on Monument Boulevard at the Monument Boulevard/Detroit Avenue intersection. Bus line 14 runs east/west from the Concord BART station to the Pleasant Hill BART station, with multiple stops along Monument Boulevard. Headways range from 20-40 minutes throughout the weekday and weekends. Bus line 16 runs from Concord BART station to the Martinez Amtrak station with 40 minute headways during weekdays and weekends.

Both bus lines provide access to BART (Bay Area Rapid Transit) which provides regional access around the Bay Area. The Concord BART station is the closest BART station to the site roughly 1 mile northeast along Monument Boulevard/Galindo Street. Concord BART is along the Pittsburg Bay Point line which

runs seven days a week from Pittsburg to San Francisco International Airport and onto Millbrae during peak commute hours and on weekends.

STUDY INTERSECTIONS

This analysis determines the transportation-related impacts associated with the proposed Costco Gasoline fuel station expansion and was prepared in accordance with the City of Concord's requirements for traffic impact analyses. The study intersections of this project were selected based on direction from City of Concord Staff. Figure 3 illustrates the lane configuration and traffic control device at each of the study intersections. Operational analyses were performed at following study intersections:

1. Monument Boulevard/Oak Grove Road/Meadow Lane
2. Monument Boulevard/Costco Driveway
3. Monument Boulevard/Detroit Avenue
4. Detroit Avenue/N Costco Driveway
5. Detroit Avenue/Southern Access Road
6. Southern Access Road/S Costco Driveway
7. Monument Boulevard/Cowell Road

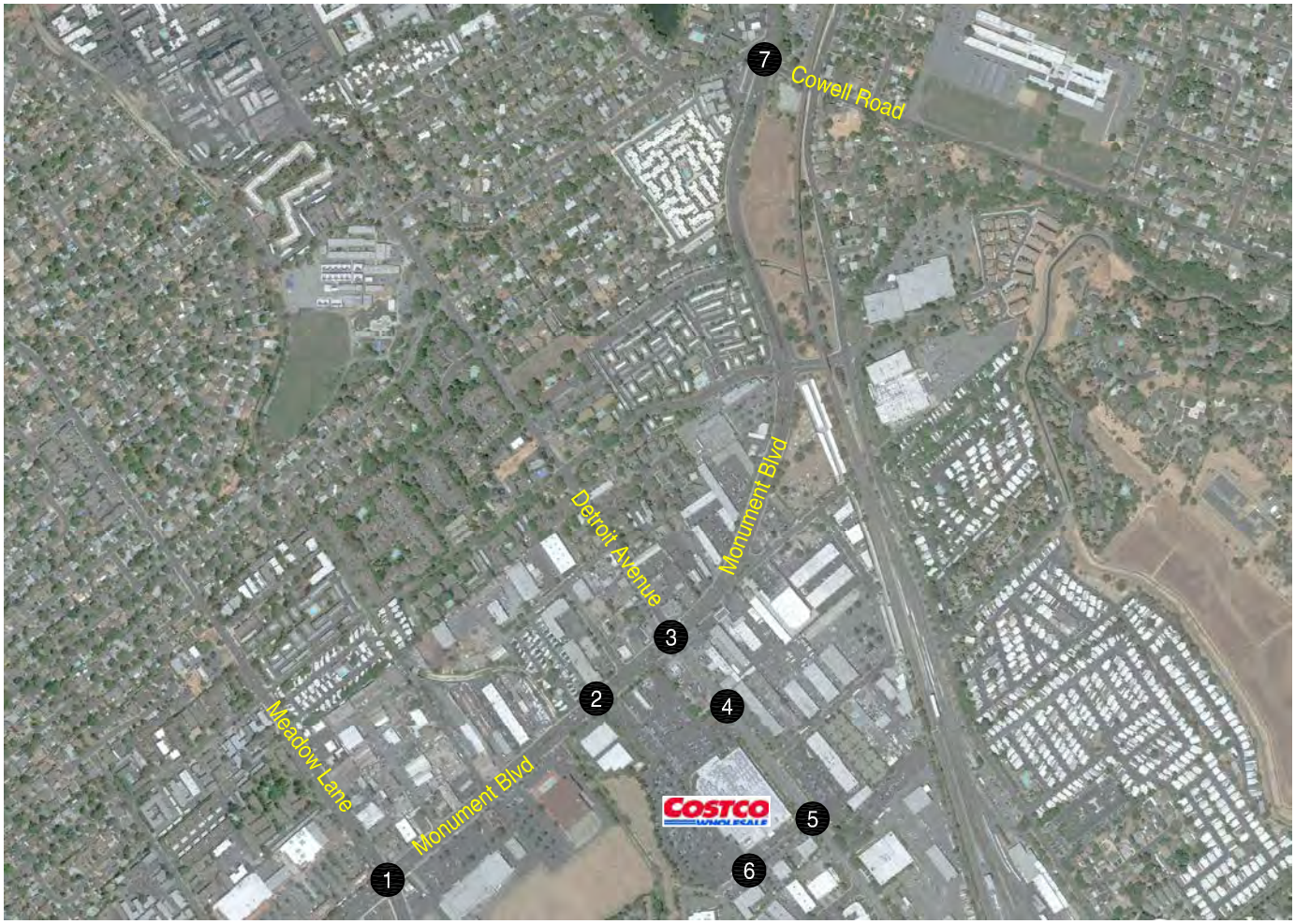
EXISTING PEAK HOUR TRAFFIC OPERATIONS

Intersection turning movement counts were collected on a typical midweek day afternoon (PM) peak commute period and weekend midday day (MID) peak period in November 2014. The PM peak commute period generally occurs between 4:00 p.m. and 6:00 p.m. However, to capture the highest one-hour volumes during the peak PM period, counts were collected from 3:30 p.m. to 6:30 p.m. at each study intersection on Wednesday, November 12, 2014. To capture the weekend midday peak hour, counts were collected between 12:00 p.m. and 3:00 p.m. on Saturday, November 8, 2014. The system-wide weekday p.m. and weekend midday peak hours were found to occur between 5:00 p.m. and 6:00 p.m. and 1:05 p.m. and 2:05 p.m., respectively.

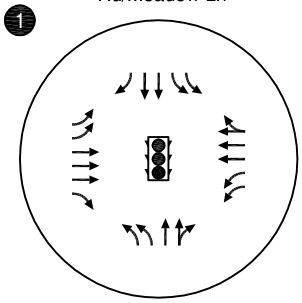
Current Levels of Service

All level of service analyses described in this report were performed in accordance with the procedures stated in the *2000 Highway Capacity Manual*[3] (Reference 2) as required by the *City of Concord's 2030 General Plan*. *A description of level of service and its criteria is presented in Appendix "A".*

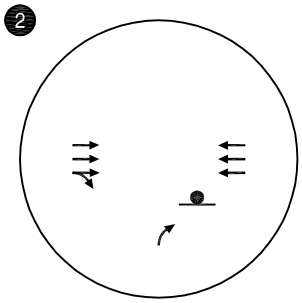
[3] Transportation Research Board. *Highway Capacity Manual*, Washington, D.C., 2000.



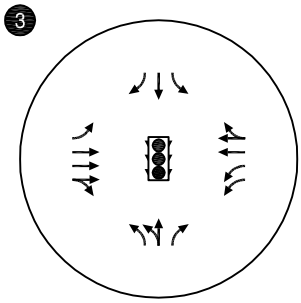
Monument Blvd/Oak Grove Rd/Meadow Ln



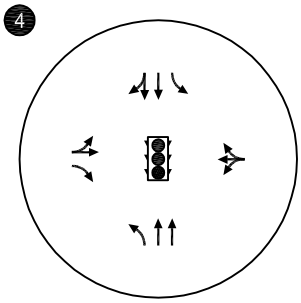
Monument Blvd/Costco Dwy



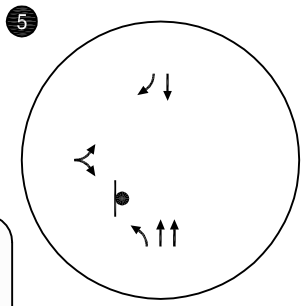
Monument Blvd/Detroit Avenue



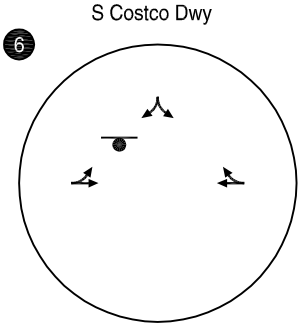
Detroit Ave/N Costco Dwy



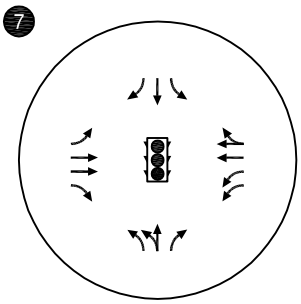
Detroit Avenue/ Southern Access Road



Southern Access Road/ S Costco Dwy



Monument Blvd/Cowell Road



Note: Monument Boulevard is modeled as the eastbound/westbound roadway for applicable study intersections.

LEGEND

- STOP SIGN
- TRAFFIC SIGNAL

Study Intersections and Lane Configurations
Concord, California

FIGURE 3

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Appendix "A" also indicates how level of service is measured and what is generally considered the acceptable range of level of service. Intersection level of service (LOS) is analogous to the letter grades in a school report card. Motorists using an intersection that operates at LOS "A" experience very little delay, while those using an intersection that operates at LOS "F" will experience what most would consider unacceptably long delays.

The City of Concord has adopted level of service standards for signalized and unsignalized intersections. Based on *Concord's General Plan*, LOS "D" or better is considered acceptable at a signalized intersection outside of the Central Business District. A critical movement volume-to-capacity ratio of 0.90 or less and an LOS "E" or better are typically considered acceptable at an unsignalized intersection.

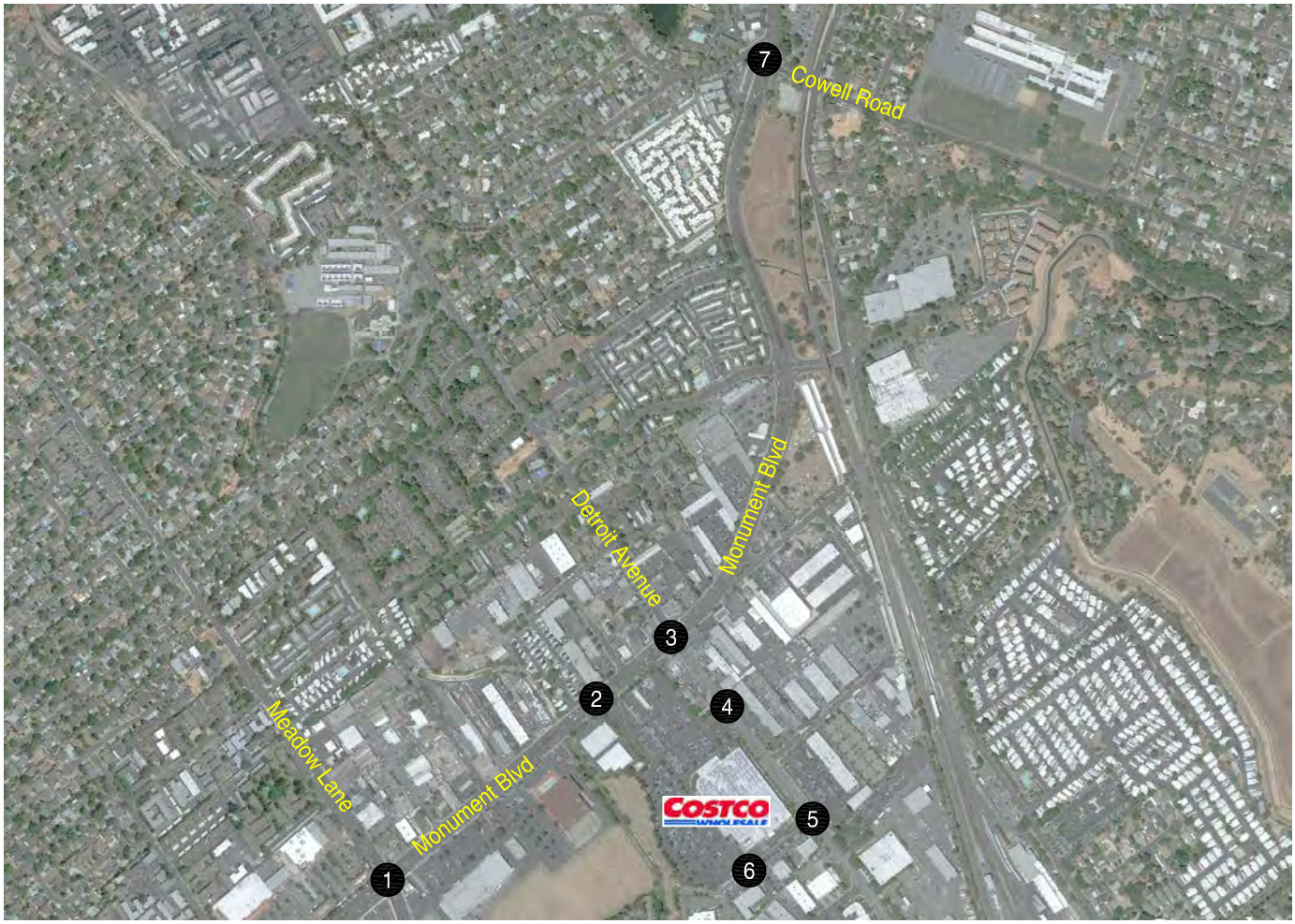
The existing intersection level of service evaluation used the peak 15-minute flow rate during the weekday p.m. and weekend midday peak hours. Using the peak 15-minute flow rate ensures that this analysis is based on a reasonable worst-case scenario. For this reason, the analysis reflects conditions that are only likely to occur for 15 minutes out of each average peak hour. The transportation system will likely operate under conditions better than those described in this report during all other time periods.

Figure 4 and Figure 5 provide the intersection turning movement counts and summarize the intersection level of service results for the weekday p.m. and weekend midday peak hour existing traffic conditions. Table 2 also summarizes the existing conditions intersection operations. As shown in the figures and in Table 2, all of the study intersections operate at acceptable levels of service during the existing conditions weekday p.m. and weekend midday peak hours. *Appendix "B" includes the level of service worksheets for the existing traffic conditions scenarios.*

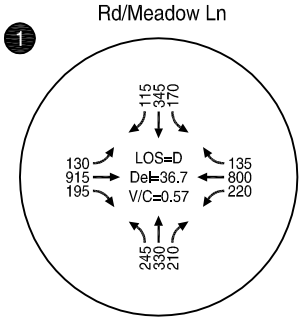
Table 2. Existing Peak Hour Traffic Operations

Study Intersection	Peak Period	Existing Traffic Operations		
		LOS[1]	Delay[2]	V/C Ratio[3]
1. Monument Blvd/Oak Grove Rd	PM Peak	D	36.7	0.57
	MID Peak	C	33.8	0.59
2. Monument Blvd/Costco Dwy	PM Peak	C	19.8	0.44
	MID Peak	C	24.9	0.61
3. Monument Blvd/Detroit Ave	PM Peak	D	48.8	0.74
	MID Peak	D	47.6	0.81
4. Detroit Ave/N Costco Dwy	PM Peak	B	17.6	0.57
	MID Peak	C	21.7	0.63
5. Detroit Ave/Southern Access Rd	PM Peak	C	15.3	0.35
	MID Peak	C	15.9	0.44
6. Southern Access Dr/S Costco Dwy	PM Peak	A	9.8	0.19
	MID Peak	B	10.8	0.32
7. Monument Blvd/Cowell Rd	PM Peak	C	33.0	0.66
	MID Peak	C	30.7	0.54

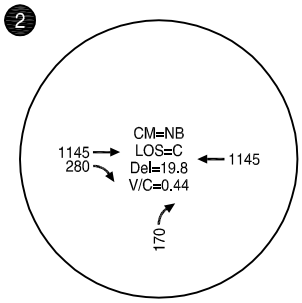
Notes: [1] LOS = Level of Service; [2] Delay is reported in seconds per vehicle; [3] V/C Ratio is defined as vehicle-to-capacity ratio which calculates the number of vehicles divided by the capacity of the roadway/intersection during the peak 15 minutes of the peak hour.



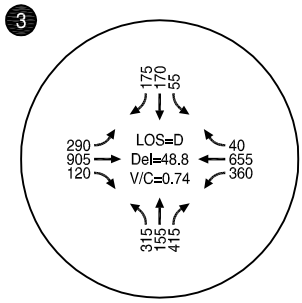
Monument Blvd/Oak Grove Rd/Meadow Ln



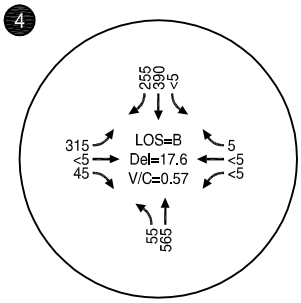
Monument Blvd/Costco Dwy



Monument Blvd/Detroit Avenue

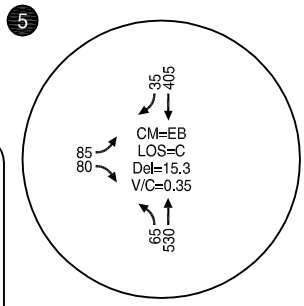


Detroit Avenue/N Costco Dwy

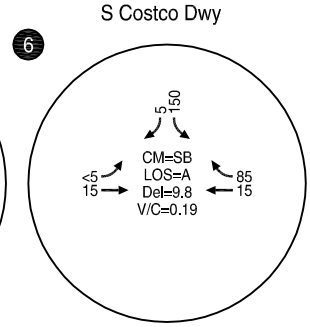


Note: Monument Boulevard is modeled as the eastbound/westbound roadway for applicable study intersections.

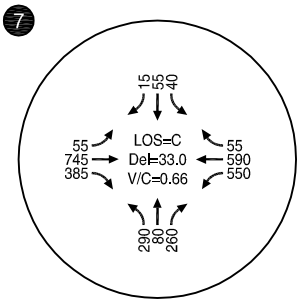
Detroit Avenue/ Southern Access Road



Southern Access Road/ S Costco Dwy



Monument Blvd/Cowell Road



LEGEND

CM = CRITICAL MOVEMENT (UNSIGNALIZED)

LOS = INTERSECTION LEVEL OF SERVICE (SIGNALIZED)/CRITICAL MOVEMENT LEVEL OF SERVICE (UNSIGNALIZED)

Del = INTERSECTION AVERAGE CONTROL DELAY (SIGNALIZED)/CRITICAL MOVEMENT CONTROL DELAY (UNSIGNALIZED)

V/C = CRITICAL VOLUME-TO-CAPACITY RATIO

Existing
Weekday PM Peak Hour Traffic Conditions
Concord, California

FIGURE **4**

KITTELSON & ASSOCIATES, INC.
TRANSPORTATION ENGINEERING / PLANNING

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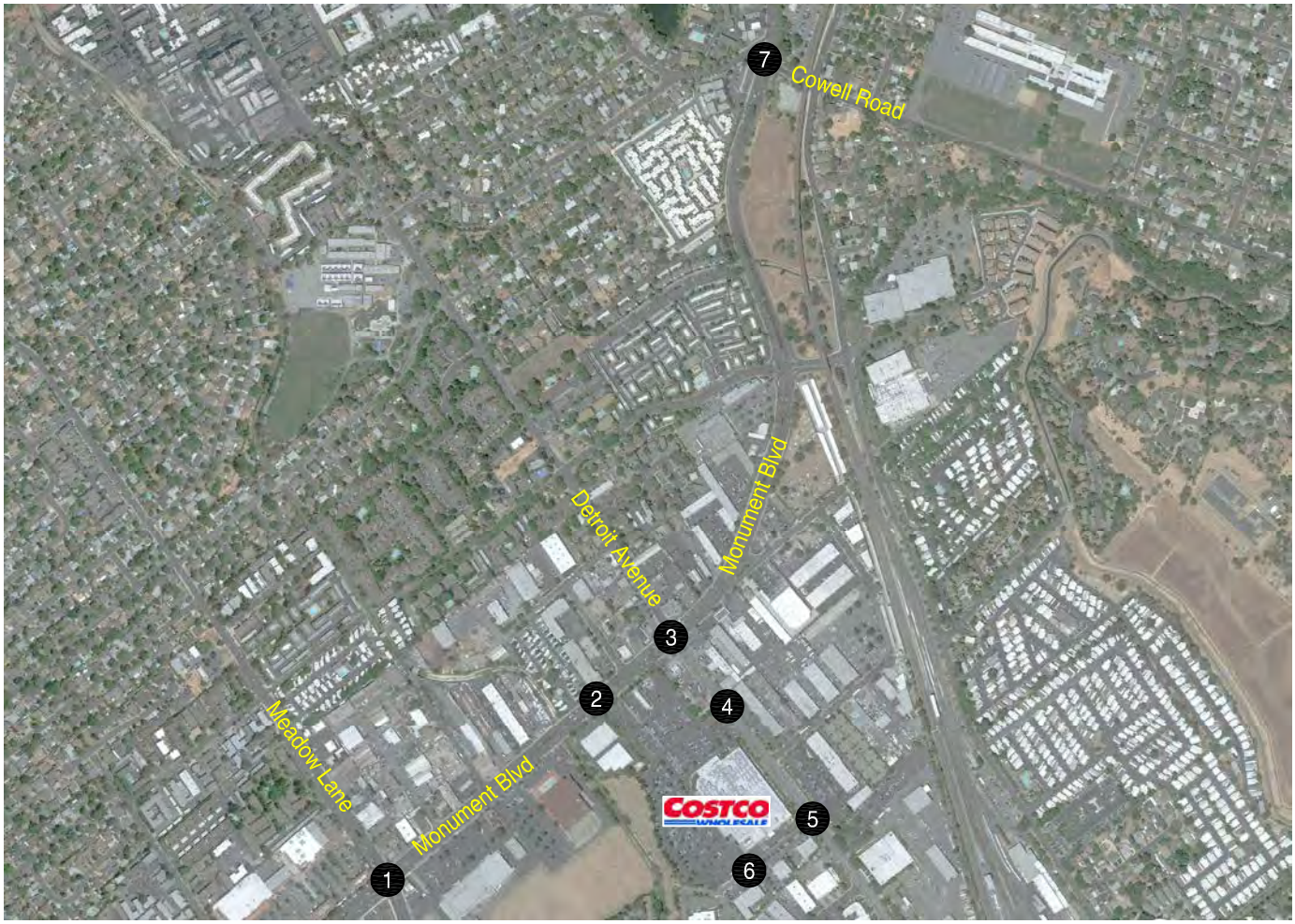
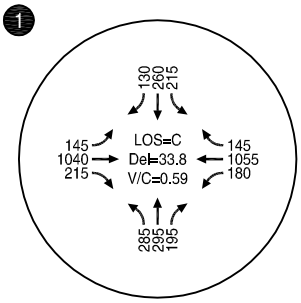


Monument Blvd/Oak Grove Rd/Meadow Ln

1



Monument Blvd/Costco Dwy

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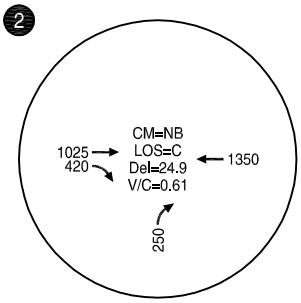
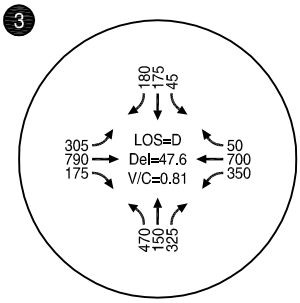


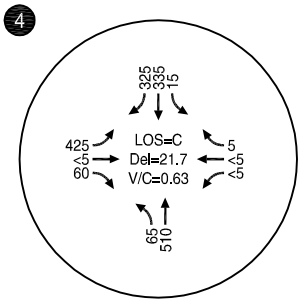
Monument Blvd/Detroit Avenue

3



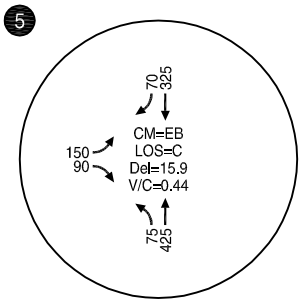
Detroit Avenue/N Costco Dwy

4



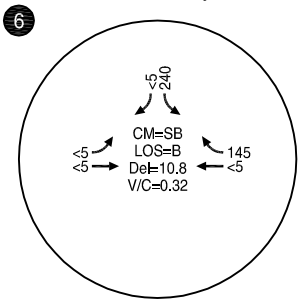
Detroit Avenue/ Southern Access Road

5



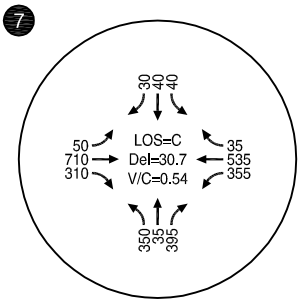
Southern Access Road/ S Costco Dwy

6



Monument Blvd/Cowell Road

7



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V/C = CRITICAL VOLUME-TO-CAPACITY RATIO

Existing
Weekend Midday Peak Hour Traffic Conditions
Concord, California

FIGURE **5**

KITTELSON & ASSOCIATES, INC.
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Section 4
Transportation Impact Analysis

TRANSPORTATION IMPACT ANALYSIS

The transportation impact analysis identifies how the study area's transportation system will operate under near-term and in long-term cumulative conditions with the proposed fuel station expansion built-out. The impact of traffic generated by the proposed Costco Gasoline fuel station expansion during the typical weekday p.m. and weekend midday peak hours was examined as follows:

- Project-generated trips were estimated for build-out of the project;
- Project trip-distribution patterns were derived after the existing traffic patterns and the major trip origins and destinations in the Concord area were evaluated;
- Existing and cumulative year 2040 conditions were analyzed with the addition of project-generated traffic at each of the study intersections and site-access points during the weekday p.m. and weekend midday peak hours;
- Queuing analysis was completed at each of the study intersections for existing, existing plus project, cumulative and cumulative plus project scenarios;
- Existing on-site parking supply and demand was evaluated and impacts to parking based on the proposed fuel station expansion were identified; and
- Fuel station access, queuing, and on-site circulation were evaluated.

TRIP GENERATION

In developing a trip generation estimate for fuel station expansion, it is important to recognize that the fuel station exists on site today and the proposed project is an expansion to this existing use, not the addition of a new use. Furthermore, the market area of the Concord Costco is already defined through existing membership and operations. As such, it's unlikely that trip generation of the fuel station will increase directly in proportion to the increased number of fueling positions. More likely is that the additional fueling positions will serve to more efficiently and effectively process the current peak demand at the fuel station, thus reducing wait times, vehicle queuing, and vehicle idling.

Although the standard reference manual ITE *Trip Generation* currently reports trip generation for gasoline stations based on the independent variable of fueling positions, more recent transportation studies indicate that other variables besides the specific number of fueling pumps have a much larger influence on trip generation. As such, the profession is moving towards modifying this for the gasoline station land use codes and working on studies that include different independent variables. An ITE paper was published in the June 2011 *ITE Journal* documenting a study completed by North Carolina State University confirming these methodologies.

To confirm this approach, before and after data from comparable Costco Gasoline fuel station expansion sites was reviewed to determine a more representative relationship between new trip generation and the addition of fueling positions to the existing station.

Before & After Fuel Expansion Data Summary

KAI worked with Costco to identify eight Costco Gasoline locations that have expanded in size. There are several examples where Costco Gasoline fuel stations had been expanded from three islands (12 fueling positions) to four islands (16 fueling positions), one example of expanding from 16 to 20 positions, and one example of expanding from 12 to 20 positions. This also includes the Concord California site when it was previously expanded from 12 to 16 fueling positions. The comparable expansion sites identified were:

- Salem, Oregon
- Kona, Hawaii
- Orem, Utah
- Vancouver, Washington
- Concord, California
- Folsom, California
- Waipio, Hawaii
- Issaquah, Washington

In order to work with a representative sample size, Costco provided fuel transaction data collected on an hourly basis for a period before and after the expansion at each of these locations. Only data that was collected during similar months of the year prior to and after the expansion was included in this summary (for example, fuel transactions for the months of October and November before the expansion were compared to fuel transactions for the months of October and November after the expansion). The results of this before and after comparison for the eight listed sites are provided in Table 3.

Table 3. Average Weekday Fuel Transactions Before & After Data Summary

Location	Average Weekday Daily Fuel Transactions		
	Before Expansion	After Expansion	% Difference
Salem, OR	1,911	2,223	16.3%
Kona, HI	2,336	2,406	3.0%
Orem, UT	2,239	2,390	6.7%
Concord, CA	2,502	2,578	3.0%
Folsom, CA	2,370	2,593	9.4%
Vancouver, WA	2,370	2,709	14.3%
Waipio, HI[1]	3,941	4,258	8.0%
Issaquah, WA[2]	2,800	3,150	12.5%
Average			**9.2%**

Notes: [1] Expansion from 16 fueling positions to 20 fueling positions; [2] Expansion from 12 fueling positions to 20 fueling positions; All other examples are expansions from 12 to 16 fueling positions.

As shown in Table 3, each of the eight sites recorded an increase in the number of average weekday daily fuel transactions. However, the increase found in all situations is significantly less than what would be calculated from a direct linear relationship to the number of vehicle fueling positions. Using a linear relationship, expanding the fuel station from 12 to 16 fueling positions would equate to an increase in activity or trip generation of 33%, expanding from 12 to 20 positions would equate to an increase of 67%, and expanding from 16 to 24 would equate to an increase of 50%. However, the actual before and after data shows an average increase of 9.2% in daily fuel transactions.

This data demonstrates that increasing the number of fueling positions at the Concord Costco Gasoline facility will not result in a direct linear increase in trip generation. The before and after data captures the change in demand that results from reducing peak hour queues and wait times at the fuel stations due to the effect of latent demand and more efficient peak operations. In all cases, peak queues and wait times are significantly reduced and those members who previously chose not to purchase fuel because of the wait times will likely do so in either case once the operations are improved.

Fuel Station Expansion Trip Generation Estimate

Under existing conditions, the Concord Costco Gasoline facility generates 470 trip ends (or 235 vehicles) during the weekday p.m. peak hour and 520 trip ends (or 260 vehicles) during the weekend midday peak hour. Applying the data from Table 3 and the observed increase in activity from Costco Gasoline expansion sites to the existing trip generation, Table 4 and Table 5 provide an estimate of the expected number of additional trips that will result from the proposed expansion to the Concord Costco Gasoline facility. Applying the determined 9.2% increase in activity due to the proposed expansion, the new total trip generation estimate for the weekday p.m. peak hour is summarized in Table 4.

Table 4. Concord Costco Gasoline Expansion Trip Generation Estimate – PM Peak Hour

	Concord Costco Existing Trips (16 fueling positions)[1]			Estimated Trips due to Fuel Station Expansion[2]			Total PM Estimated Trips w/Fuel Station Expansion (24 fueling positions)		
Trip Generation	**In**	**Out**	**Total**	**In**	**Out**	**Total**	**In**	**Out**	**Total**
Total Trips	235	235	470	25	20	45	260	255	515
Internal Trips (34%)	*(80)*	*(80)*	*(160)*	*(10)*	*(5)*	*(15)*	*(90)*	*(85)*	*(175)*
External Trips	155	155	310	15	15	30	170	170	340
Pass-by Trips (37%)[3]	*(55)*	*(55)*	*(110)*	*(5)*	*(5)*	*(10)*	*(60)*	*(60)*	*(120)*
Net New Trips[4]	**100**	**100**	**200**	**10**	**10**	**20**	**110**	**110**	**220**

Notes: [1] Traffic counts obtained at the existing Concord Costco Gasoline fuel station in November 2014; [2] Estimated trips based on before and after data from similar Costco gasoline expansion locations; [3] Note pass-by trip percentage is percentage of external trips; [4] Member surveys at existing Costco fuel stations indicate that only approximately 18% of the total existing fuel station trips are "net new" trips on the surrounding transportation system whose primary purpose is to visit the Costco fuel station. The remaining 72% of the trips are shared internal trips with the Costco warehouse or pass-by and diverted trips from the neighboring roadways; as a conservative measure, trip generation estimates were rounded to the next fifth vehicle.

As seen from Table 4, the additional fueling positions are estimated to generate approximately 45 additional weekday p.m. peak hour total trip ends. However, only approximately 20 of these trip ends (or 10 vehicles) will be net new trips of the surrounding transportation system.

Under existing conditions, the Concord Costco Gasoline facility generates 520 trip ends (or 260 vehicles) during the weekend midday peak hour. By applying the 9.2% increase in the activity due to the proposed expansion, the weekend midday peak hour is estimated to generate approximately 50 additional trips ends. However, only approximately 25 of these trip ends will be net new trips. Table 5 summarizes the estimated trip generation due to the proposed expansion.

Table 5. Concord Costco Gasoline Expansion Trip Generation Estimate – Midday Peak Hour

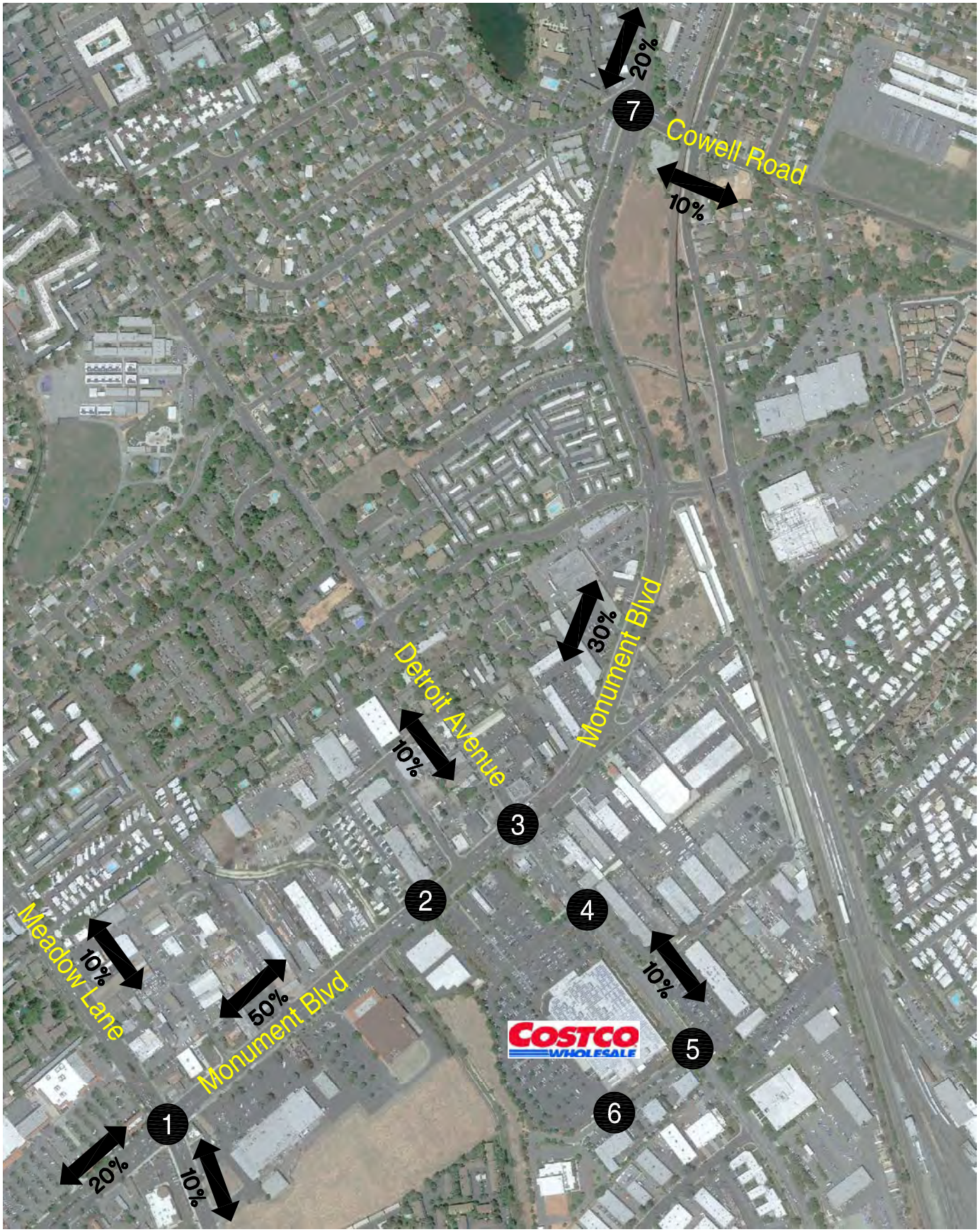
Weekend Midday Peak Hour	Actual Concord Existing Trips (16 fueling positions)			Estimated Trips w/Fuel Station Expansion (24 fueling positions)			Total Estimated Trips w/Fuel Station Expansion (24 fueling positions		
	In	Out	Total	In	Out	Total	In	Out	Total
Total Trips	260	260	520	25	25	50	285	285	570
Internal Trips (35%)	*(90)*	*(90)*	*(180)*	*(5)*	*(10)*	*(15)*	*(95)*	*(100)*	*(195)*
External Trips	170	170	340	20	15	35	190	185	375
Pass-by Trips (33%)	*(55)*	*(55)*	*(110)*	*(5)*	*(5)*	*(10)*	*(60)*	*(60)*	*(120)*
Net New Trips	**115**	**115**	**230**	**15**	**10**	**25**	**130**	**125**	**255**

Notes: [1] Traffic counts obtained at the existing Concord Costco Gasoline fuel station in November 2014; [2] Estimated trips based on before and after data from similar Costco gasoline expansion locations; [3] Note pass-by trip percentage is percentage of external trips; [4] Member surveys at existing Costco fuel stations indicate that only approximately 18% of the total existing fuel station trips are "net new" trips on the surrounding transportation system whose primary purpose is to visit the Costco fuel station. The remaining 72% of the trips are shared internal trips with the Costco warehouse or pass-by and diverted trips from the neighboring roadways; as a conservative measure, trip generation estimates were rounded to the next fifth vehicle.

TRIP DISTRIBUTION AND ASSIGNMENT

Trip distribution patterns were derived from the existing traffic patterns and major trip origins and destinations within the study area. Traffic counts verified that roughly half of the site generated trips access the site via Monument Boulevard west of Detroit Avenue. From the west, Monument Boulevard provides connections to Interstate 680. To the east, Monument Boulevard provides connection to downtown Concord and its central business district, of which roughly 30 percent site generated traffic is distributed east of Detroit Avenue. Roughly 20 percent of project-generated is distributed north/south along Detroit Avenue, providing connections local neighborhoods to the north of Monument Boulevard and commercial development and local neighborhoods south of Monument Boulevard. Figure 6 illustrates the estimated trip distribution pattern for the proposed development.

The estimated project-generated trips were assigned to the network by distributing the trips shown in Table 4 and Table 5 according to the trip distribution pattern shown in Figure 6. Figure 7 and Figure 8 illustrate the project-generated trips that are expected to use the roadway system during the weekday p.m. and weekend midday peak hours, respectively.



Project-Generated Trip Distribution Concord, California

FIGURE 6

KITTELSON & ASSOCIATES, INC.
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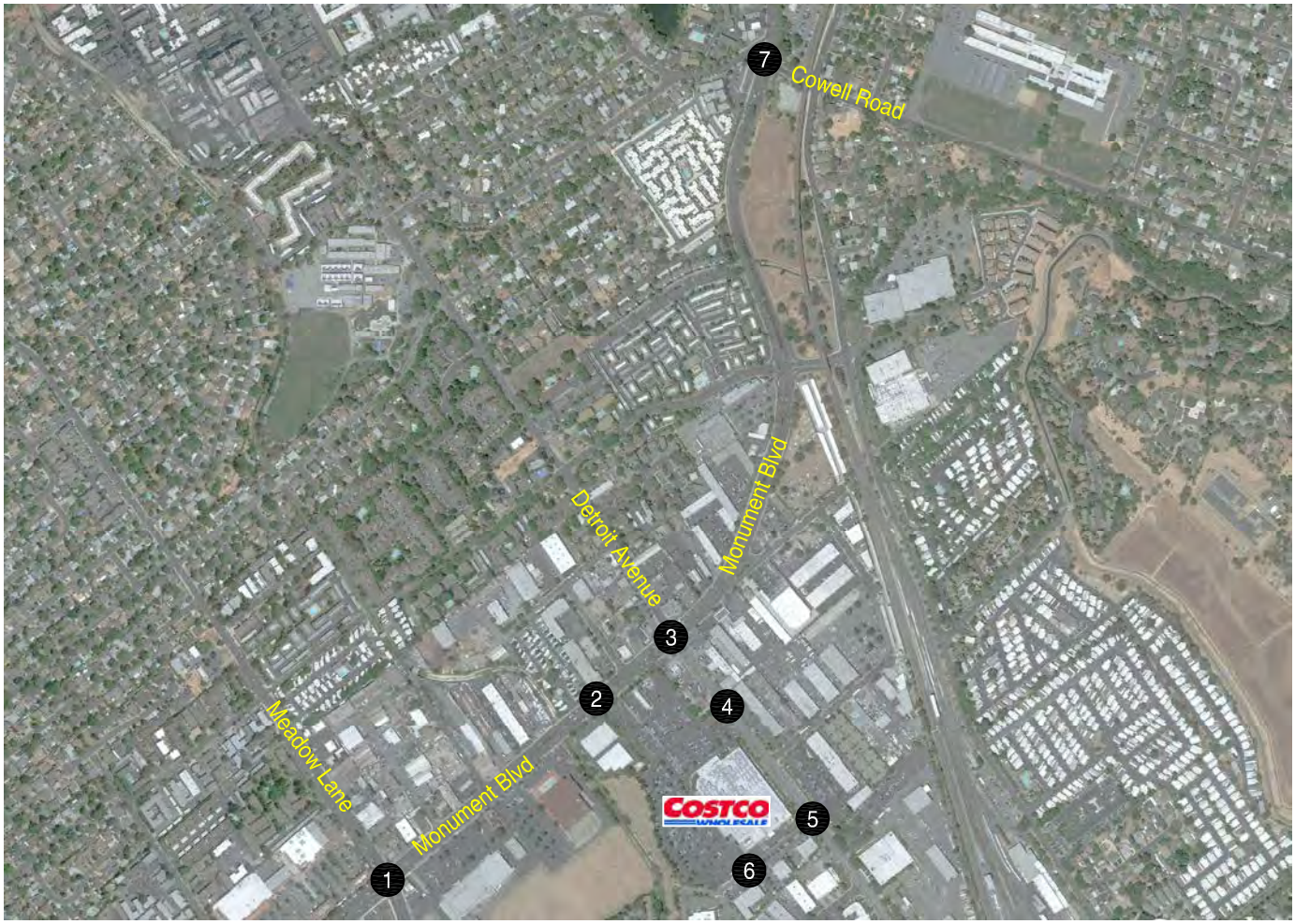

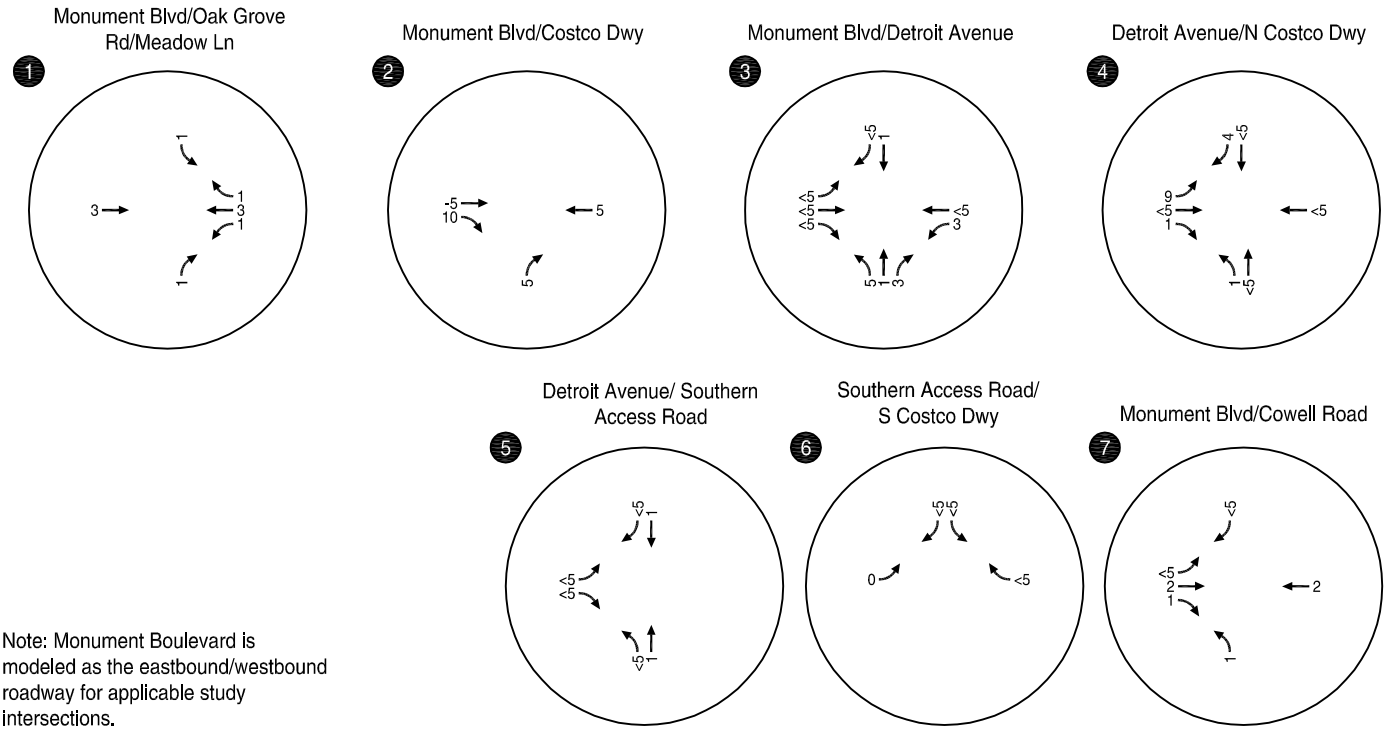

Note: Monument Boulevard is modeled as the eastbound/westbound roadway for applicable study intersections.

Weekday PM Peak Hour Trip Assignment Concord, California

FIGURE 7

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TRANSPORTATION ENGINEERING / PLANNING

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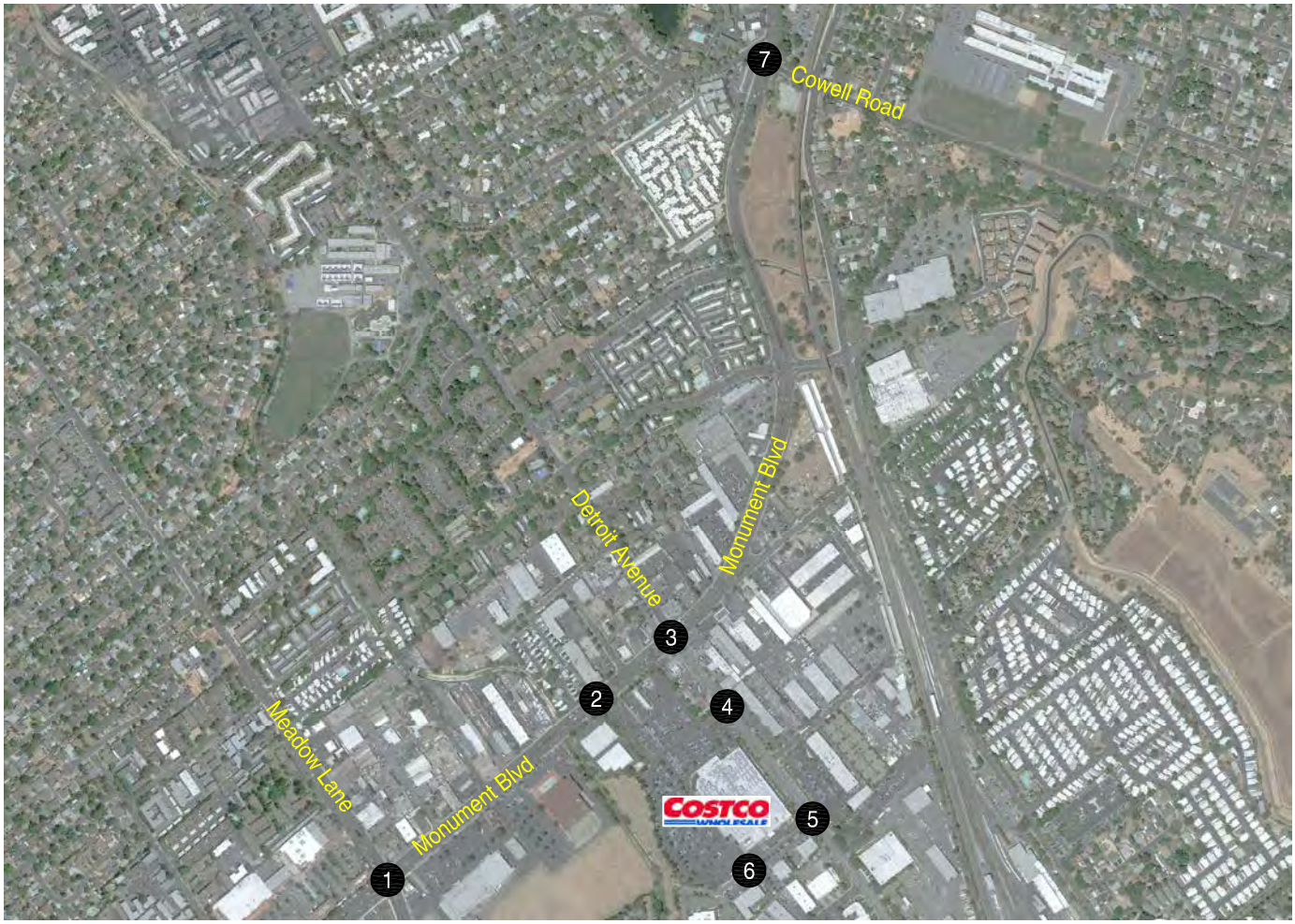

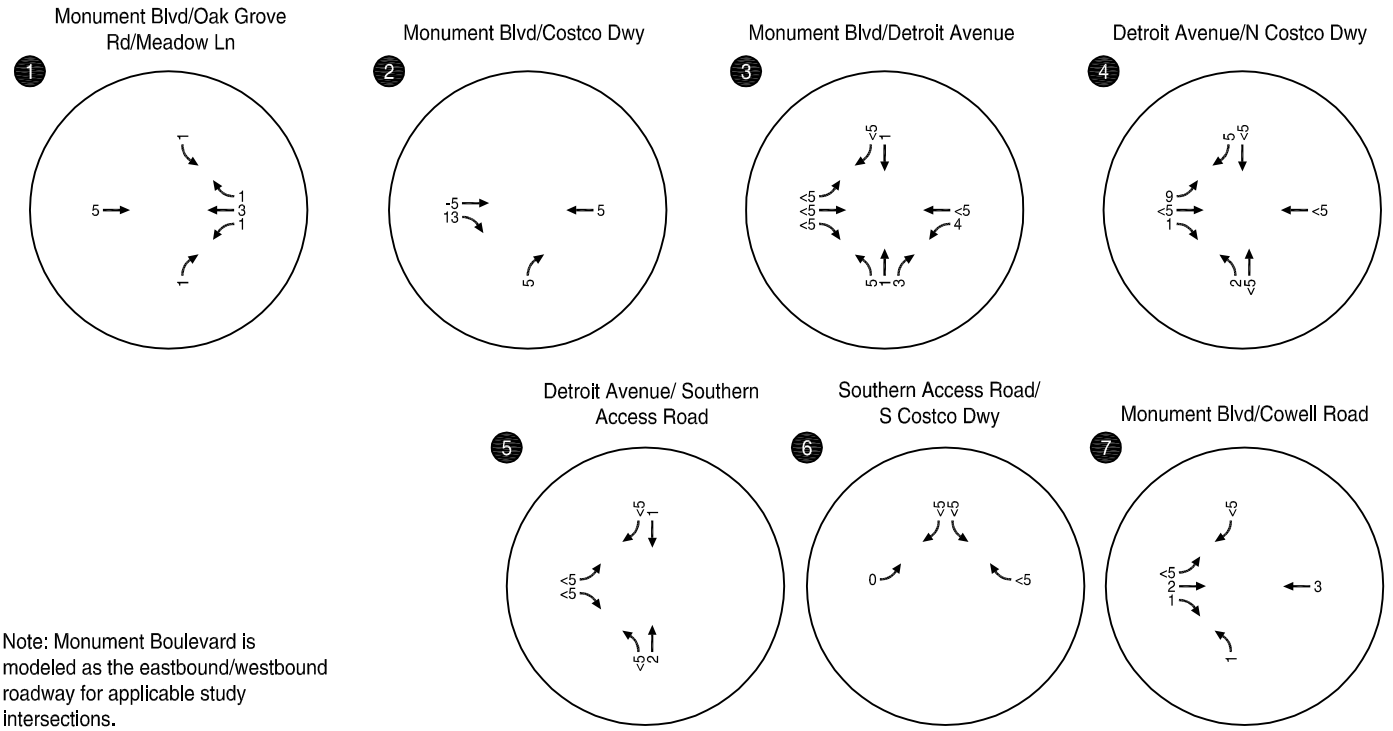

Note: Monument Boulevard is modeled as the eastbound/westbound roadway for applicable study intersections.

Weekend Midday Peak Hour Trip Assignment Concord, California

FIGURE **8**

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Traffic Volumes

Intersection operation results in the existing plus project scenario reflect existing traffic counts plus project-generated trips from the proposed gasoline fuel station expansion.

Level of Service Analysis

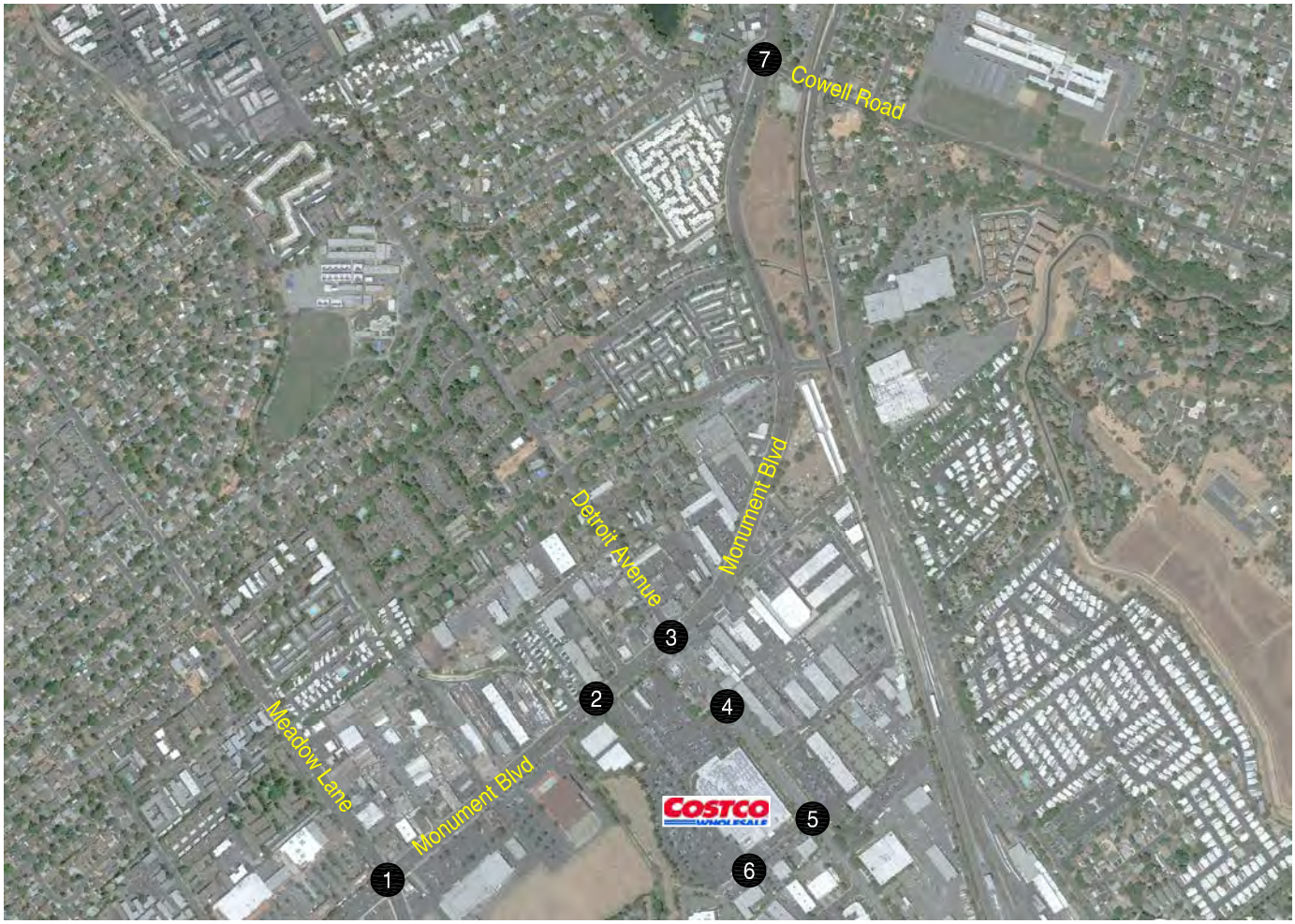
As mentioned previously, all level of service analyses described in this section were performed in accordance with the procedures stated in the *2000 Highway Capacity Manual* as required by the *City of Concord's 2030 General Plan*. The City of Concord has adopted level of service standards for signalized and unsignalized intersections. Based on Concord's General Plan, LOS "D" is considered acceptable at a signalized intersection outside of the Central Business District. A critical movement volume-to-capacity ratio of 0.90 and an LOS "E" are typically considered acceptable at an unsignalized intersection.

In accordance with *CCTA's Technical Procedures*[4] (Reference 3) and discussions with City of Concord Staff, intersections operating below LOS "D" without project-generated traffic would be considered to have a significant impact if project-generated traffic increases intersection delay by three seconds or more.

EXISTING PLUS PROJECT TRAFFIC CONDITIONS

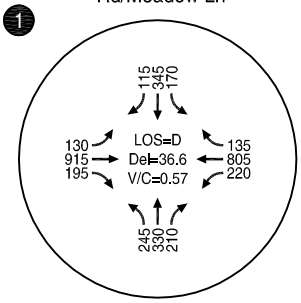
The existing plus project scenario analyzed how the study area's transportation system will operate with the project-generated traffic by the proposed fuel station expansion in the near term. The project-generated traffic (shown in Figure 7 and Figure 8) was added to the existing traffic volumes for the weekday p.m. and weekend midday peak hours (shown in Figure 4 and Figure 5) to arrive at the existing plus project traffic volumes and conditions presented in Figure 9 and Figure 10.

[4] DKS Associates. *Contra Costa Transportation Authority Final Technical Procedures,* Concord, California, January 2013.



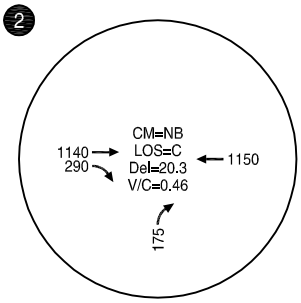
Monument Blvd/Oak Grove Rd/Meadow Ln

1



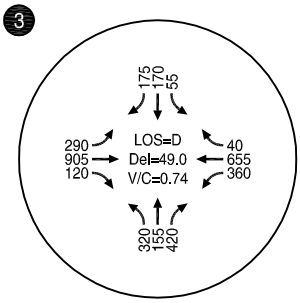
Monument Blvd/Costco Dwy

2



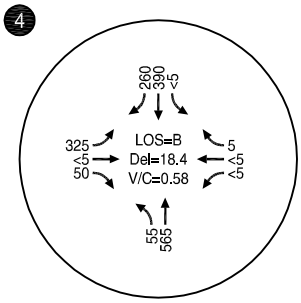
Monument Blvd/Detroit Avenue

3



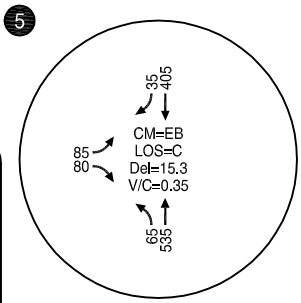
Detroit Avenue/N Costco Dwy

4



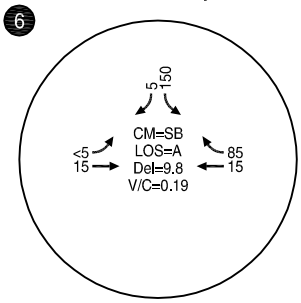
Detroit Avenue/ Southern Access Road

5



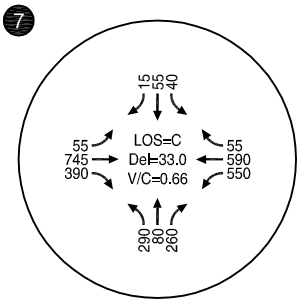
Southern Access Road/ S Costco Dwy

6



Monument Blvd/Cowell Road

7



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Existing Plus Project
Weekday PM Peak Hour Traffic Conditions
Concord, California

FIGURE **9**

KITTELSON & ASSOCIATES, INC.
TRANSPORTATION ENGINEERING / PLANNING

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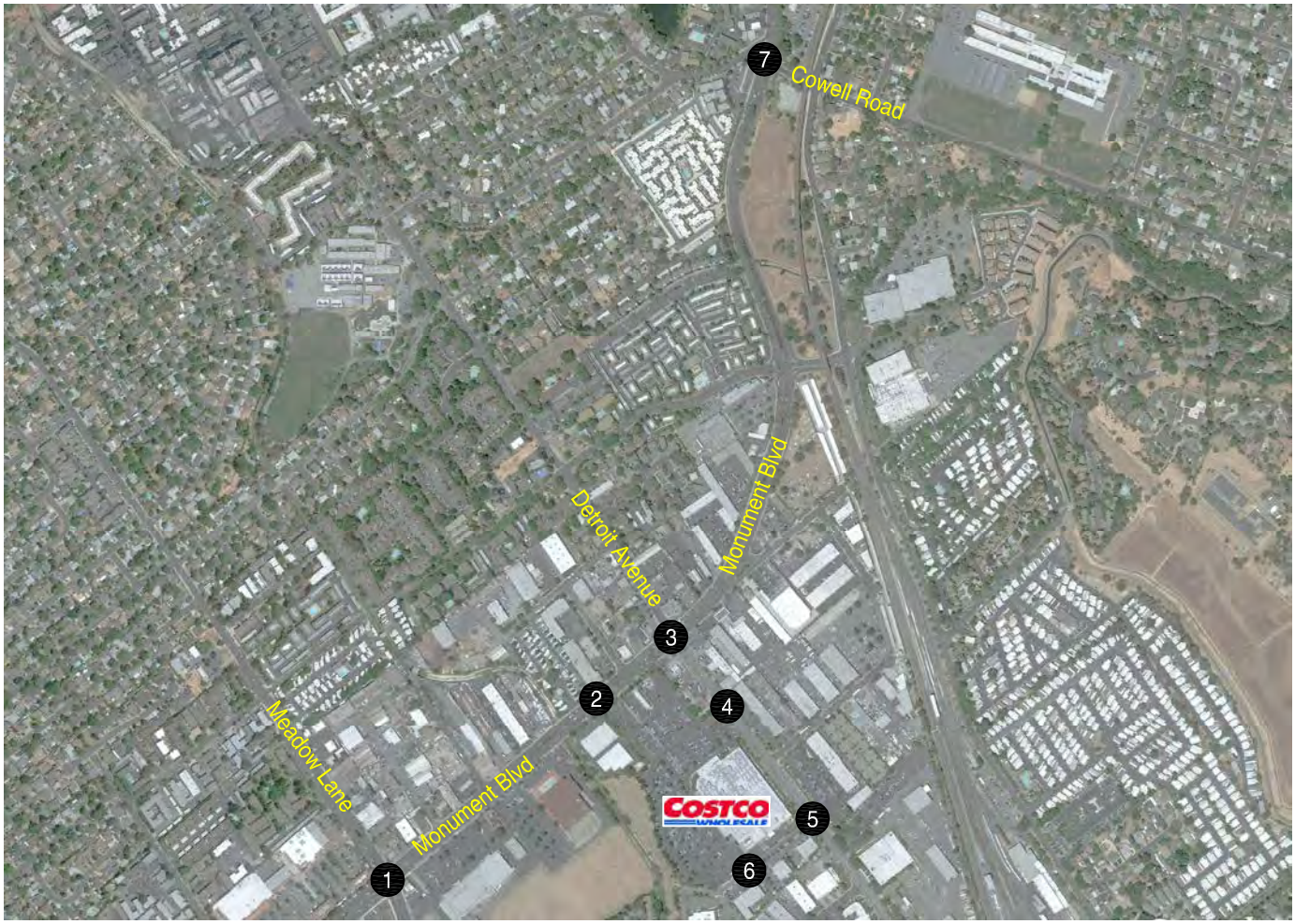
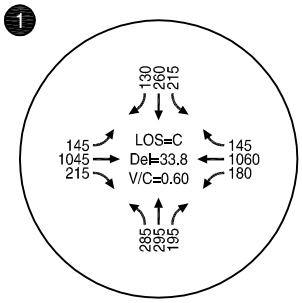


Monument Blvd/Oak Grove Rd/Meadow Ln



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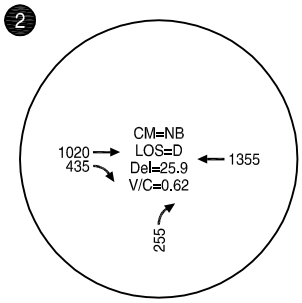

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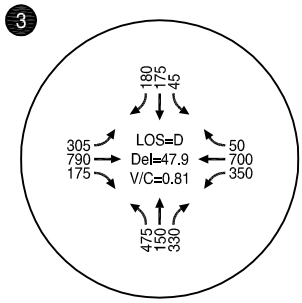

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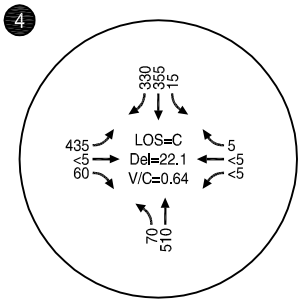
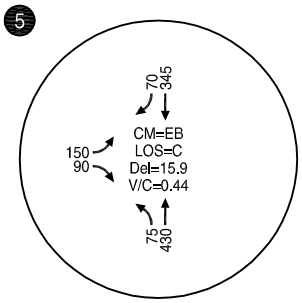
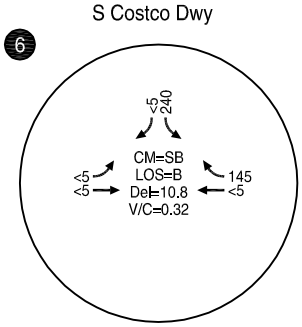


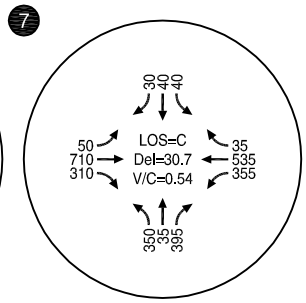
Detroit Avenue/ Southern Access Road



Southern Access Road/ S Costco Dwy



Monument Blvd/Cowell Road



Note: Monument Boulevard is modeled as the eastbound/westbound roadway for applicable study intersections.

LEGEND

CM = CRITICAL MOVEMENT (UNSIGNALIZED)

LOS = INTERSECTION LEVEL OF SERVICE (SIGNALIZED)/CRITICAL MOVEMENT LEVEL OF SERVICE (UNSIGNALIZED)

Del = INTERSECTION AVERAGE CONTROL DELAY (SIGNALIZED)/CRITICAL MOVEMENT CONTROL DELAY (UNSIGNALIZED)

V/C = CRITICAL VOLUME-TO-CAPACITY RATIO

Existing Plus Project
Weekend Midday Peak HourTraffic Conditions
Concord, California

FIGURE **10**

KITTELSON & ASSOCIATES, INC.
TRANSPORTATION ENGINEERING / PLANNING

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Intersection Level of Service

Table 6 presents the existing plus project traffic operation results at each of the study intersections. The results of the existing plus project traffic analysis indicate that all of the study intersections and site driveways are forecast to operate at acceptable levels of service during the weekday p.m. and weekend midday peak hours. *Appendix "C" contains the year 2014 existing plus project traffic operation worksheets.*

Table 6. Existing Plus Project Traffic Operations

Study Intersection	Peak Period	Existing Plus Project Traffic Operations		
		LOS[1]	Delay[2]	V/C Ratio[3]
1. Monument Blvd/Oak Grove Rd	PM Peak	D	36.6	0.57
	MID Peak	C	33.8	0.60
2. Monument Blvd/Costco Dwy	PM Peak	C	20.3	0.46
	MID Peak	D	25.9	0.62
3. Monument Blvd/Detroit Ave	PM Peak	D	49.0	0.74
	MID Peak	D	47.9	0.81
4. Detroit Ave/N Costco Dwy	PM Peak	B	18.4	0.58
	MID Peak	C	22.1	0.64
5. Detroit Ave/Southern Access Rd	PM Peak	C	15.3	0.35
	MID Peak	C	15.9	0.44
6. Southern Access Dr/S Costco Dwy	PM Peak	A	9.8	0.19
	MID Peak	B	10.8	0.32
7. Monument Blvd/Cowell Rd	PM Peak	C	33.0	0.66
	MID Peak	C	30.7	0.54

Notes: [1] LOS = Level of Service; [2] Delay is reported in seconds per vehicle; [3] V/C Ratio is defined as vehicle-to-capacity ratio which calculates the number of vehicles divided by the capacity of the roadway/intersection during the peak 15 minutes of the peak hour.

As can be seen from Figure 9 and Figure 10 and Table 6, all study intersections were found to continue to operate at acceptable levels of service and volume-to-capacity ratios in the existing plus project scenarios. The project was not found to have a significant impact (increase intersection delay by three seconds or more) at any of the study intersections.

YEAR 2040 CUMULATIVE TRAFFIC CONDITIONS

The year 2040 cumulative traffic conditions analysis forecasts how the study area's transportation system will operate in the long-term both with and without the proposed fuel station expansion.

Traffic Volumes

The growth rate used in this analysis was derived from the loaded networks of the Contra Costa Countywide Travel Demand Model provided by the Contra Costa Transportation Authority (CCTA). Loaded model plots were provided for the p.m. peak hour in year 2013 and year 2040. The CCTA Travel Demand Model predicts an annual growth rate along Monument Boulevard and within the site vicinity to be 0.9-percent per year from 2013 to 2040. City staff verified that a 0.9-percent annual growth rate should be assumed between year 2014 and year 2040.

Ultimately, the cumulative year 2040 traffic volumes were developed by applying a 0.9-percent annual growth rate to the existing traffic volumes shown in Figure 4 and Figure 5. To analyze the impacts of project-generated trips in year 2040, both cumulative scenarios accounted for 0.9-percent of annual growth. The cumulative plus project scenario accounts for Costco Gasoline fuel station expansion's project-generated trips plus annual growth

Figure 11 and Figure 12 summarize the turning movements volumes and traffic operations results at each of the study intersections for the 2040 cumulative scenario for the weekday p.m. and weekend midday peak hour, respectively.

Intersection Level of Service

This analysis determined that all of the study intersections will continue to operate with acceptable levels of service during the weekday p.m. and weekend midday peak hours with the following exceptions:

- Monument Boulevard/Costco Driveway during the weekend midday peak hour; and
- Monument Boulevard/Detroit Avenue during the weekday p.m. and weekend midday peak hours.

Again, these results are without the proposed project traffic. Table 7 also summarizes the results of the cumulative traffic conditions at each of the study intersections. *Appendix "D" includes the year 2040 cumulative traffic operations worksheets.*

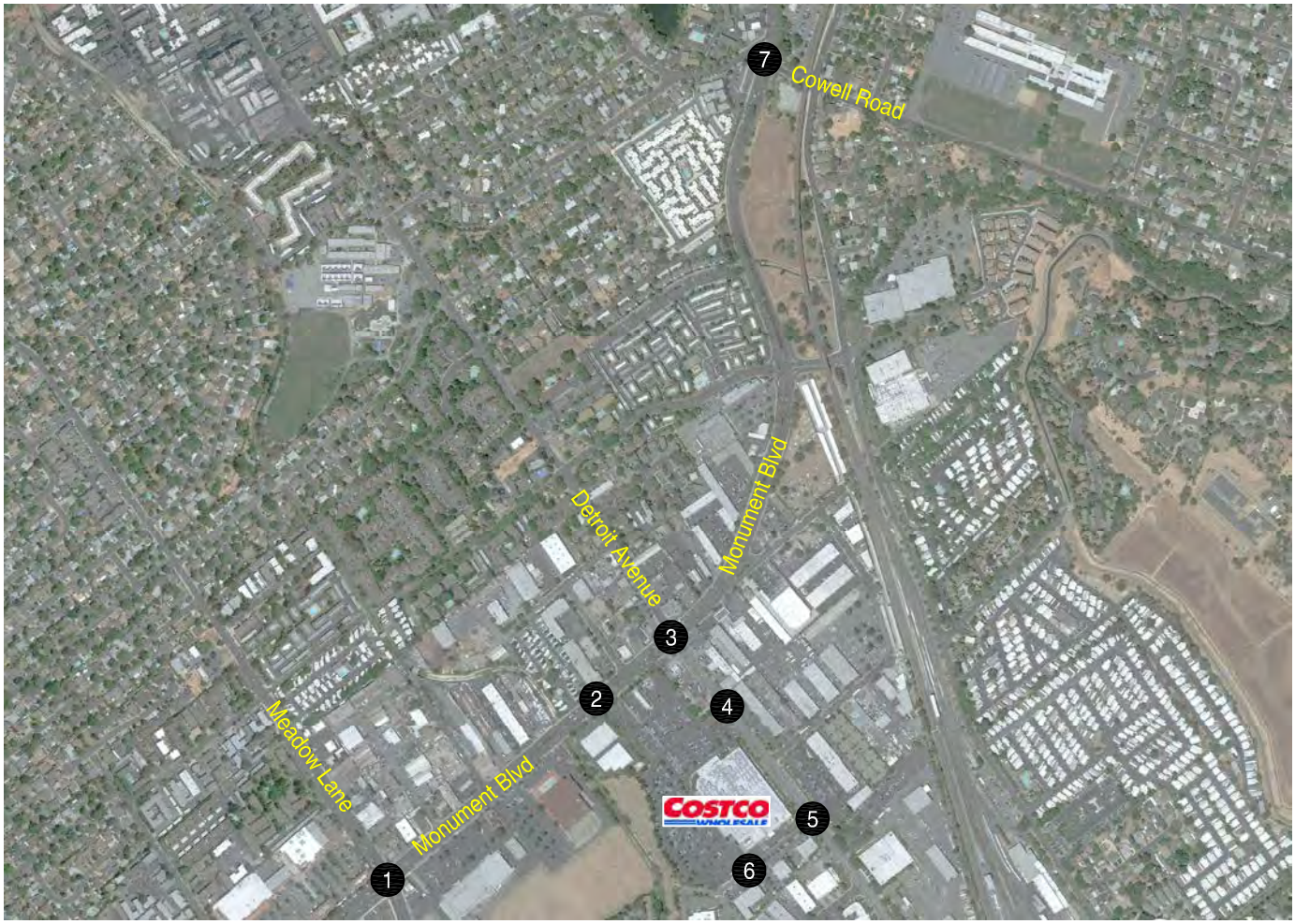
Table 7. Year 2040 Cumulative Traffic Operation Results

Study Intersection	Peak Period	Year 2040 Cumulative Traffic Operations		
		LOS[1]	Delay[2]	V/C Ratio[3]
1. Monument Blvd/Oak Grove Rd	PM Peak	D	38.4	0.67
	MID Peak	D	35.6	0.73
2. Monument Blvd/Costco Dwy	PM Peak	C	24.6	0.54
	MID Peak	**E**	**47.2**	**0.83**
3. Monument Blvd/Detroit Ave	**PM Peak**	**E**	**62.0**	**0.87**
	MID Peak	**F**	**81.4**	**0.97**
4. Detroit Ave/N Costco Dwy	PM Peak	C	21.0	0.64
	MID Peak	C	28.2	0.72
5. Detroit Ave/Southern Access Rd	PM Peak	C	17.6	0.43
	MID Peak	C	20.7	0.58
6. Southern Access Dr/S Costco Dwy	PM Peak	B	10.0	0.21
	MID Peak	B	11.0	0.34
7. Monument Blvd/Cowell Rd	PM Peak	D	36.9	0.76
	MID Peak	C	33.1	0.66

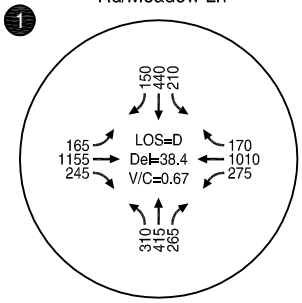
Notes: [1] LOS = Level of Service; [2] Delay is reported in seconds per vehicle; [3] V/C Ratio is defined as vehicle-to-capacity ratio which calculates the number of vehicles divided by the capacity of the roadway/intersection during the peak 15 minutes of the peak hour. **Bold and highlighted text** represents intersections operating below the City of Concord's level of service standards.

Traffic operation results at the unsignalized intersection of Monument Boulevard/Costco Driveway are reporting the level of service (LOS), delay and vehicle-to-capacity ratio of the critical movement or approach. The critical movement corresponds to the stop controlled, northbound right movement which represents vehicles exiting Costco's site and turning right onto Monument Boulevard. Delay for this movement is greater than 40 seconds resulting in LOS "E" for the movement. Overall, the intersection which is a right-in/right-out access for the Costco site is still operating well under capacity (v/c of 0.54 and 0.83) during both the weekday p.m. and the weekend midday peak hours in the 2040 cumulative scenario.

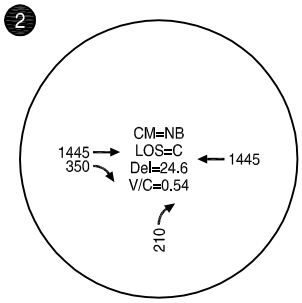
The signalized intersection of Monument Boulevard/Detroit Avenue operates below the City of Concord's intersection operation standards during the weekend p.m. and weekday midday peak hours under the 2040 cumulative scenario. The westbound, northbound and southbound approaches are over capacity resulting in an average delay at the intersection exceeding one minute during the weekend p.m. peak period. Similarly, the westbound and northbound approaches during the weekend midday peak hour are over capacity.



Monument Blvd/Oak Grove Rd/Meadow Ln



Monument Blvd/Costco Dwy



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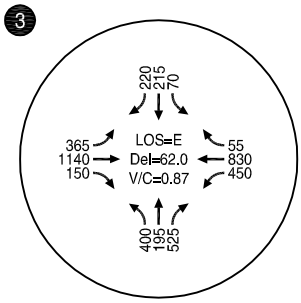

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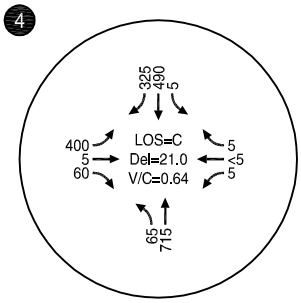

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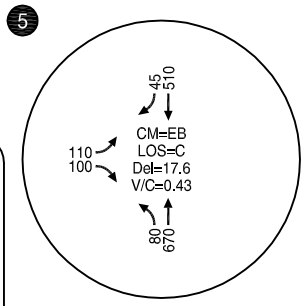

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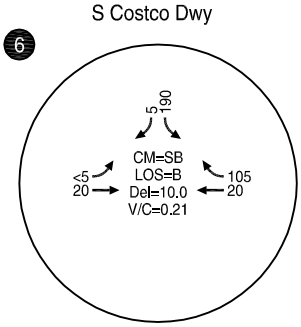
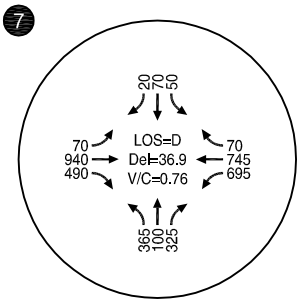


Monument Blvd/Cowell Road



Note: Monument Boulevard is modeled as the eastbound/westbound roadway for applicable study intersections.

LEGEND

CM = CRITICAL MOVEMENT (UNSIGNALIZED)

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V/C = CRITICAL VOLUME-TO-CAPACITY RATIO

Cumulative
Weekday PM Peak Hour Traffic Conditions
Concord, California

FIGURE 11

KITTELSON & ASSOCIATES, INC.
TRANSPORTATION ENGINEERING / PLANNING

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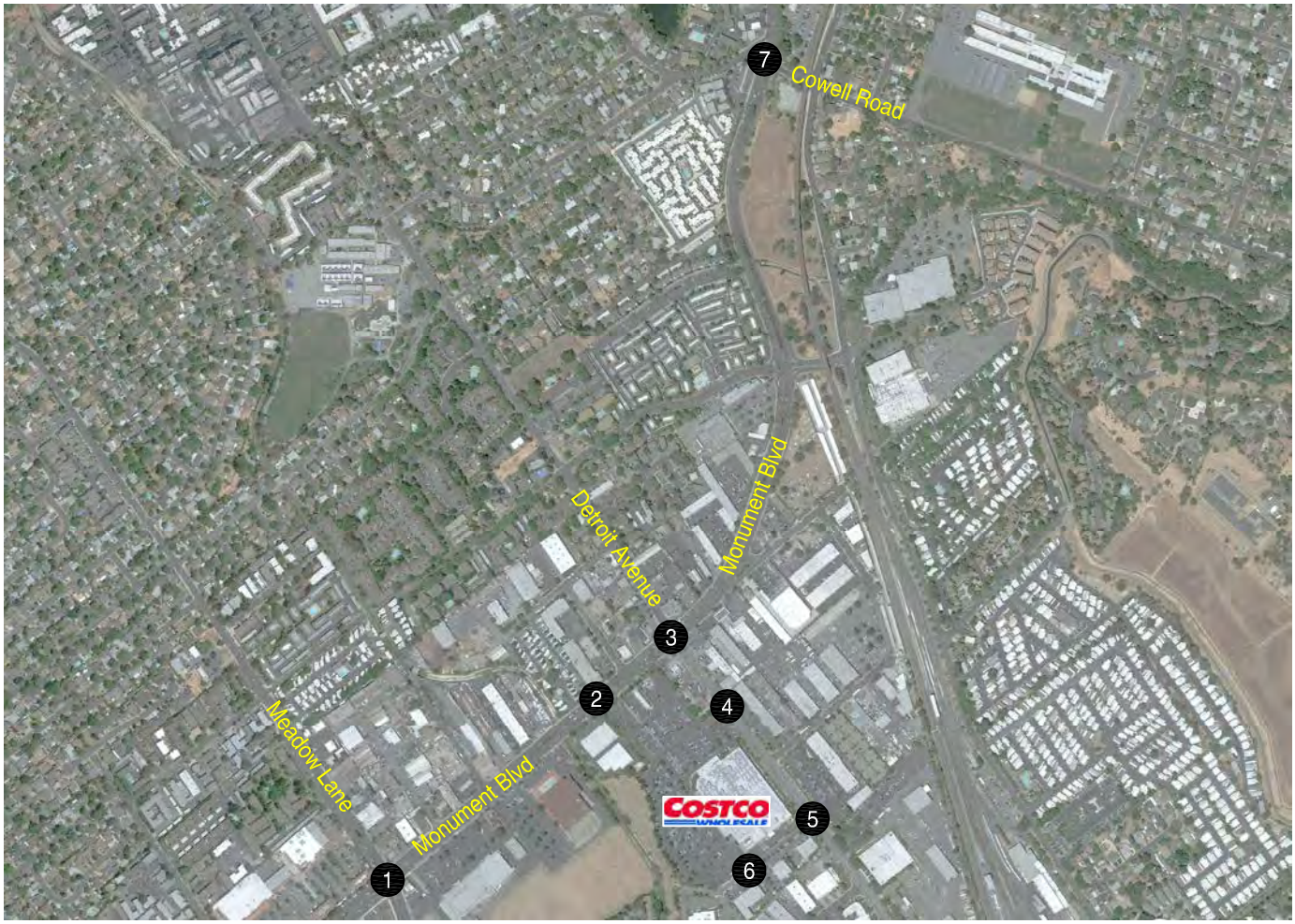
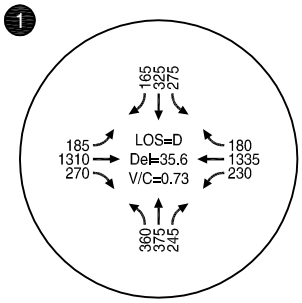
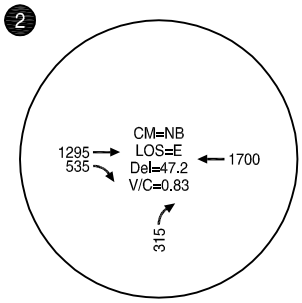


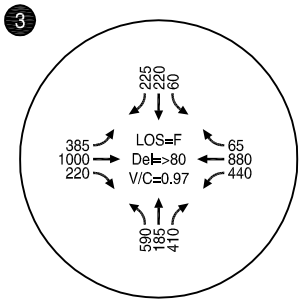
Monument Blvd/Oak Grove Rd/Meadow Ln



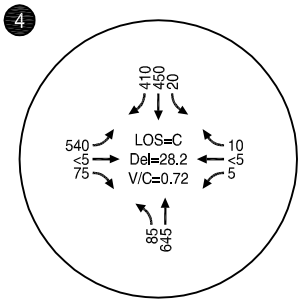
Monument Blvd/Costco Dwy



Monument Blvd/Detroit Avenue



Detroit Avenue/N Costco Dwy



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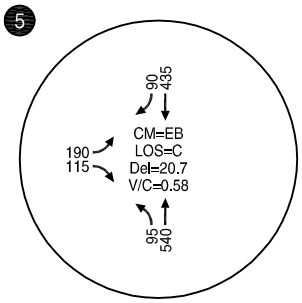
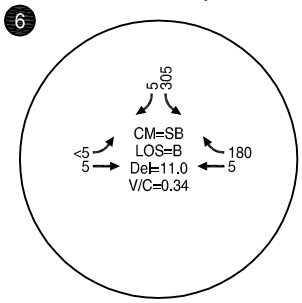
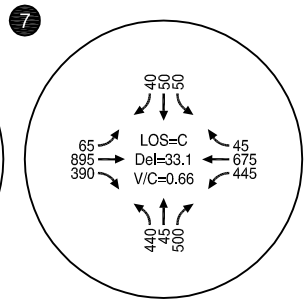


Southern Access Road/ S Costco Dwy



Monument Blvd/Cowell Road



Note: Monument Boulevard is modeled as the eastbound/westbound roadway for applicable study intersections.

LEGEND

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LOS = INTERSECTION LEVEL OF SERVICE (SIGNALIZED)/CRITICAL MOVEMENT LEVEL OF SERVICE (UNSIGNALIZED)

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V/C = CRITICAL VOLUME-TO-CAPACITY RATIO

Cumulative
Weekend Midday Peak Hour Traffic Conditions
Concord, California

FIGURE **12**

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YEAR 2040 CUMULATIVE PLUS PROJECT TRAFFIC CONDITIONS

The year 2040 cumulative plus project traffic conditions analysis forecasts how the study area's transportation system will operate in 2040 including traffic from the proposed gasoline fuel station expansion.

Traffic Volumes

The cumulative plus project scenario turning movement traffic volumes are the sum of the project-generated trips due to the expansion of the gasoline fuel station expansion and the 2040 cumulative scenario traffic volumes (shown in Figure 11 and Figure 12) which were developed from existing counts collected in 2014 grown by a 0.9-percent annual growth rate calculated from the loaded networks of the Contra Costa Countywide Travel Demand Model.

Figure 13 and Figure 14 summarize the cumulative plus project traffic volumes and operational conditions for the weekday p.m. peak hour and weekend midday peak hour, respectively.

Intersection Level of Service

As under the cumulative scenario, all study intersections were found to continue to operate acceptably in the 2040 cumulative plus project scenario with the following exceptions:

- Monument Boulevard/Costco Driveway during the weekend midday peak hour
- Monument Boulevard/Detroit Avenue during the weekday p.m. and weekend midday peak hours.

Again, these are the same locations that were found to exceed City of Concord standards in the cumulative scenario (without any project related traffic). If project-generated traffic from the proposed fuel station expansion increases either of the intersection's average delay by more than three seconds, the Project would be considered to have a significant impact at these locations. Likewise if any of the intersections operating at an acceptable level of service drop below LOS "D," the Project would be considered to have a significant impact. Table 8 includes the results of the cumulative plus project traffic conditions at each of the study intersections. Bold cells represent intersection conditions below the City's level of service standards, but do not represent a significant impact due to the project-generated trips.

Table 8. Year 2040 Cumulative Plus Project Traffic Operation Results

Study Intersection	Peak Period	Year 2040 Cumulative Plus Project Traffic Operations		
		LOS[1]	Delay[2]	V/C Ratio[3]
1. Monument Blvd/Oak Grove Rd	PM Peak	D	38.4	0.67
	MID Peak	D	35.6	0.73
2. Monument Blvd/Costco Dwy	PM Peak	D	25.4	0.56
	MID Peak	**E**	**50.1**	**0.85**
3. Monument Blvd/Detroit Ave	**PM Peak**	**E**	**62.6**	**0.87**
	MID Peak	**F**	**81.7**	**0.97**
4. Detroit Ave/N Costco Dwy	PM Peak	C	21.4	0.64
	MID Peak	C	28.8	0.72
5. Detroit Ave/Southern Access Rd	PM Peak	C	17.6	0.43
	MID Peak	C	20.7	0.58
6. Southern Access Dr/S Costco Dwy	PM Peak	B	10.0	0.21
	MID Peak	B	11.0	0.34
7. Monument Blvd/Cowell Rd	PM Peak	D	36.9	0.76
	MID Peak	C	33.2	0.66

Notes: [1] LOS = Level of Service; [2] Delay is reported in seconds per vehicle; [3] V/C Ratio is defined as vehicle-to-capacity ratio which calculates the number of vehicles divided by the capacity of the roadway/intersection during the peak 15 minutes of the peak hour. **Bold text** represents intersections operating below the City of Concord's level of service standards, but is not significantly impacted by the project-generated trips.

The cumulative plus project analysis determined that the project-generated trips do not have a significant impact at any of the study intersections. The unsignalized intersection of Monument Boulevard/Costco Driveway during the weekend midday peak hour and the signalized intersection of Monument Boulevard/Detroit Avenue during the weekday p.m. and weekend midday peak hours, continued to operate below the City's level of service standards. However, the project-generated trips did not increase delay at either of the intersections in either peak hour scenario by more than three seconds.

Table 9. Cumulative Impacted Intersections Compared to Cumulative Plus Project

Study Intersection	Peak Period	Year 2040 Cumulative Traffic Operations			Year 2040 Cumulative + Project Traffic Operations		
		LOS[1]	Delay[2]	V/C Ratio[3]	LOS[1]	Delay[2]	V/C Ratio[3]
2. Monument Blvd/Costco Dwy	MID Peak	E	47.2	0.83	E	50.1	0.85
3. Monument Blvd/Detroit Ave	PM Peak	E	62.0	0.87	E	62.6	0.87
	MID Peak	F	81.4	0.97	F	81.7	0.97

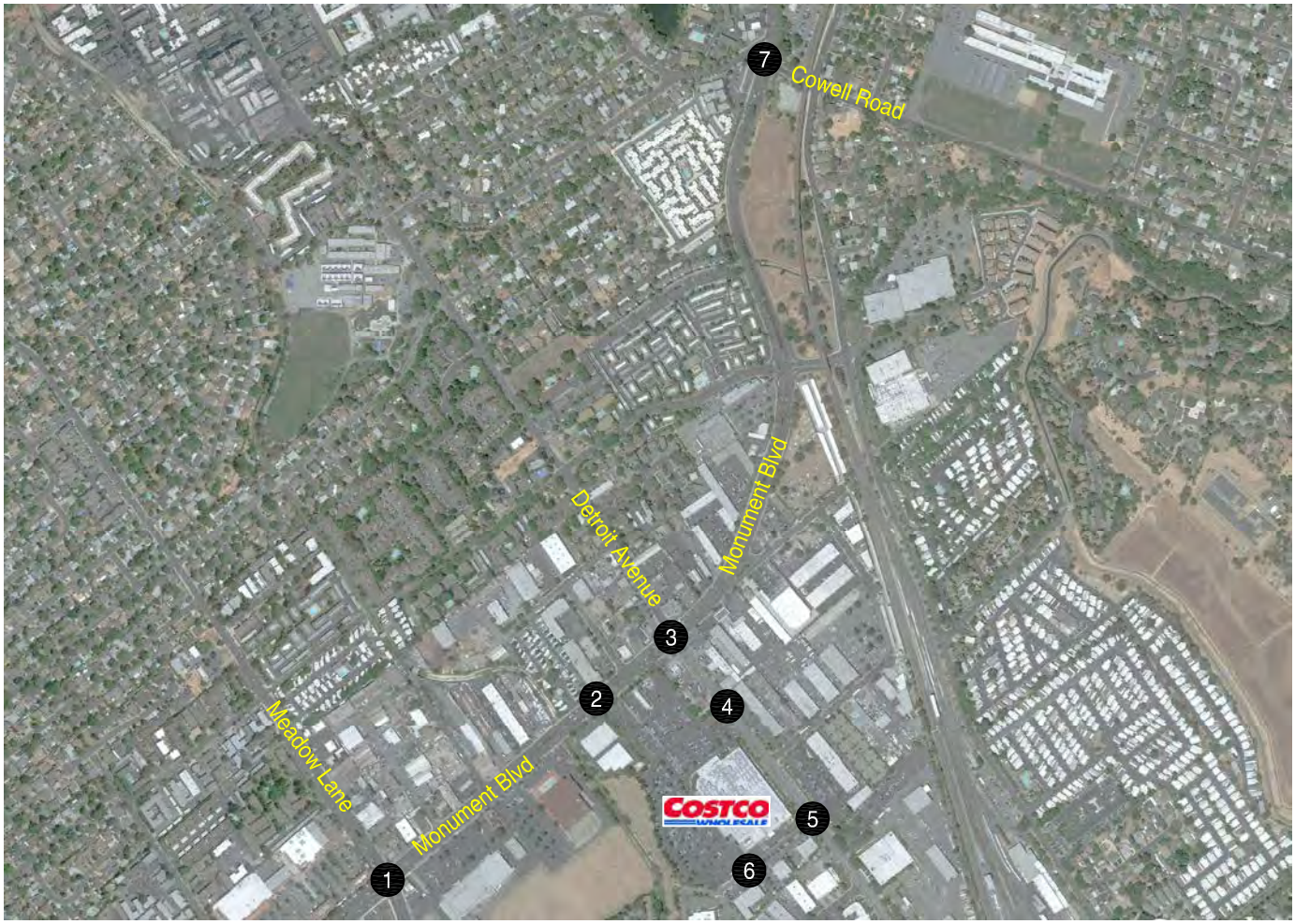
Notes: [1] LOS = Level of Service; [2] Delay is reported in seconds per vehicle; [3] V/C Ratio is defined as vehicle-to-capacity ratio which calculates the number of vehicles divided by the capacity of the roadway/intersection during the peak 15 minutes of the peak hour.

Table 9 displays the comparison between the cumulative and cumulative plus project intersection operations at study intersections 2 and 3.

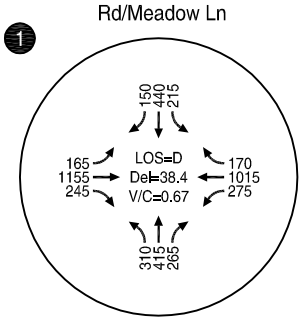
- Intersection 2 – Operates at LOS "E" during the weekend midday peak hour, project-generated traffic increases delay by 2.9 seconds;

- Intersection 3 – Operates at LOS "E" during the weekday p.m. peak hour, project-generated traffic increases delay by 0.6 seconds; and
- Intersection 3 – Operates at LOS "F" during the weekend midday peak hour, project-generated traffic increases delay by 0.3 seconds.

Overall, project-generated trips due to the proposed Costco Gasoline fuel station expansion do not significantly impact any of the study intersections in either the weekday p.m. or weekend midday peak hours. Figure 13 and Figure 14 illustrate the turning movement counts and traffic conditions at each of the study intersections during the weekday p.m. peak hour and weekend midday peak hours, respectively. *Appendix "E" includes the year 2040 cumulative plus project traffic operation worksheets.*



Monument Blvd/Oak Grove Rd/Meadow Ln



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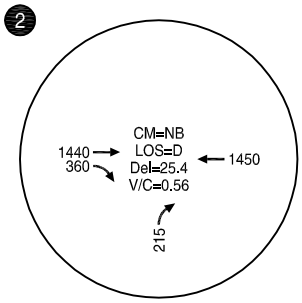

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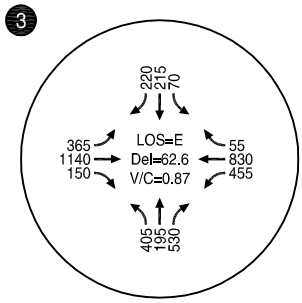

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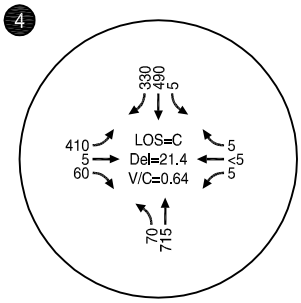
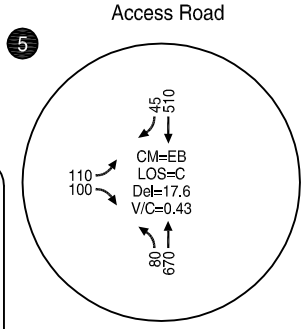
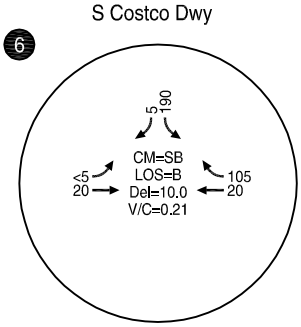


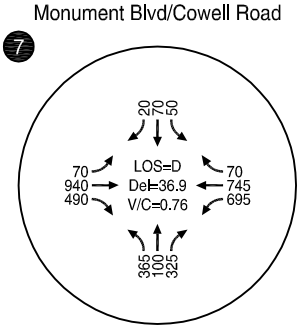
Detroit Avenue/ Southern Access Road



Southern Access Road/ S Costco Dwy



Monument Blvd/Cowell Road



Note: Monument Boulevard is modeled as the eastbound/westbound roadway for applicable study intersections.

LEGEND

CM = CRITICAL MOVEMENT (UNSIGNALIZED)

LOS = INTERSECTION LEVEL OF SERVICE (SIGNALIZED)/CRITICAL MOVEMENT LEVEL OF SERVICE (UNSIGNALIZED)

Del = INTERSECTION AVERAGE CONTROL DELAY (SIGNALIZED)/CRITICAL MOVEMENT CONTROL DELAY (UNSIGNALIZED)

V/C = CRITICAL VOLUME-TO-CAPACITY RATIO

Cumulative Plus Project
Weekday PM Peak Hour Traffic Conditions
Concord, California

FIGURE 13

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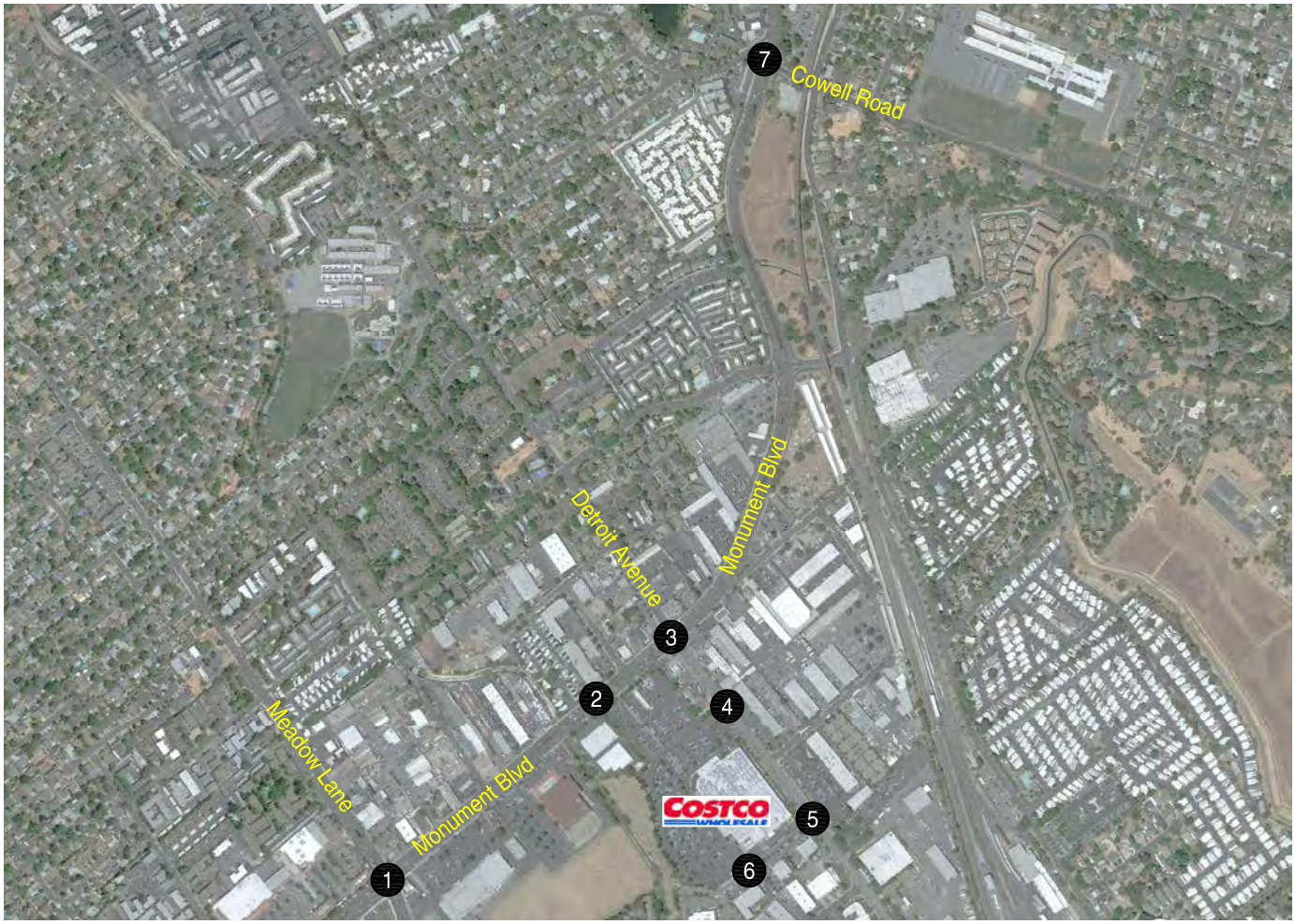
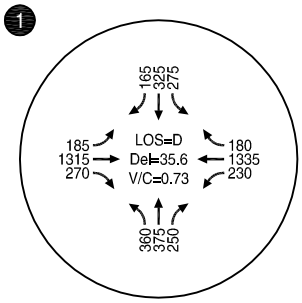
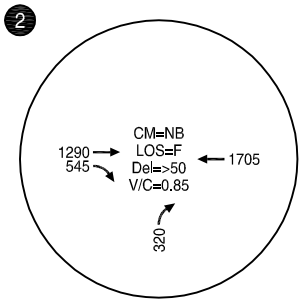


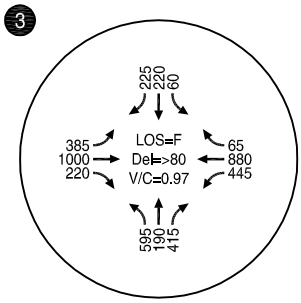
Monument Blvd/Oak Grove Rd/Meadow Ln



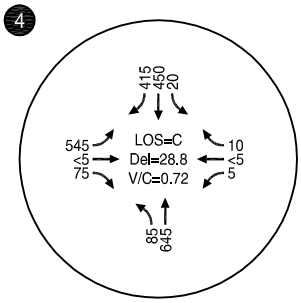
Monument Blvd/Costco Dwy



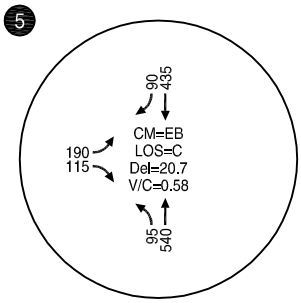
Monument Blvd/Detroit Avenue



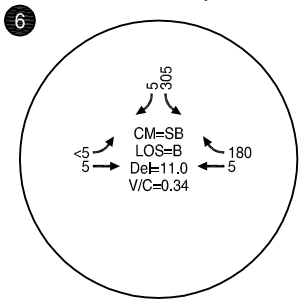
Detroit Avenue/N Costco Dwy



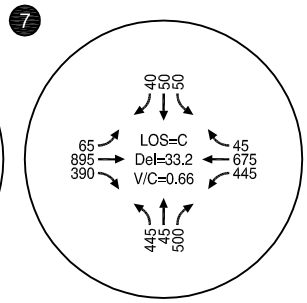
Detroit Avenue/ Southern Access Road



Southern Access Road/ S Costco Dwy



Monument Blvd/Cowell Road



Note: Monument Boulevard is modeled as the eastbound/westbound roadway for applicable study intersections.

LEGEND

CM = CRITICAL MOVEMENT (UNSIGNALIZED)
LOS = INTERSECTION LEVEL OF SERVICE (SIGNALIZED)/CRITICAL MOVEMENT LEVEL OF SERVICE (UNSIGNALIZED)
Del = INTERSECTION AVERAGE CONTROL DELAY (SIGNALIZED)/CRITICAL MOVEMENT CONTROL DELAY (UNSIGNALIZED)
V/C = CRITICAL VOLUME-TO-CAPACITY RATIO

Cumulative Plus Project
Weekend Midday Peak Hour Traffic Conditions
Concord, California

FIGURE 14

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INTERSECTION QUEUE ANALYSIS

In addition to the traffic operations analysis the City of Concord requested an intersection queuing analysis at each of the study intersections. KAI looked at the impact of the project-generated trips on 95th percentile queue lengths, which represent queue lengths not expected to be exceeded during 95% of the peak hour. The queue analysis was run for existing and existing plus project, as well as cumulative and cumulative plus project scenarios.

Using Trafficware's Synchro 8 program, the queue analysis analyzed 95th percentile queues at each of the study intersections, including site driveways. Results from Synchro 8 for the weekday p.m. and weekend midday peak hours were verified by field observations when vehicle turning movement counts were collected in November 2014. Results of the 95th percentile queue lengths have been rounded up to the next 25th-foot representing the length of storage needed for one vehicle.

Existing and Existing Plus Project Scenarios

There are two intersections that have vehicular movements exceeding their storage length during the existing weekday p.m. and weekend midday peak hours. The signalized intersections of Monument Boulevard/Detroit Avenue has 95th percentile queues lengths exceeding queue storage for the eastbound left and northbound left movements. The signalized intersection of Monument Boulevard/Cowell Road has 95th percentile queues exceeding storage lengths in the eastbound right, northbound left, and southbound left movements during the weekday p.m. peak hour and the northbound left and southbound left movements during the weekend midday peak hour.

The 95th percentile queue of the northbound left movement at the signalized intersection of Monument Boulevard/Oak Grove Road is at, but not exceeding storage capacity during the existing weekday p.m. and weekend midday peak hours. When adding project-generated traffic to the transportation network, queue lengths are not increased at any of the intersections, including the intersections that have impacts under existing conditions. Table 10 and Table 11 include queuing results at each of the study intersection during the existing weekday p.m. and weekend midday peak hour scenarios.

Table 10. Existing Scenario Weekday PM Peak Hour 95th Percentile Queues

Intersection	Queue Lengths (ft)[1]	EBL	EBR	WBL	WBR	NBL	NBR	SBL	SBR
Existing									
1. Monument Blvd/Oak Grove Rd	Storage Length (ft)	150	275	250	-	175	-	175	200
	95th Percentile (ft)	100	50	150	-	175	-	125	75
2. Monument Blvd/Costco Dwy	Storage Length (ft)	-	-	-	-	325	-	-	-
	95th Percentile (ft)	-	-	-	-	75	-	-	-
3. Monument Blvd/Detroit Ave	Storage Length (ft)	250	-	700	-	225	-	130	-
	95th Percentile (ft)	**425**	-	225	-	**325**	-	100	-
4. Detroit Ave/N Costco Dwy	Storage Length (ft)	-	175	-	-	125	-	85	-
	95th Percentile (ft)	-	25	-	-	75	-	25	-
5. Detroit Ave/Southern Access Rd	Storage Length (ft)	150	-	-	-	150	-	-	-
	95th Percentile (ft)	50	-	-	-	25	-	-	-
6. Southern Access Dr/S Costco Dwy	Storage Length (ft)	-	-	-	-	-	-	150	-
	95th Percentile (ft)	-	-	-	-	-	-	25	-
7. Monument Blvd/Cowell Rd	Storage Length (ft)	150	150	300	-	200	200	40	60
	95th Percentile (ft)	100	**175**	275	-	**225**	75	**75**	0
Existing Plus Project									
1. Monument Blvd/Oak Grove Rd	Storage Length (ft)	150	275	250	-	175	-	175	200
	95th Percentile (ft)	100	50	150	-	175	-	125	75
2. Monument Blvd/Costco Dwy	Storage Length (ft)	-	-	-	-	325	-	-	-
	95th Percentile (ft)	-	-	-	-	75	-	-	-
3. Monument Blvd/Detroit Ave	Storage Length (ft)	250	-	700	-	225	-	130	-
	95th Percentile (ft)	**425**	-	225	-	**325**	-	100	-
4. Detroit Ave/N Costco Dwy	Storage Length (ft)	-	175	-	-	125	-	85	-
	95th Percentile (ft)	-	25	-	-	100	-	25	-
5. Detroit Ave/Southern Access Rd	Storage Length (ft)	150	-	-	-	150	-	-	-
	95th Percentile (ft)	50	-	-	-	25	-	-	-
6. Southern Access Dr/S Costco Dwy	Storage Length (ft)	-	-	-	-	-	-	150	-
	95th Percentile (ft)	-	-	-	-	-	-	25	-
7. Monument Blvd/Cowell Rd	Storage Length (ft)	150	150	300	-	200	200	40	60
	95th Percentile (ft)	100	**175**	275	-	**225**	75	**75**	0

Notes: [1] 95th percentile queue lengths have been rounded to the next 25th-foot, one vehicle represent 25 feet of storage; [2] The westbound left storage includes one dedicated left lane and an left-turn storage lane of 250 feet, total storage length in excess of 700 feet. **Bold** indicates 95th percentile queues exceeding the storage length.

Table 11. Existing Scenario Weekend Midday Peak Hour 95th Percentile Queues

Intersection	Queue Lengths (ft)[1]	EBL	EBR	WBL	WBR	NBL	NBR	SBL	SBR
Existing									
1. Monument Blvd/Oak Grove Rd	Storage Length (ft)	150	275	250	-	175	-	175	200
	95th Percentile (ft)	100	50	100	-	175	-	150	75
2. Monument Blvd/Costco Dwy	Storage Length (ft)	-	-	-	-	325	-	-	-
	95th Percentile (ft)	-	-	-	-	100	-	-	-
3. Monument Blvd/Detroit Ave	Storage Length (ft)	250	-	700	-	225	-	130	-
	95th Percentile (ft)	**400**	-	225	-	**425**	-	75	-
4. Detroit Ave/N Costco Dwy	Storage Length (ft)	-	175	-	-	125	-	85	-
	95th Percentile (ft)	-	0	-	-	100	-	50	-
5. Detroit Ave/Southern Access Rd	Storage Length (ft)	150	-	-	-	150	-	-	-
	95th Percentile (ft)	75	-	-	-	25	-	-	-
6. Southern Access Dr/S Costco Dwy	Storage Length (ft)	-	-	-	-	-	-	150	-
	95th Percentile (ft)	-	-	-	-	-	-	50	-
7. Monument Blvd/Cowell Rd	Storage Length (ft)	150	150	300	-	200	200	40	60
	95th Percentile (ft)	100	125	175	-	**225**	100	**75**	0
Existing Plus Project									
1. Monument Blvd/Oak Grove Rd	Storage Length (ft)	150	275	250	-	175	-	175	200
	95th Percentile (ft)	100	50	100	-	175	-	150	75
2. Monument Blvd/Costco Dwy	Storage Length (ft)	-	-	-	-	325	-	-	-
	95th Percentile (ft)	-	-	-	-	125	-	-	-
3. Monument Blvd/Detroit Ave	Storage Length (ft)	250	-	700	-	225	-	130	-
	95th Percentile (ft)	**400**	-	200	-	**425**	-	75	-
4. Detroit Ave/N Costco Dwy	Storage Length (ft)	-	175	-	-	125	-	85	-
	95th Percentile (ft)	-	0	-	-	125	-	50	-
5. Detroit Ave/Southern Access Rd	Storage Length (ft)	150	-	-	-	150	-	-	-
	95th Percentile (ft)	75	-	-	-	25	-	-	-
6. Southern Access Dr/S Costco Dwy	Storage Length (ft)	-	-	-	-	-	-	150	-
	95th Percentile (ft)	-	-	-	-	-	-	50	-
7. Monument Blvd/Cowell Rd	Storage Length (ft)	150	150	300	-	200	200	40	60
	95th Percentile (ft)	100	125	175	-	**225**	100	**75**	0

Notes: [1] 95th percentile queue lengths have been rounded to the next 25th-foot, one vehicle represent 25 feet of storage; [2] The westbound left storage includes one dedicated left lane and an left-turn storage lane of 250 feet, total storage length in excess of 700 feet. **Bold** indicates 95th percentile queues exceeding the storage length.

Cumulative and Cumulative Plus Project Scenarios

Similar to the existing scenarios, the intersection of Monument Boulevard/Detroit Avenue and Monument Boulevard/Cowell Road reported 95th percentile queues exceeding storage length in the cumulative scenario during the weekday p.m. peak hour. The project-generated trips did not increase or significantly impact queue lengths at any of the study intersections in the cumulative plus project scenario. Table 12 includes the queuing results at each of the study intersections during the weekday p.m. peak hours.

Table 12. Cumulative Scenario Weekday PM Peak Hour 95th Percentile Queues

Intersection	Queue Lengths (ft)[1]	EBL	EBR	WBL	WBR	NBL	NBR	SBL	SBR
Cumulative									
1. Monument Blvd/Oak Grove Rd	Storage Length (ft)	150	275	250	-	175	-	175	200
	95th Percentile (ft)	125	75	125	-	175	-	150	75
2. Monument Blvd/Costco Dwy	Storage Length (ft)	-	-	-	-	325	-	-	-
	95th Percentile (ft)	-	-	-	-	100	-	-	-
3. Monument Blvd/Detroit Ave[2]	Storage Length (ft)	250	-	700	-	225	-	130	-
	95th Percentile (ft)	**550**	-	275	-	**400**	-	100	-
4. Detroit Ave/N Costco Dwy	Storage Length (ft)	-	175	-	-	125	-	85	-
	95th Percentile (ft)	-	25	-	-	100	-	25	-
5. Detroit Ave/Southern Access Rd	Storage Length (ft)	150	-	-	-	150	-	-	-
	95th Percentile (ft)	75	-	-	-	25	-	-	-
6. Southern Access Dr/S Costco Dwy	Storage Length (ft)	-	-	-	-	-	-	150	-
	95th Percentile (ft)	-	-	-	-	-	-	25	-
7. Monument Blvd/Cowell Rd	Storage Length (ft)	150	150	300	-	200	200	40	60
	95th Percentile (ft)	100	**250**	**400**	-	**250**	75	**75**	0
Cumulative Plus Project									
1. Monument Blvd/Oak Grove Rd	Storage Length (ft)	150	275	250	-	175	-	175	200
	95th Percentile (ft)	125	75	125	-	175	-	150	75
2. Monument Blvd/Costco Dwy[2]	Storage Length (ft)	-	-	-	-	325	-	-	-
	95th Percentile (ft)	-	-	-	-	100	-	-	-
3. Monument Blvd/Detroit Ave	Storage Length (ft)	250	-	700	-	225	-	130	-
	95th Percentile (ft)	**550**	-	275	-	**400**	-	100	-
4. Detroit Ave/N Costco Dwy	Storage Length (ft)	-	175	-	-	125	-	85	-
	95th Percentile (ft)	-	25	-	-	100	-	25	-
5. Detroit Ave/Southern Access Rd	Storage Length (ft)	150	-	-	-	150	-	-	-
	95th Percentile (ft)	100	-	-	-	25	-	-	-
6. Southern Access Dr/S Costco Dwy	Storage Length (ft)	-	-	-	-	-	-	150	-
	95th Percentile (ft)	-	-	-	-	-	-	50	-
7. Monument Blvd/Cowell Rd	Storage Length (ft)	150	150	300	-	200	200	40	60
	95th Percentile (ft)	100	**250**	**400**	-	**250**	75	**75**	0

Notes: [1] 95th percentile queue lengths have been rounded to the next 25th-foot, one vehicle represent 25 feet of storage; [2] The westbound left storage includes one dedicated left lane and an left-turn storage lane of 250 feet, total storage length in excess of 700 feet. **Bold** indicates 95th percentile queues exceeding the storage length.

Table 13 includes the queuing results at each of the study intersections during the weekend midday peak hour. The signalized intersections of Monument Boulevard/Oak Grove Road, Monument Boulevard/Detroit Avenue, and Monument Boulevard/Cowell Road experienced movements with 95th percentile queue lengths exceeding the available storage capacity in cumulative scenario during the weekend midday peak hour. Queue lengths did not increase or were not significantly impacted because of the project-generated trips in the cumulative plus project scenario.

Table 13. Cumulative Weekend Midday Peak Hour 95th Percentile Queues

Intersection	Queue Lengths (ft)	EBL	EBR	WBL	WBR	NBL	NBR	SBL	SBR
Cumulative									
1. Monument Blvd/Oak Grove Rd	Storage Length (ft)	150	275	250	-	175	-	175	200
	95th Percentile (ft)	125	75	75	-	**200**	-	175	75
2. Monument Blvd/Costco Dwy	Storage Length (ft)	-	-	-	-	325	-	-	-
	95th Percentile (ft)	-	-	-	-	200	-	-	-
3. Monument Blvd/Detroit Ave[2]	Storage Length (ft)	250	-	700	-	225	-	130	-
	95th Percentile (ft)	**550**	-	275	-	**550**	-	100	-
4. Detroit Ave/N Costco Dwy	Storage Length (ft)	-	175	-	-	125	-	85	-
	95th Percentile (ft)	-	25	-	-	125	-	50	-
5. Detroit Ave/Southern Access Rd	Storage Length (ft)	150	-	-	-	150	-	-	-
	95th Percentile (ft)	100	-	-	-	25	-	-	-
6. Southern Access Dr/S Costco Dwy	Storage Length (ft)	-	-	-	-	-	-	150	-
	95th Percentile (ft)	-	-	-	-	-	-	50	-
7. Monument Blvd/Cowell Rd	Storage Length (ft)	150	150	300	-	200	200	40	60
	95th Percentile (ft)	100	**200**	225	-	**250**	100	**75**	0
Cumulative Plus Project									
1. Monument Blvd/Oak Grove Rd	Storage Length (ft)	150	275	250	-	175	-	175	200
	95th Percentile (ft)	125	75	75	-	**200**	-	175	75
2. Monument Blvd/Costco Dwy	Storage Length (ft)	-	-	-	-	325	-	-	-
	95th Percentile (ft)	-	-	-	-	200	-	-	-
3. Monument Blvd/Detroit Ave[2]	Storage Length (ft)	250	-	700	-	225	-	130	-
	95th Percentile (ft)	**550**	-	275	-	**550**	-	100	-
4. Detroit Ave/N Costco Dwy	Storage Length (ft)	-	175	-	-	125	-	85	-
	95th Percentile (ft)	-	25	-	-	125	-	50	-
5. Detroit Ave/Southern Access Rd	Storage Length (ft)	150	-	-	-	150	-	-	-
	95th Percentile (ft)	100	-	-	-	25	-	-	-
6. Southern Access Dr/S Costco Dwy	Storage Length (ft)	-	-	-	-	-	-	150	-
	95th Percentile (ft)	-	-	-	-	-	-	50	-
7. Monument Blvd/Cowell Rd	Storage Length (ft)	150	150	300	-	200	200	40	60
	95th Percentile (ft)	100	**200**	225	-	**250**	100	**75**	0

Notes: [1] 95th percentile queue lengths have been rounded to the next 25th-foot, one vehicle represent 25 feet of storage; [2] The westbound left storage includes one dedicated left lane and an left-turn storage lane of 250 feet, total storage length in excess of 700 feet. **Bold** indicates 95th percentile queues exceeding the storage length.

Overall, the project-generated trips have no significant impacts on 95th percentile queues in both the weekday p.m. peak hour and weekend midday peak hour cumulative plus project scenario. In order to manage queue lengths in the future it is suggested that the impacted intersections be monitored, and potential mitigations such as signal timing adjustments or turn lane extensions be considered as appropriate to manage intersection queuing. *Appendix "F" includes the intersection queue analysis worksheets for each of the scenarios.*

PARKING EVALUTION

KAI evaluated the current and projected future parking conditions at the Costco site as they related to the proposed expansion to the Costco Gasoline fuel station.

Existing Parking Conditions

Existing parking conditions at the Concord Costco site (including relevant adjacent parcels) were inventoried and observed during the weekday p.m. and weekend midday peak demand periods to identify the existing parking supply and demand. This evaluation included a review of existing parking inventories, peak hour occupancy, parking conditions, and the physical layout of existing parking facilities. The focus of the parking analysis was to inventory parking on the site, including the number of parking spaces available and to obtain peak period parking occupancy counts to determine the current utilization of parking supply. To collect the parking data, the existing Concord Costco site was divided into seven zones (as illustrated in Figure 16) for ease of data collection, documentation, and refined analysis.

Existing Parking Supply Inventory

An inventory of existing parking supply was determined from on-site parking space counts during November 2014. All spaces were identified by location. Under existing conditions, no designated on-street parking is permitted for the Costco development and all parking is contained on the site and in a designated employee parking lot across Detroit Avenue. designated for employee/overflow parking.

Table 14 summarizes the existing parking inventory within the study area by designated parking zone. There are a total of 944 existing parking spaces, with 782 of those spaces specifically located on the Costco site. Zone 1 is an employee/overflow parking area consisting of 162 spaces and is located east of the warehouse across the street on Detroit Avenue. This parking lot is leased to Costco and is designated for employee/overflow parking.

Table 14. Existing Parking Supply

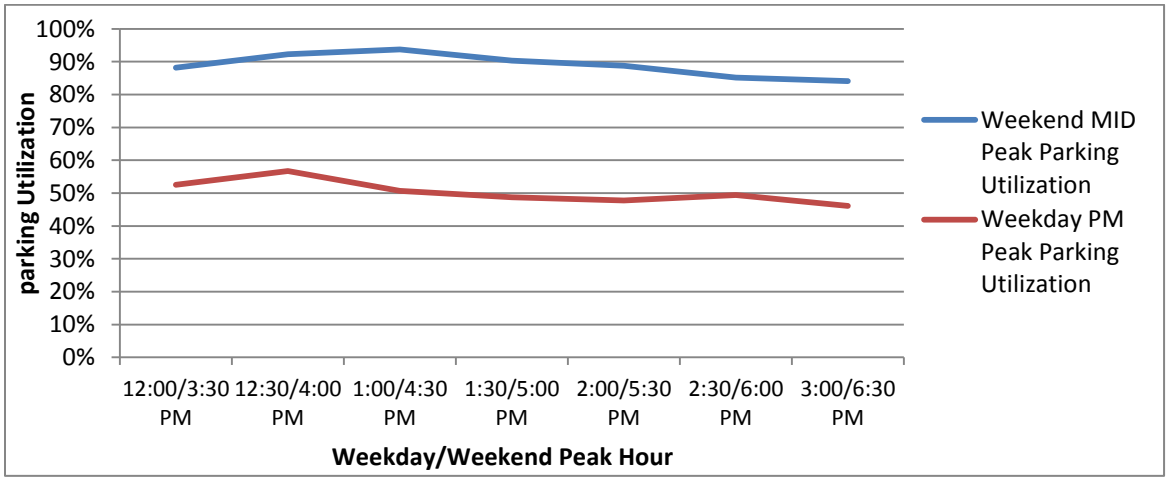
Study Parking Zone	Parking Supply
1[1]	162
2	106
3[2]	135
4	80
5[3]	160
6	279
7	22
Total	**944**

Notes: [1] Employees are encouraged to park in Zone 1, located on an adjacent parcel east of the warehouse on Detroit Avenue; [2] Parking supply includes nine handicap spaces and 16 spaces in front of the tire center; [3] Parking supply includes 10 handicap spaces.

Existing Parking Occupancy

Parking occupancy measures the level of use of the parking supply during a given time period. It is typically expressed in terms of a percentage of parking supply. To evaluate existing parking occupancy rates at the Concord Costco site, parking demand counts were conducted in November 2014. Both the weekday p.m. peak period (3:30 p.m. to 6:30 p.m.) and the weekend midday peak period (12:00 p.m. to 3:00 p.m.) were counted at half-hour intervals. These peak periods were identified for evaluation based on known trip generation characteristics and peaking characteristics at Costco warehouses. Trip generation characteristics at Costco warehouses and the parking counts for this site indicated that the weekend peak period experienced the highest parking demand and was the critical time period for the parking needs evaluation. Figure 15 illustrates the parking utilization during the weekend midday and weekday p.m. peak period.

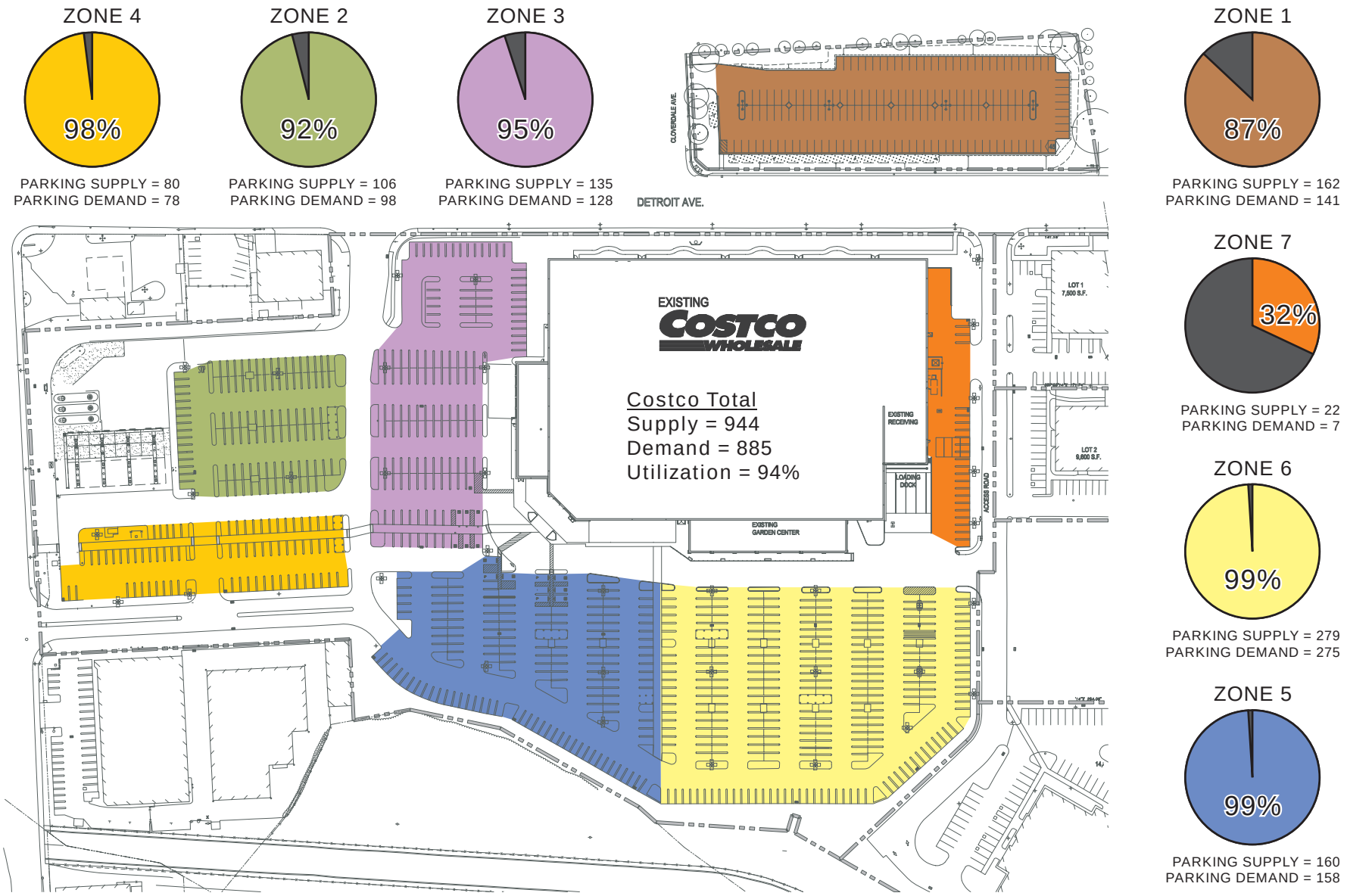
Figure 15. Concord Costco Parking Utilization



From the parking data collected, it was determined that the peak half-hour of parking demand during occurred during the weekend midday peak period from 1:00 to 1:30 p.m. when 94% of total parking spaces on site were occupied. The peak half-hour for parking demand coincides with the midday peak hour, occurring from 1:05 p.m. to 2:05 p.m. Figure 16 provides a graphical summary of the parking occupancy in each of the Costco site parking zones during the midday peak half-hour.

As summarized in Figure 16, the site parking in total was 94% occupied during the critical weekend peak half-hour. During the three hour weekend midday peak period, the site was 89% occupied overall. Throughout the peak period parking zone occupancy rates varied within the site. As expected, the parking spaces closest to the Costco warehouse entrance (Zones 3, 5, and 6) were heavily occupied, while the spaces in the farther corners of the parking lot had lower utilization.

Zones 3, 5, and 6 which are located nearest the Costco warehouse entrance were the most heavily utilized zones with an average utilization of 92% during the weekend peak period and 97% utilization during the weekend midday peak half-hour. Parking zones on the remainder of the site averaged 74% utilization during the weekend peak period and 74% during the peak half-hour.



Weekend Midday Peak Half-Hour Parking Demand
Concord, California

FIGURE 16

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In general, parking is considered to be "full" at approximately 90% occupancy, as described in the *ITE Parking Generation Manual*[5] (Reference 4). This is to allow for ease of circulation, parking availability, and to account for variations in parking turn-over. Therefore, under existing conditions, the site parking supply can be considered full during the peak half hour by these criteria with a limited margin for daily and seasonal fluctuations in parking demand.

Effects of Proposed Fuel Station Expansion on Parking

The site plan for the proposed gasoline expansion as seen in Figure 1 displays a net decrease of five parking spaces. These five parking spaces will be removed from Zone 4 and replaced with a water quality feature. Zone 4 had a utilization rate of 95% during the weekend peak half hour. The proposed fuel expansion would lower Zone 4 parking supply from 80 to 75 spaces.

While some parking spaces will be removed in Zone 4, it is a minimal 5 spaces and the parking currently using those stalls can be accommodated by parking available in underutilized parking zones closer to the Costco entrance or in other areas of the site.

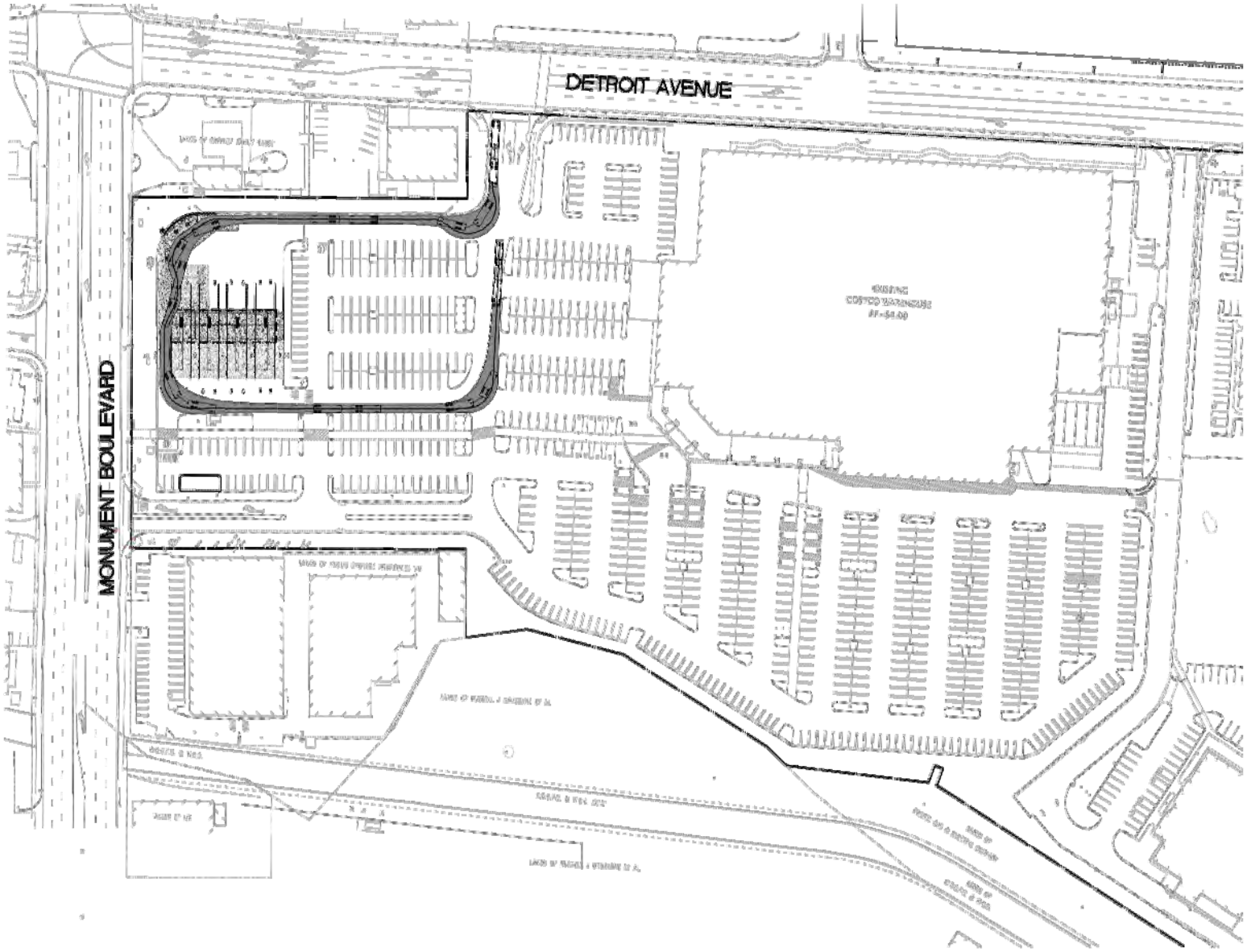
Given that parking demand under existing conditions is constrained during the weekend midday peak period and only a minimal amount of spaces will be reduced (5 spaces out of a total of 944 on site), it can be concluded that there will still be sufficient parking on site to accommodate the proposed fuel station expansion. It is not anticipated that the fuel station expansion project will significantly increase or noticeably change parking demand on the site. However, even if parking demand does increase, there is still 6% reserve capacity during the weekend peak half-hour (or approximately 57 spaces) to accommodate a fluctuation in parking demand.

FUEL STATION ACCESS, CIRCULATION, AND QUEUING

The Concord Costco site has three site access points. One full access exists on Detroit Avenue and two stop-controlled accesses, one with access to eastbound Monument Boulevard and to the south of the site with access to the Southern Access Road and Detroit Avenue. The fuel station can be accessed by any of the site driveways; however, the full movement access on Detroit Avenue is closest to the gasoline station entrance.

Gasoline fuel tanker trucks will access the gasoline station through the full access intersection on Detroit Avenue. As illustrated in Figure 17, gasoline trucks truck turning movements are accommodated throughout the fuel station area and surrounding parking zones. After refilling the Costco Gasoline tanks, trucks will exit the site at the full access at Detroit Avenue. It is also important to note that the fuel truck delivery can occur without disruption to the on-going operations of the fuel station.

[5] Institute of Transportation Engineers. *ITE Parking Generation Manual, 4th Edition*, Washington, D.C., 2010.



Gasoline Delivery Truck Circulation
Concord, California

FIGURE
17

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The fuel pumps can remain operational during fuel delivery and the fuel delivery area has been designed to occur at the far north end of the fuel station area out of the way of the fuel pumps and queuing area behind the pumps. In addition, the fuel station attendants on site are trained to guide and direct the fuel delivery process during fuel station operations and ensure it occurs with minimal disruptions to the standard operations of the fuel station.

Existing Fuel Station Queuing and Operations

Queuing and operations at the existing Concord Costco Gasoline fuel station were evaluated to establish a baseline for comparison with the implementation of the proposed 24-station fueling position station upon expansion. Video data was collected at the fuel station during the weekday p.m. peak period (4:00 p.m. to 7:00 p.m.) and the weekend midday peak period (11:00 a.m. to 3:00 p.m.) in July 2013 to document existing fuel station queues. Maximum, minimum, average, and 95th percentile queues were identified for the peak hour observed. The queuing data summary of the peak hour observations (based on trip generation) are presented. Although trip generation is highest during the peak hour, observations of queuing may be higher for the peak period depending on given characteristics, such as pump time and efficiency of queue management, that occur. Table 15 shows the existing queues observed at the fuel station. Queue length totals include vehicles at the fuel pumps which accommodate 16 vehicles under existing conditions.

Table 15. Existing Concord Costco Gasoline Facility Queues

Queue Lengths[1]	Weekday PM Peak Hour Queue[2]	Weekend Midday Peak Hour Queue[2]
Average Queue	38	46
Minimum Queue	22	35
Maximum Queue	54	57
95th Percentile Queue	51	53

Notes: [1] Queue length is total number of vehicles waiting in line behind the pumps, as well as vehicles at the pumps (existing conditions include 16 fuel pumps); [2] Peak hour is summary data only for highest hour of trip generation within the peak period.

As shown in Table 15, queues at the fuel station were longer during the weekend midday peak period than during the weekday p.m. peak period. The average queue during the weekend midday peak hour was 8 vehicles longer than during the weekday p.m. peak hour. The maximum queue observed during any time period was 57 vehicles which occurred during the weekend midday peak hour. Existing 95th percentile queues at the fuel facility during the weekend midday peak hour are illustrated in Figure 1818.

Costco does not maintain or identify specific targets for the maximum length of queue they wish to maintain for members at their fuel stations. However, they do seek to maintain operations at a level where members' inconvenience and complaints are minimized and where queuing from the fuel station does not interfere with circulation and operations in the parking field or in other areas of the site. Consistent with this, the main objective of the proposed fuel station expansion is to improve operations and reduce queuing and wait times for the existing members who visit the Concord Costco location.

LEGEND

- VEHICLE IN QUEUE

Existing 95th Percentile Queue
Weekend Midday Peak Hour
Concord, California

FIGURE **18**

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Fuel Station Queue Mitigation Strategy

The Concord Costco gasoline fueling station expansion will increase capacity by 50% with the addition of the proposed eight fuel station pumps, raising its total from 16 fuel station pumps to 24. As seen in Figure 18, 95th percentile queues during the weekend midday peak hour currently exceed queue storage for the gasoline fueling station. With the implementation of the proposed fuel station expansion 95th percentile queues are estimated to decrease by approximately 35% and 13% during the weekday p.m. and weekend midday peak hours, respectively.

The estimated reduction in queue lengths is based on existing Costco data. Data collected at other Costco Gasoline locations that increased fuel station capacity from 16 existing fuel stations to 20+ fuel stations was used. Table 16 shows the expected queue lengths at the Concord Costco gasoline station when 24 fueling stations are in place. The 95th percentile queue lengths are estimated to reduce from 51 to 33 vehicles during the weekday p.m. peak hour and from 53 to 46 vehicles during the weekend midday peak hour. Figure 19 illustrates the estimated 95th percentile queue length at the Concord Costco gasoline station with the 24 fueling stations in place. As seen in Figure 19, the addition of the eight fueling stations is estimated to reduce vehicle queues to within the designated queuing area during the weekend midday peak hour.

Table 16. Estimated Queue Lengths with Proposed Gasoline Expansion

Queue Lengths[1]	Weekday PM Peak Hour Queue[2]	Weekend Midday Peak Hour Queue[2]
Average Queue	25	38
Minimum Queue	<24	27
Maximum Queue	37	49
95th Percentile Queue	33	46

Notes: [1] Queue length is total number of vehicles waiting in line behind the pumps, as well as vehicles at the pumps (assuming implementation of proposed 24 pump fueling station); [2] Peak hour is summary data only for highest hour of trip generation within the peak period.

LEGEND

- VEHILCE IN QUEUE

Estimated 95th Percentile Queue with Gasoline Expansion
Weekend Midday Peak Hour
Concord, California

FIGURE 19

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TRANSPORTATION ENGINEERING / PLANNING

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Section 5
Findings

FINDINGS

The results of the traffic impact analysis indicate that the proposed Costco Gasoline fuel station expansion can be constructed while maintaining acceptable levels of service and safety on the surrounding transportation system. The findings of this analysis and our recommendations are discussed below.

Existing Conditions

- All of the study intersections operate at acceptable levels of service during the weekday p.m. and weekend midday peak hours.

Proposed Development Plan

- The proposed gasoline fuel station expansion will include eight new fuel pump stations, increasing capacity 50% from 16 fuel pump stations to 24 fuel pump stations.
- The proposed fuel station expansion is estimated to generate 250 daily net new trips during the week and 220 daily net new trips during the weekend.
    - 20 net new trips (10 inbound, 10 outbound) are projected to occur during the weekday p.m. peak and weekend midday peak hours.
    - 25 net new trips (15 inbound, 10 outbound) are projected to occur during the weekend midday peak hour.

Existing Plus Project Traffic Conditions

- All of the study intersections, and site access points, are forecast to operate with acceptable levels of service during the weekday p.m. and weekend midday peak hours under existing plus project conditions.

Year 2040 Cumulative Traffic Conditions

There were two intersections operating below the City of Concord's level of service standards in the cumulative conditions.

- Monument Boulevard/Costco Driveway
    - Operates at LOS "E" with an average delay of 47.2 seconds per vehicle and a volume-to-capacity ratio of 0.83 during the weekend midday peak hour.

- Monument Boulevard/Detroit Avenue
  - Operates at LOS "E" with an average delay of 62.0 seconds per vehicle and a volume-to-capacity ratio of 0.87 during the weekday p.m. peak hour.
  - Operates at LOS "F" with an average delay of 81.4 seconds per vehicle and a volume-to-capacity ratio of 0.97 during the weekend midday peak hour.

Year 2040 Cumulative Plus Project Traffic Conditions

- Project-generated traffic does not have a significant impact at any of the study intersections during the weekday p.m. and weekend midday peak hour under the cumulative plus project scenario.
- The effects of project-generated traffic at the intersections affected in the cumulative scenario are described below:
  - Monument Boulevard/Costco Driveway – Operates at LOS "E" during the weekend midday peak hour, project-generated traffic increases delay by 2.9 seconds;
  - Monument Boulevard/Detroit Avenue – Operates at LOS "E" during the weekday p.m. peak hour, project-generated traffic increases delay by 0.6 seconds; and
  - Monument Boulevard/Detroit Avenue – Operates at LOS "F" during the weekend midday peak hour, project-generated traffic increases delay by 0.3 seconds.

Intersection Queuing Analysis

KAI looked at the impact of the project-generated trips on 95th percentile queue lengths at each study intersection in both existing and cumulative scenarios.

- No site driveways exceed their queue storage in the existing, existing plus project, cumulative, or cumulative plus project scenarios.
- Two intersections have 95th percentile queues exceeding their storage length in the existing scenario:
  - Monument Boulevard/Detroit Avenue - northbound left queue exceeds storage by 200 feet and 100 feet during the weekend midday and weekday p.m. peak hours, respectively. The eastbound left queue exceeds storage by 175 feet and 150 feet during the weekend midday and weekday p.m. peak hours, respectively.
  - Monument Boulevard/Cowell Road - eastbound right queue exceeds storage by 25 feet during the weekday p.m. peak hour and northbound left southbound left queues exceed storage by 25 feet and 35 feet, respectively during the weekday p.m. and weekend midday peak hour.

- Project-generated traffic analyzed in the existing plus project scenario does not increase queue lengths at any of the study in study intersections during the weekday p.m. or weekend midday day peak hours.
- Three intersections have 95th percentile queues exceeding their storage length in the cumulative scenario.
  - Monument Boulevard/Oak Grove Road - northbound left queue exceeds storage by 25 feet during the weekend midday day peak hour.
  - Monument Boulevard/Detroit Avenue - northbound left queue exceeds storage by 175 feet and 325 feet during the weekday p.m. and weekend midday peak hours, respectively. The eastbound left exceeds queues storage by 300 feet during the weekday p.m. and weekend midday peak hours.
  - Monument Boulevard/Cowell Road - eastbound right queues exceed storage by 100 feet and 50 feet during the weekday p.m. peak hour and weekend peak hour respectively. Northbound left and southbound left queues exceed queue storage by 50 feet and 35 feet, respectively during the weekday p.m. and weekend midday peak hour. The westbound left exceeds queue storage by 100 feet during the weekday p.m. peak period.
- Project-generated traffic analyzed in the cumulative plus project scenario does not increase queue lengths at any of the study in study intersections during the weekday p.m. or weekend midday day peak hours.

Fuel Station Access, Circulation, and Queues

- The fuel station is accessible from any of the site driveways; however, the full access intersection at Detroit Avenue is closest to the vehicle queues for the fuel station.
- All gasoline fuel delivery tankers will enter and exit the site at the full access intersection on Detroit Avenue.
  - There is sufficient turning movement area throughout the fuel station and parking zones to accommodate the maneuverability of fuel delivery tankers.
  - Fuel station can remain in operation while fuel delivery occurs.
- With the expansion of the fuel station, fuel station queues are estimated to decrease.
  - 95th percentile queue lengths are estimated to decrease by approximately 35% during the weekday p.m. peak period.
  - 95th percentile queue lengths are estimated to decrease by approximately 13% during the weekend midday peak hour, resulting in queues contained within the fuel station's queuing area.

Section 6
References

REFERENCES

1. City of Concord. *Concord 2030 General Plan:* Volume I: Plan Policies, Concord, California, 2012.

2. Transportation Research Board. *Highway Capacity Manual*, Washington, D.C., 2000.

3. DKS Associates. *Contra Costa Transportation Authority Final Technical Procedures,* Concord, California, January 2013.

4. Institute of Transportation Engineers. *ITE Parking Generation Manual, 4th Edition*, Washington, D.C., 2010.

Appendix A Level of Service Operation Description

LEVEL OF SERVICE OPERATION DESCRIPTION

Level of service (LOS) is a concept developed to quantify the degree of comfort (including such elements as travel time, number of stops, total amount of stopped delay, and impediments caused by other vehicles) afforded to drivers as they travel through an intersection or roadway segment. Six grades are used to denote the various level of service from “A” to “F”.

SIGNALIZED INTERSECTIONS

The six level of service grades are described qualitatively for signalized intersections in Table A-1. Additionally, Table A-2 identifies the relationship between level of service and average control delay per vehicle. Control delay is defined to include initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay. Using this definition, Level of Service “D” is generally considered to represent the minimum acceptable design standard.

Table A-1. Level of Service Definitions (Signalized Intersections)

Level of Service	Average Delay per Vehicle
A	Very low average control delay, less than 10 seconds per vehicle. This occurs when progression is extremely favorable, and most vehicles arrive during the green phase. Most vehicles do not stop at all. Short cycle lengths may also contribute to low delay.
B	Average control delay is greater than 10 seconds per vehicle and less than or equal to 20 seconds per vehicle. This generally occurs with good progression and/or short cycle lengths. More vehicles stop than for a level of service A, causing higher levels of average delay.
C	Average control delay is greater than 20 seconds per vehicle and less than or equal to 35 seconds per vehicle. These higher delays may result from fair progression and/or longer cycle lengths. Individual cycle failures may begin to appear at this level. The number of vehicles stopping is significant at this level, although many still pass through the intersection without stopping.
D	Average control delay is greater than 35 seconds per vehicle and less than or equal to 55 seconds per vehicle. The influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavorable progression, long cycle length, or high volume/capacity ratios. Many vehicles stop, and the proportion of vehicles not stopping declines. Individual cycle failures are noticeable.
E	Average control delay is greater than 55 seconds per vehicle and less than or equal to 80 seconds per vehicle. This is usually considered to be the limit of acceptable delay. These high delay values generally (but not always) indicate poor progression, long cycle lengths, and high volume/capacity ratios. Individual cycle failures are frequent occurrences.
F	Average control delay is in excess of 80 seconds per vehicle. This is considered to be unacceptable to most drivers. This condition often occurs with oversaturation. It may also occur at high volume/capacity ratios below 1.0 with many individual cycle failures. Poor progression and long cycle lengths may also contribute to such high delay values.

Note: Most of the material in this appendix is adapted from the Transportation Research Board, Highway Capacity Manual, (2000).

Table A-2. Level of Service Criteria for Signalized Intersections

Level of Service	Average Control Delay per Vehicle (Seconds)
A	<10.0
B	>10 and ≤20
C	>20 and ≤35
D	>35 and ≤55
E	>55 and ≤80
F	>80

UNSIGNALIZED INTERSECTIONS

Unsignalized intersections include two-way stop-controlled (TWSC) and all-way stop-controlled (AWSC) intersections. The *2000 Highway Capacity Manual* (HCM) provides models for estimating control delay at both TWSC and AWSC intersections. A qualitative description of the various service levels associated with an unsignalized intersection is presented in Table A-3. A quantitative definition of level of service for unsignalized intersections is presented in Table A-4. Using this definition, LOS "E" is generally considered to represent the minimum acceptable design standard.

Table A-3. Level of Service Criteria for Unsignalized Intersections

Level of Service	Average Delay per Vehicle to Minor Street
A	• Nearly all drivers find freedom of operation. • Very seldom is there more than one vehicle in queue.
B	• Some drivers begin to consider the delay an inconvenience. • Occasionally there is more than one vehicle in queue.
C	• Many times there is more than one vehicle in queue. • Most drivers feel restricted, but not objectionably so.
D	• Often there is more than one vehicle in queue. • Drivers feel quite restricted.
E	• Represents a condition in which the demand is near or equal to the probable maximum number of vehicles that can be accommodated by the movement. • There is almost always more than one vehicle in queue. • Drivers find the delays approaching intolerable levels.
F	• Forced flow. • Represents an intersection failure condition that is caused by geometric and/or operational constraints external to the intersection.

Table A-4. Level of Service Criteria for Unsignalized Intersections

Level of Service	Average Control Delay per Vehicle (Seconds)
A	<10.0
B	>10.0 and ≤ 15.0
C	>15.0 and ≤ 25.0
D	>25.0 and ≤ 35.0
E	>35.0 and ≤ 50.0
F	>50.0

It should be noted that the level-of-service criteria for unsignalized intersections are somewhat different than the criteria used for signalized intersections. The primary reason for this difference is that drivers expect different levels of performance from different kinds of transportation facilities. The expectation is that a signalized intersection is designed to carry higher traffic volumes than an unsignalized intersection. Additionally, there are a number of driver behavior considerations that combine to make delays at signalized intersections less galling than at unsignalized intersections. For example, drivers at signalized intersections are able to relax during the red interval, while drivers on the minor street approaches to TWSC intersections must remain attentive to the task of identifying acceptable gaps and vehicle conflicts. Also, there is often much more variability in the amount of delay experienced by individual drivers at unsignalized intersections than signalized intersections. For these reasons, it is considered that the control delay threshold for any given level of service is less for an unsignalized intersection than for a signalized intersection. While overall intersection level of service is calculated for AWSC intersections, level of service is only calculated for the minor approaches and the major street left turn movements at TWSC intersections. No delay is assumed to the major street through movements. For TWSC intersections, the overall intersection level of service remains undefined: level of service is only calculated for each minor street lane.

In the performance evaluation of TWSC intersections, it is important to consider other measures of effectiveness (MOEs) in addition to delay, such as v/c ratios for individual movements, average queue lengths, and 95th-percentile queue lengths. By focusing on a single MOE for the worst movement only, such as delay for the minor-street left turn, users may make inappropriate traffic control decisions. The potential for making such inappropriate decisions is likely to be particularly pronounced when the HCM level of service thresholds are adopted as legal standards, as is the case in many public agencies.

Appendix B Existing Conditions Traffic Operation Worksheets

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	130	914	193	219	802	134	244	328	211	168	347	117
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.0	5.0	4.0	5.0		4.0	5.0		4.0	5.0	5.0
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91		0.97	0.95		0.97	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.95	1.00	1.00		1.00	0.99		1.00	1.00	0.95
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.98		1.00	0.94		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3502	5036	1491	3502	4954		3433	3305		3433	3574	1513
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3502	5036	1491	3502	4954		3433	3305		3433	3574	1513
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	138	972	205	233	853	143	260	349	224	179	369	124
RTOR Reduction (vph)	0	0	103	0	14	0	0	92	0	0	0	105
Lane Group Flow (vph)	138	972	102	233	982	0	260	481	0	179	369	19
Confl. Peds. (#/hr)	15		30	30		15	38		19	19		38
Heavy Vehicles (%)	0%	3%	3%	0%	2%	2%	2%	1%	2%	2%	1%	1%
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA		Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2									4
Actuated Green, G (s)	17.9	64.5	64.5	13.0	59.6		14.2	23.3		11.2	20.3	20.3
Effective Green, g (s)	17.9	64.5	64.5	13.0	59.6		14.2	23.3		11.2	20.3	20.3
Actuated g/C Ratio	0.14	0.50	0.50	0.10	0.46		0.11	0.18		0.09	0.16	0.16
Clearance Time (s)	4.0	5.0	5.0	4.0	5.0		4.0	5.0		4.0	5.0	5.0
Vehicle Extension (s)	2.0	3.0	3.0	2.0	3.0		2.0	2.0		2.0	2.0	2.0
Lane Grp Cap (vph)	482	2498	739	350	2271		374	592		295	558	236
v/s Ratio Prot	0.04	c0.19		c0.07	c0.20		c0.08	c0.15		0.05	0.10	
v/s Ratio Perm			0.07									0.01
v/c Ratio	0.29	0.39	0.14	0.67	0.43		0.70	0.81		0.61	0.66	0.08
Uniform Delay, d1	50.3	20.4	17.7	56.4	23.8		55.8	51.3		57.3	51.6	46.9
Progression Factor	1.00	1.00	1.00	0.78	0.85		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.1	0.5	0.4	2.9	0.5		4.5	7.9		2.4	2.3	0.1
Delay (s)	50.4	20.9	18.1	47.2	20.7		60.3	59.2		59.7	53.9	46.9
Level of Service	D	C	B	D	C		E	E		E	D	D
Approach Delay (s)		23.6			25.7			59.5			54.2	
Approach LOS		C			C			E			D	

Intersection Summary			
HCM 2000 Control Delay	36.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	77.7%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	1145	278	0	1146	0	168
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Hourly flow rate (vph)	1301	316	0	1302	0	191
Pedestrians					23	
Lane Width (ft)					12.0	
Walking Speed (ft/s)					4.0	
Percent Blockage					2	
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)				624		
pX, platoon unblocked					0.88	
vC, conflicting volume			1640		1916	615
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1640		1564	615
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	56
cM capacity (veh/h)			393		90	431

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1
Volume Total	520	520	576	434	434	434	191
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	316	0	0	0	191
cSH	1700	1700	1700	1700	1700	1700	431
Volume to Capacity	0.31	0.31	0.34	0.26	0.26	0.26	0.44
Queue Length 95th (ft)	0	0	0	0	0	0	56
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	19.8
Lane LOS							C
Approach Delay (s)	0.0			0.0			19.8
Approach LOS							C

Intersection Summary			
Average Delay	1.2		
Intersection Capacity Utilization	45.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	290	903	120	358	657	42	316	154	417	55	170	173
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.0		4.0	5.0		4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	1.00	0.91		0.97	0.95		0.95	0.95	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	0.98	1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.98		1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	0.98	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1787	5005		3467	3539		1681	1750	1569	1770	1900	1556
Flt Permitted	0.95	1.00		0.95	1.00		0.95	0.98	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1787	5005		3467	3539		1681	1750	1569	1770	1900	1556
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	315	982	130	389	714	46	343	167	453	60	185	188
RTOR Reduction (vph)	0	11	0	0	3	0	0	0	368	0	0	127
Lane Group Flow (vph)	315	1101	0	389	757	0	250	260	85	60	185	61
Confl. Peds. (#/hr)	1		16	16		1	10		5	5		10
Confl. Bikes (#/hr)												1
Heavy Vehicles (%)	1%	1%	4%	1%	1%	0%	2%	1%	1%	2%	0%	1%
Turn Type	Prot	NA		Prot	NA		Split	NA	Perm	Split	NA	Perm
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases									3			4
Actuated Green, G (s)	30.7	49.3		20.9	39.5		24.5	24.5	24.5	17.3	17.3	17.3
Effective Green, g (s)	30.7	49.3		20.9	39.5		24.5	24.5	24.5	17.3	17.3	17.3
Actuated g/C Ratio	0.24	0.38		0.16	0.30		0.19	0.19	0.19	0.13	0.13	0.13
Clearance Time (s)	4.0	5.0		4.0	5.0		4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	2.0	3.0		2.0	3.0		2.0	2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	422	1898		557	1075		316	329	295	235	252	207
v/s Ratio Prot	c0.18	0.22		0.11	c0.21		c0.15	0.15		0.03	c0.10	
v/s Ratio Perm									0.05			0.04
v/c Ratio	0.75	0.58		0.70	0.70		0.79	0.79	0.29	0.26	0.73	0.29
Uniform Delay, d1	46.0	32.1		51.6	40.1		50.3	50.3	45.3	50.6	54.1	50.8
Progression Factor	1.08	1.23		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	6.0	1.3		3.1	3.9		11.9	11.4	0.2	0.2	9.2	0.3
Delay (s)	55.8	40.6		54.7	43.9		62.2	61.7	45.5	50.8	63.3	51.1
Level of Service	E	D		D	D		E	E	D	D	E	D
Approach Delay (s)		44.0			47.6			54.2			56.3	
Approach LOS		D			D			D			E	

Intersection Summary			
HCM 2000 Control Delay	48.8	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	78.2%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	317	2	47	2	0	5	53	565	0	2	389	257
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5	4.5		4.5		4.0	5.0		4.0	5.0	
Lane Util. Factor		1.00	1.00		1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00	0.99		0.98		1.00	1.00		1.00	0.99	
Flpb, ped/bikes		1.00	1.00		1.00		1.00	1.00		0.92	1.00	
Frt		1.00	0.85		0.90		1.00	1.00		1.00	0.94	
Flt Protected		0.95	1.00		0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1792	1560		1654		1770	3505		1664	3275	
Flt Permitted		0.95	1.00		0.99		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1792	1560		1654		1770	3505		1664	3275	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	345	2	51	2	0	5	58	614	0	2	423	279
RTOR Reduction (vph)	0	0	36	0	7	0	0	0	0	0	74	0
Lane Group Flow (vph)	0	347	15	0	0	0	58	614	0	2	628	0
Confl. Peds. (#/hr)	1		3	3		1	11		6	6		11
Heavy Vehicles (%)	1%	0%	2%	0%	0%	0%	2%	3%	0%	0%	3%	1%
Turn Type	Split	NA	Perm	Split	NA		Prot	NA		Prot	NA	
Protected Phases	3	3		4	4		1	6		5	2	
Permitted Phases			3									
Actuated Green, G (s)		18.9	18.9		0.7		4.2	26.4		0.7	22.9	
Effective Green, g (s)		18.9	18.9		0.7		4.2	26.4		0.7	22.9	
Actuated g/C Ratio		0.29	0.29		0.01		0.06	0.41		0.01	0.35	
Clearance Time (s)		4.5	4.5		4.5		4.0	5.0		4.0	5.0	
Vehicle Extension (s)		2.0	2.0		2.0		2.0	3.0		2.0	3.0	
Lane Grp Cap (vph)		523	455		17		114	1430		18	1159	
v/s Ratio Prot		c0.19			c0.00		c0.03	c0.18		0.00	c0.19	
v/s Ratio Perm			0.01									
v/c Ratio		0.66	0.03		0.00		0.51	0.43		0.11	0.54	
Uniform Delay, d1		20.1	16.4		31.7		29.3	13.7		31.7	16.7	
Progression Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		2.5	0.0		0.0		1.3	0.2		1.0	0.5	
Delay (s)		22.6	16.4		31.7		30.6	14.0		32.7	17.2	
Level of Service		C	B		C		C	B		C	B	
Approach Delay (s)		21.8			31.7			15.4			17.3	
Approach LOS		C			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	17.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	64.7	Sum of lost time (s)	18.0
Intersection Capacity Utilization	60.0%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	86	80	63	532	403	35
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	97	90	71	598	453	39
Pedestrians	11			2	3	
Lane Width (ft)	12.0			12.0	12.0	
Walking Speed (ft/s)	4.0			4.0	4.0	
Percent Blockage	1			0	0	
Right turn flare (veh)						
Median type				TWLTL	TWLTL	
Median storage veh)				2	2	
Upstream signal (ft)					814	
pX, platoon unblocked	0.83	0.83	0.83			
vC, conflicting volume	907	466	503			
vC1, stage 1 conf vol	464					
vC2, stage 2 conf vol	443					
vCu, unblocked vol	788	257	302			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3	2.2			
p0 queue free %	80	85	93			
cM capacity (veh/h)	475	616	1047			

Direction, Lane #	EB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	187	71	299	299	453	39
Volume Left	97	71	0	0	0	0
Volume Right	90	0	0	0	0	39
cSH	534	1047	1700	1700	1700	1700
Volume to Capacity	0.35	0.07	0.18	0.18	0.27	0.02
Queue Length 95th (ft)	39	5	0	0	0	0
Control Delay (s)	15.3	8.7	0.0	0.0	0.0	0.0
Lane LOS	C	A				
Approach Delay (s)	15.3	0.9			0.0	
Approach LOS	C					

Intersection Summary			
Average Delay	2.6		
Intersection Capacity Utilization	44.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	1	15	14	84	151	3
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	1	17	16	94	170	3
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	110				82	63
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	110				82	63
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				82	100
cM capacity (veh/h)	1493				924	1007

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	18	110	173
Volume Left	1	0	170
Volume Right	0	94	3
cSH	1493	1700	926
Volume to Capacity	0.00	0.06	0.19
Queue Length 95th (ft)	0	0	17
Control Delay (s)	0.5	0.0	9.8
Lane LOS	A		A
Approach Delay (s)	0.5	0.0	9.8
Approach LOS			A

Intersection Summary			
Average Delay	5.6		
Intersection Capacity Utilization	21.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	56	745	387	552	590	57	290	78	259	40	56	16
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.0	5.0	4.0	5.0		4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95		0.95	0.95	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	0.99		1.00	1.00	0.97	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	0.97	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1805	3539	1599	3467	3477		1715	1747	1572	1805	1900	1587
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	0.97	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1805	3539	1599	3467	3477		1715	1747	1572	1805	1900	1587
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	61	810	421	600	641	62	315	85	282	43	61	17
RTOR Reduction (vph)	0	0	189	0	4	0	0	0	236	0	0	16
Lane Group Flow (vph)	61	810	232	600	699	0	198	202	46	43	61	1
Confl. Peds. (#/hr)	17					17	5		12	12		5
Confl. Bikes (#/hr)						1						
Heavy Vehicles (%)	0%	2%	1%	1%	2%	0%	0%	1%	0%	0%	0%	0%
Turn Type	Prot	NA	Perm	Prot	NA		Split	NA	Perm	Split	NA	Perm
Protected Phases	1	6		5	2		4	4		3	3	
Permitted Phases			6						4			3
Actuated Green, G (s)	7.4	43.0	43.0	23.9	59.5		18.1	18.1	18.1	7.0	7.0	7.0
Effective Green, g (s)	7.4	43.0	43.0	23.9	59.5		18.1	18.1	18.1	7.0	7.0	7.0
Actuated g/C Ratio	0.07	0.39	0.39	0.22	0.54		0.16	0.16	0.16	0.06	0.06	0.06
Clearance Time (s)	4.0	5.0	5.0	4.0	5.0		4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	2.0	3.0	3.0	2.0	3.0		2.0	2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	121	1383	625	753	1880		282	287	258	114	120	100
v/s Ratio Prot	0.03	c0.23		c0.17	0.20		0.12	c0.12		0.02	c0.03	
v/s Ratio Perm			0.14						0.03			0.00
v/c Ratio	0.50	0.59	0.37	0.80	0.37		0.70	0.70	0.18	0.38	0.51	0.01
Uniform Delay, d1	49.5	26.5	23.9	40.8	14.5		43.4	43.4	39.6	49.4	49.8	48.3
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.2	1.8	1.7	5.5	0.6		6.3	6.3	0.1	0.8	1.2	0.0
Delay (s)	50.7	28.3	25.5	46.2	15.1		49.7	49.7	39.7	50.2	51.1	48.3
Level of Service	D	C	C	D	B		D	D	D	D	D	D
Approach Delay (s)		28.5			29.4			45.6			50.4	
Approach LOS		C			C			D			D	

Intersection Summary			
HCM 2000 Control Delay	33.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	66.2%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	145	1039	213	181	1056	143	287	297	196	216	259	132
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.0	5.0	4.0	5.0		4.0	5.0		4.0	5.0	5.0
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91		0.97	0.95		0.97	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.95	1.00	1.00		1.00	0.99		1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.98		1.00	0.94		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3467	5085	1541	3502	4977		3467	3320		3467	3574	1520
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3467	5085	1541	3502	4977		3467	3320		3467	3574	1520
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	153	1094	224	191	1112	151	302	313	206	227	273	139
RTOR Reduction (vph)	0	0	110	0	10	0	0	107	0	0	0	120
Lane Group Flow (vph)	153	1094	114	191	1253	0	302	412	0	227	273	19
Confl. Peds. (#/hr)	5		28	28		5	18		16	16		18
Confl. Bikes (#/hr)			1			1						
Heavy Vehicles (%)	1%	2%	0%	0%	2%	3%	1%	1%	1%	1%	1%	3%
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA		Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2									4
Actuated Green, G (s)	12.7	63.4	63.4	11.2	61.9		15.1	19.9		12.5	17.3	17.3
Effective Green, g (s)	12.7	63.4	63.4	11.2	61.9		15.1	19.9		12.5	17.3	17.3
Actuated g/C Ratio	0.10	0.51	0.51	0.09	0.50		0.12	0.16		0.10	0.14	0.14
Clearance Time (s)	4.0	5.0	5.0	4.0	5.0		4.0	5.0		4.0	5.0	5.0
Vehicle Extension (s)	2.0	3.0	3.0	2.0	3.0		2.0	2.0		2.0	2.0	2.0
Lane Grp Cap (vph)	352	2579	781	313	2464		418	528		346	494	210
v/s Ratio Prot	0.04	c0.22		c0.05	c0.25		c0.09	c0.12		0.07	0.08	
v/s Ratio Perm			0.07									0.01
v/c Ratio	0.43	0.42	0.15	0.61	0.51		0.72	0.78		0.66	0.55	0.09
Uniform Delay, d1	52.8	19.3	16.4	54.8	21.3		52.9	50.5		54.2	50.2	47.0
Progression Factor	1.00	1.00	1.00	1.44	0.66		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.3	0.5	0.4	1.5	0.5		5.2	6.8		3.4	0.8	0.1
Delay (s)	53.1	19.9	16.8	80.2	14.5		58.1	57.3		57.6	51.0	47.1
Level of Service	D	B	B	F	B		E	E		E	D	D
Approach Delay (s)		22.8			23.2			57.6			52.5	
Approach LOS		C			C			E			D	

Intersection Summary			
HCM 2000 Control Delay	33.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	125.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	72.4%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	1024	422	0	1348	0	248
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	1101	454	0	1449	0	267
Pedestrians				1	11	
Lane Width (ft)				12.0	12.0	
Walking Speed (ft/s)				4.0	4.0	
Percent Blockage				0	1	
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)				624		
pX, platoon unblocked					0.86	
vC, conflicting volume			1566		1822	606
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1566		1392	606
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	39
cM capacity (veh/h)			423		116	441

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1
Volume Total	440	440	674	483	483	483	267
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	454	0	0	0	267
cSH	1700	1700	1700	1700	1700	1700	441
Volume to Capacity	0.26	0.26	0.40	0.28	0.28	0.28	0.61
Queue Length 95th (ft)	0	0	0	0	0	0	97
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	24.9
Lane LOS							C
Approach Delay (s)	0.0			0.0			24.9
Approach LOS							C

Intersection Summary			
Average Delay	2.0		
Intersection Capacity Utilization	51.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	306	792	174	348	699	50	469	148	326	46	173	180
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.0		4.0	5.0		4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	1.00	0.91		0.97	0.95		0.95	0.95	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	0.98	1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.97		1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	0.97	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	4977		3433	3527		1698	1741	1572	1687	1863	1519
Flt Permitted	0.95	1.00		0.95	1.00		0.95	0.97	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	4977		3433	3527		1698	1741	1572	1687	1863	1519
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	322	834	183	366	736	53	494	156	343	48	182	189
RTOR Reduction (vph)	0	24	0	0	4	0	0	0	268	0	0	137
Lane Group Flow (vph)	322	993	0	366	785	0	321	329	75	48	182	52
Confl. Peds. (#/hr)	6					6	15		2	2		15
Confl. Bikes (#/hr)			1						2			
Heavy Vehicles (%)	2%	1%	2%	2%	1%	2%	1%	1%	1%	7%	2%	3%
Turn Type	Prot	NA		Prot	NA		Split	NA	Perm	Split	NA	Perm
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases									3			4
Actuated Green, G (s)	31.4	42.9		20.1	31.6		27.2	27.2	27.2	16.8	16.8	16.8
Effective Green, g (s)	31.4	42.9		20.1	31.6		27.2	27.2	27.2	16.8	16.8	16.8
Actuated g/C Ratio	0.25	0.34		0.16	0.25		0.22	0.22	0.22	0.13	0.13	0.13
Clearance Time (s)	4.0	5.0		4.0	5.0		4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	2.0	3.0		2.0	3.0		2.0	2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	444	1708		552	891		369	378	342	226	250	204
v/s Ratio Prot	c0.18	0.20		0.11	c0.22		c0.19	0.19		0.03	c0.10	
v/s Ratio Perm									0.05			0.03
v/c Ratio	0.73	0.58		0.66	0.88		0.87	0.87	0.22	0.21	0.73	0.26
Uniform Delay, d1	42.9	33.7		49.3	44.9		47.2	47.2	40.2	48.2	51.9	48.5
Progression Factor	0.87	0.82		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	4.7	1.4		2.3	12.2		18.5	18.6	0.1	0.2	8.6	0.2
Delay (s)	42.2	28.8		51.6	57.1		65.7	65.8	40.3	48.4	60.5	48.7
Level of Service	D	C		D	E		E	E	D	D	E	D
Approach Delay (s)		32.1			55.4			57.0			53.8	
Approach LOS		C			E			E			D	

Intersection Summary			
HCM 2000 Control Delay	47.6	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	125.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	85.2%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	426	1	58	2	1	6	66	511	2	16	355	324
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5	4.5		4.5		4.0	5.0		4.0	5.0	
Lane Util. Factor		1.00	1.00		1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00	0.98		1.00		1.00	1.00		1.00	0.98	
Flpb, ped/bikes		1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Frt		1.00	0.85		0.91		1.00	1.00		1.00	0.93	
Flt Protected		0.95	1.00		0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1792	1582		1708		1805	3537		1703	3218	
Flt Permitted		0.95	1.00		0.99		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1792	1582		1708		1805	3537		1703	3218	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	453	1	62	2	1	6	70	544	2	17	378	345
RTOR Reduction (vph)	0	0	41	0	6	0	0	0	0	0	124	0
Lane Group Flow (vph)	0	454	21	0	3	0	70	546	0	17	599	0
Confl. Peds. (#/hr)			8	8			6		3	3		6
Confl. Bikes (#/hr)									1			2
Heavy Vehicles (%)	1%	0%	0%	0%	0%	0%	0%	2%	0%	6%	4%	1%
Turn Type	Split	NA	Perm	Split	NA		Prot	NA		Prot	NA	
Protected Phases	3	3		4	4		1	6		5	2	
Permitted Phases			3									
Actuated Green, G (s)		24.8	24.8		0.7		6.2	28.5		1.8	24.1	
Effective Green, g (s)		24.8	24.8		0.7		6.2	28.5		1.8	24.1	
Actuated g/C Ratio		0.34	0.34		0.01		0.08	0.39		0.02	0.33	
Clearance Time (s)		4.5	4.5		4.5		4.0	5.0		4.0	5.0	
Vehicle Extension (s)		2.0	2.0		2.0		2.0	3.0		2.0	3.0	
Lane Grp Cap (vph)		602	531		16		151	1365		41	1050	
v/s Ratio Prot		c0.25			c0.00		c0.04	0.15		0.01	c0.19	
v/s Ratio Perm			0.01									
v/c Ratio		0.75	0.04		0.19		0.46	0.40		0.41	0.57	
Uniform Delay, d1		21.8	16.5		36.3		32.2	16.4		35.5	20.6	
Progression Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		4.7	0.0		2.1		0.8	0.2		2.5	0.8	
Delay (s)		26.5	16.5		38.4		33.0	16.6		37.9	21.3	
Level of Service		C	B		D		C	B		D	C	
Approach Delay (s)		25.3			38.4			18.5			21.7	
Approach LOS		C			D			B			C	

Intersection Summary			
HCM 2000 Control Delay	21.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	73.8	Sum of lost time (s)	18.0
Intersection Capacity Utilization	67.1%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	152	92	76	427	345	70
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	162	98	81	454	367	74
Pedestrians	2			1		
Lane Width (ft)	12.0			12.0		
Walking Speed (ft/s)	4.0			4.0		
Percent Blockage	0			0		
Right turn flare (veh)						
Median type				TWLTL	TWLTL	
Median storage veh)				2	2	
Upstream signal (ft)					814	
pX, platoon unblocked	0.87	0.87	0.87			
vC, conflicting volume	758	370	443			
vC1, stage 1 conf vol	369					
vC2, stage 2 conf vol	389					
vCu, unblocked vol	646	199	284			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3	2.2			
p0 queue free %	70	86	93			
cM capacity (veh/h)	532	706	1119			

Direction, Lane #	EB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	260	81	227	227	367	74
Volume Left	162	81	0	0	0	0
Volume Right	98	0	0	0	0	74
cSH	586	1119	1700	1700	1700	1700
Volume to Capacity	0.44	0.07	0.13	0.13	0.22	0.04
Queue Length 95th (ft)	56	6	0	0	0	0
Control Delay (s)	15.9	8.5	0.0	0.0	0.0	0.0
Lane LOS	C	A				
Approach Delay (s)	15.9	1.3			0.0	
Approach LOS	C					

Intersection Summary			
Average Delay	3.9		
Intersection Capacity Utilization	46.5%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	0	2	2	144	242	2
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84
Hourly flow rate (vph)	0	2	2	171	288	2
Pedestrians			2			
Lane Width (ft)			12.0			
Walking Speed (ft/s)			4.0			
Percent Blockage			0			
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	174				92	88
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	174				92	88
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				68	100
cM capacity (veh/h)	1415				911	976

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	2	174	290
Volume Left	0	0	288
Volume Right	0	171	2
cSH	1415	1700	911
Volume to Capacity	0.00	0.10	0.32
Queue Length 95th (ft)	0	0	34
Control Delay (s)	0.0	0.0	10.8
Lane LOS			B
Approach Delay (s)	0.0	0.0	10.8
Approach LOS			B

Intersection Summary			
Average Delay	6.7		
Intersection Capacity Utilization	29.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	51	708	309	353	533	37	350	34	397	38	39	31
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.0	5.0	4.0	5.0		4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95		0.95	0.95	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00		1.00	1.00	0.97	1.00	1.00	0.95
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	0.96	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1805	3574	1594	3467	3526		1698	1719	1555	1719	1900	1531
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	0.96	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1805	3574	1594	3467	3526		1698	1719	1555	1719	1900	1531
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	53	738	322	368	555	39	365	35	414	40	41	32
RTOR Reduction (vph)	0	0	140	0	3	0	0	0	343	0	0	30
Lane Group Flow (vph)	53	738	182	368	591	0	201	199	71	40	41	2
Confl. Peds. (#/hr)	16		1	1		16	37		12	12		37
Confl. Bikes (#/hr)						2			1			
Heavy Vehicles (%)	0%	1%	0%	1%	1%	0%	1%	0%	1%	5%	0%	0%
Turn Type	Prot	NA	Perm	Prot	NA		Split	NA	Perm	Split	NA	Perm
Protected Phases	1	6		5	2		4	4		3	3	
Permitted Phases			6						4			3
Actuated Green, G (s)	7.2	51.0	51.0	15.9	59.7		18.9	18.9	18.9	6.2	6.2	6.2
Effective Green, g (s)	7.2	51.0	51.0	15.9	59.7		18.9	18.9	18.9	6.2	6.2	6.2
Actuated g/C Ratio	0.07	0.46	0.46	0.14	0.54		0.17	0.17	0.17	0.06	0.06	0.06
Clearance Time (s)	4.0	5.0	5.0	4.0	5.0		4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	2.0	3.0	3.0	2.0	3.0		2.0	2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	118	1657	739	501	1913		291	295	267	96	107	86
v/s Ratio Prot	0.03	c0.21		c0.11	0.17		c0.12	0.12		c0.02	0.02	
v/s Ratio Perm			0.11						0.05			0.00
v/c Ratio	0.45	0.45	0.25	0.73	0.31		0.69	0.67	0.27	0.42	0.38	0.02
Uniform Delay, d1	49.5	19.9	17.9	45.0	13.8		42.8	42.7	39.5	50.2	50.1	49.0
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.0	0.9	0.8	4.8	0.4		5.6	4.7	0.2	1.1	0.8	0.0
Delay (s)	50.5	20.8	18.7	49.8	14.2		48.4	47.4	39.7	51.2	50.9	49.1
Level of Service	D	C	B	D	B		D	D	D	D	D	D
Approach Delay (s)		21.6			27.8			43.7			50.5	
Approach LOS		C			C			D			D	

Intersection Summary			
HCM 2000 Control Delay	30.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	79.1%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Appendix C Existing Plus Project Conditions Traffic Operations Worksheets

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	130	917	193	220	805	135	244	328	212	169	347	117
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.0	5.0	4.0	5.0		4.0	5.0		4.0	5.0	5.0
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91		0.97	0.95		0.97	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.95	1.00	1.00		1.00	0.99		1.00	1.00	0.95
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.98		1.00	0.94		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3502	5036	1491	3502	4954		3433	3304		3433	3574	1513
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3502	5036	1491	3502	4954		3433	3304		3433	3574	1513
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	138	976	205	234	856	144	260	349	226	180	369	124
RTOR Reduction (vph)	0	0	103	0	14	0	0	94	0	0	0	105
Lane Group Flow (vph)	138	976	102	234	986	0	260	481	0	180	369	19
Confl. Peds. (#/hr)			30			15			19			38
Heavy Vehicles (%)	0%	3%	3%	0%	2%	2%	2%	1%	2%	2%	1%	1%
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA		Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2									4
Actuated Green, G (s)	17.9	64.5	64.5	13.0	59.6		14.2	23.3		11.2	20.3	20.3
Effective Green, g (s)	17.9	64.5	64.5	13.0	59.6		14.2	23.3		11.2	20.3	20.3
Actuated g/C Ratio	0.14	0.50	0.50	0.10	0.46		0.11	0.18		0.09	0.16	0.16
Clearance Time (s)	4.0	5.0	5.0	4.0	5.0		4.0	5.0		4.0	5.0	5.0
Vehicle Extension (s)	2.0	3.0	3.0	2.0	3.0		2.0	2.0		2.0	2.0	2.0
Lane Grp Cap (vph)	482	2498	739	350	2271		374	592		295	558	236
v/s Ratio Prot	0.04	c0.19		c0.07	c0.20		c0.08	c0.15		0.05	0.10	
v/s Ratio Perm			0.07									0.01
v/c Ratio	0.29	0.39	0.14	0.67	0.43		0.70	0.81		0.61	0.66	0.08
Uniform Delay, d1	50.3	20.5	17.7	56.4	23.8		55.8	51.2		57.3	51.6	46.9
Progression Factor	1.00	1.00	1.00	0.79	0.84		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.1	0.5	0.4	2.9	0.5		4.5	7.9		2.6	2.3	0.1
Delay (s)	50.4	20.9	18.1	47.2	20.5		60.3	59.1		59.9	53.9	46.9
Level of Service	D	C	B	D	C		E	E		E	D	D
Approach Delay (s)		23.6			25.5			59.5			54.2	
Approach LOS		C			C			E			D	

Intersection Summary			
HCM 2000 Control Delay	36.6	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	77.7%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	1140	288	0	1151	0	173
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Hourly flow rate (vph)	1295	327	0	1308	0	197
Pedestrians					23	
Lane Width (ft)					12.0	
Walking Speed (ft/s)					4.0	
Percent Blockage					2	
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)				624		
pX, platoon unblocked					0.88	
vC, conflicting volume			1646		1918	618
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1646		1562	618
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	54
cM capacity (veh/h)			391		90	428

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1
Volume Total	518	518	586	436	436	436	197
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	327	0	0	0	197
cSH	1700	1700	1700	1700	1700	1700	428
Volume to Capacity	0.30	0.30	0.34	0.26	0.26	0.26	0.46
Queue Length 95th (ft)	0	0	0	0	0	0	59
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	20.3
Lane LOS							C
Approach Delay (s)	0.0			0.0			20.3
Approach LOS							C

Intersection Summary			
Average Delay	1.3		
Intersection Capacity Utilization	46.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	290	903	120	361	657	42	321	156	420	55	171	173
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.0		4.0	5.0		4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	1.00	0.91		0.97	0.95		0.95	0.95	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	0.98	1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.98		1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	0.98	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1787	5005		3467	3539		1681	1750	1569	1770	1900	1556
Flt Permitted	0.95	1.00		0.95	1.00		0.95	0.98	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1787	5005		3467	3539		1681	1750	1569	1770	1900	1556
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	315	982	130	392	714	46	349	170	457	60	186	188
RTOR Reduction (vph)	0	11	0	0	4	0	0	0	369	0	0	127
Lane Group Flow (vph)	315	1101	0	392	757	0	255	264	88	60	186	61
Confl. Peds. (#/hr)			16			1			5			10
Confl. Bikes (#/hr)												1
Heavy Vehicles (%)	1%	1%	4%	1%	1%	0%	2%	1%	1%	2%	0%	1%
Turn Type	Prot	NA		Prot	NA		Split	NA	Perm	Split	NA	Perm
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases									3			4
Actuated Green, G (s)	30.8	48.8		21.0	39.0		24.9	24.9	24.9	17.3	17.3	17.3
Effective Green, g (s)	30.8	48.8		21.0	39.0		24.9	24.9	24.9	17.3	17.3	17.3
Actuated g/C Ratio	0.24	0.38		0.16	0.30		0.19	0.19	0.19	0.13	0.13	0.13
Clearance Time (s)	4.0	5.0		4.0	5.0		4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	2.0	3.0		2.0	3.0		2.0	2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	423	1878		560	1061		321	335	300	235	252	207
v/s Ratio Prot	c0.18	0.22		0.11	c0.21		c0.15	0.15		0.03	c0.10	
v/s Ratio Perm									0.06			0.04
v/c Ratio	0.74	0.59		0.70	0.71		0.79	0.79	0.29	0.26	0.74	0.30
Uniform Delay, d1	46.0	32.5		51.5	40.5		50.1	50.0	45.0	50.6	54.2	50.9
Progression Factor	1.09	1.22		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	5.9	1.3		3.1	4.1		11.9	10.8	0.2	0.2	9.3	0.3
Delay (s)	55.8	41.1		54.6	44.6		62.0	60.8	45.2	50.8	63.5	51.2
Level of Service	E	D		D	D		E	E	D	D	E	D
Approach Delay (s)		44.3			48.0			53.8			56.4	
Approach LOS		D			D			D			E	

Intersection Summary			
HCM 2000 Control Delay	49.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	78.4%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	326	2	48	2	0	5	54	565	0	2	389	261
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5	4.5		4.5		4.0	5.0		4.0	5.0	
Lane Util. Factor		1.00	1.00		1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00	0.99		0.98		1.00	1.00		1.00	0.99	
Flpb, ped/bikes		1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Frt		1.00	0.85		0.90		1.00	1.00		1.00	0.94	
Flt Protected		0.95	1.00		0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1792	1560		1654		1770	3505		1805	3272	
Flt Permitted		0.95	1.00		0.99		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1792	1560		1654		1770	3505		1805	3272	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	354	2	52	2	0	5	59	614	0	2	423	284
RTOR Reduction (vph)	0	0	37	0	7	0	0	0	0	0	77	0
Lane Group Flow (vph)	0	356	15	0	0	0	59	614	0	2	630	0
Confl. Peds. (#/hr)			3			1			6			11
Heavy Vehicles (%)	1%	0%	2%	0%	0%	0%	2%	3%	0%	0%	3%	1%
Turn Type	Split	NA	Perm	Split	NA		Prot	NA		Prot	NA	
Protected Phases	3	3		4	4		1	6		5	2	
Permitted Phases			3									
Actuated Green, G (s)		19.6	19.6		0.7		5.8	29.3		0.7	24.2	
Effective Green, g (s)		19.6	19.6		0.7		5.8	29.3		0.7	24.2	
Actuated g/C Ratio		0.29	0.29		0.01		0.08	0.43		0.01	0.35	
Clearance Time (s)		4.5	4.5		4.5		4.0	5.0		4.0	5.0	
Vehicle Extension (s)		2.0	2.0		2.0		2.0	3.0		2.0	3.0	
Lane Grp Cap (vph)		514	447		16		150	1503		18	1159	
v/s Ratio Prot		c0.20			c0.00		c0.03	0.18		0.00	c0.19	
v/s Ratio Perm			0.01									
v/c Ratio		0.69	0.03		0.00		0.39	0.41		0.11	0.54	
Uniform Delay, d1		21.7	17.5		33.5		29.6	13.5		33.5	17.6	
Progression Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		3.3	0.0		0.0		0.6	0.2		1.0	0.5	
Delay (s)		24.9	17.5		33.5		30.2	13.7		34.5	18.2	
Level of Service		C	B		C		C	B		C	B	
Approach Delay (s)		24.0			33.5			15.1			18.2	
Approach LOS		C			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	18.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	68.3	Sum of lost time (s)	18.0
Intersection Capacity Utilization	60.7%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	86	80	63	533	404	35
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	97	90	71	599	454	39
Pedestrians	11			2	3	
Lane Width (ft)	12.0			12.0	12.0	
Walking Speed (ft/s)	4.0			4.0	4.0	
Percent Blockage	1			0	0	
Right turn flare (veh)						
Median type				TWLTL	TWLTL	
Median storage veh)				2	2	
Upstream signal (ft)					814	
pX, platoon unblocked	0.83	0.83	0.83			
vC, conflicting volume	909	467	504			
vC1, stage 1 conf vol	465					
vC2, stage 2 conf vol	444					
vCu, unblocked vol	788	255	300			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3	2.2			
p0 queue free %	80	85	93			
cM capacity (veh/h)	475	616	1046			

Direction, Lane #	EB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	187	71	299	299	454	39
Volume Left	97	71	0	0	0	0
Volume Right	90	0	0	0	0	39
cSH	534	1046	1700	1700	1700	1700
Volume to Capacity	0.35	0.07	0.18	0.18	0.27	0.02
Queue Length 95th (ft)	39	5	0	0	0	0
Control Delay (s)	15.3	8.7	0.0	0.0	0.0	0.0
Lane LOS	C	A				
Approach Delay (s)	15.3	0.9			0.0	
Approach LOS	C					

Intersection Summary			
Average Delay	2.6		
Intersection Capacity Utilization	44.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	1	15	14	84	151	3
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	1	17	16	94	170	3
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	110				82	63
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	110				82	63
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				82	100
cM capacity (veh/h)	1493				924	1007

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	18	110	173
Volume Left	1	0	170
Volume Right	0	94	3
cSH	1493	1700	926
Volume to Capacity	0.00	0.06	0.19
Queue Length 95th (ft)	0	0	17
Control Delay (s)	0.5	0.0	9.8
Lane LOS	A		A
Approach Delay (s)	0.5	0.0	9.8
Approach LOS			A

Intersection Summary			
Average Delay	5.6		
Intersection Capacity Utilization	21.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	56	747	388	552	592	57	291	78	259	40	56	16
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.0	5.0	4.0	5.0		4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95		0.95	0.95	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	0.99		1.00	1.00	0.97	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	0.97	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1805	3539	1599	3467	3477		1715	1747	1572	1805	1900	1587
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	0.97	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1805	3539	1599	3467	3477		1715	1747	1572	1805	1900	1587
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	61	812	422	600	643	62	316	85	282	43	61	17
RTOR Reduction (vph)	0	0	190	0	4	0	0	0	235	0	0	16
Lane Group Flow (vph)	61	812	232	600	701	0	199	202	47	43	61	1
Confl. Peds. (#/hr)						17			12			5
Confl. Bikes (#/hr)						1						
Heavy Vehicles (%)	0%	2%	1%	1%	2%	0%	0%	1%	0%	0%	0%	0%
Turn Type	Prot	NA	Perm	Prot	NA		Split	NA	Perm	Split	NA	Perm
Protected Phases	1	6		5	2		4	4		3	3	
Permitted Phases			6						4			3
Actuated Green, G (s)	7.4	42.9	42.9	23.9	59.4		18.2	18.2	18.2	7.0	7.0	7.0
Effective Green, g (s)	7.4	42.9	42.9	23.9	59.4		18.2	18.2	18.2	7.0	7.0	7.0
Actuated g/C Ratio	0.07	0.39	0.39	0.22	0.54		0.17	0.17	0.17	0.06	0.06	0.06
Clearance Time (s)	4.0	5.0	5.0	4.0	5.0		4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	2.0	3.0	3.0	2.0	3.0		2.0	2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	121	1380	623	753	1877		283	289	260	114	120	100
v/s Ratio Prot	0.03	c0.23		c0.17	0.20		c0.12	0.12		0.02	c0.03	
v/s Ratio Perm			0.15						0.03			0.00
v/c Ratio	0.50	0.59	0.37	0.80	0.37		0.70	0.70	0.18	0.38	0.51	0.01
Uniform Delay, d1	49.5	26.6	23.9	40.8	14.6		43.3	43.3	39.5	49.4	49.8	48.3
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.2	1.8	1.7	5.5	0.6		6.3	5.9	0.1	0.8	1.2	0.0
Delay (s)	50.7	28.4	25.7	46.2	15.1		49.7	49.2	39.6	50.2	51.1	48.3
Level of Service	D	C	C	D	B		D	D	D	D	D	D
Approach Delay (s)		28.6			29.4			45.4			50.4	
Approach LOS		C			C			D			D	

Intersection Summary			
HCM 2000 Control Delay	33.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	66.3%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	145	1044	213	182	1059	144	287	297	197	217	259	132
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.0	5.0	4.0	5.0		4.0	5.0		4.0	5.0	5.0
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91		0.97	0.95		0.97	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.95	1.00	1.00		1.00	0.99		1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.98		1.00	0.94		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3467	5085	1541	3502	4977		3467	3319		3467	3574	1520
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3467	5085	1541	3502	4977		3467	3319		3467	3574	1520
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	153	1099	224	192	1115	152	302	313	207	228	273	139
RTOR Reduction (vph)	0	0	111	0	10	0	0	108	0	0	0	120
Lane Group Flow (vph)	153	1099	113	192	1257	0	302	412	0	228	273	19
Confl. Peds. (#/hr)			28			5			16			18
Confl. Bikes (#/hr)			1			1						
Heavy Vehicles (%)	1%	2%	0%	0%	2%	3%	1%	1%	1%	1%	1%	3%
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA		Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2									4
Actuated Green, G (s)	12.8	63.3	63.3	11.2	61.7		15.1	19.9		12.6	17.4	17.4
Effective Green, g (s)	12.8	63.3	63.3	11.2	61.7		15.1	19.9		12.6	17.4	17.4
Actuated g/C Ratio	0.10	0.51	0.51	0.09	0.49		0.12	0.16		0.10	0.14	0.14
Clearance Time (s)	4.0	5.0	5.0	4.0	5.0		4.0	5.0		4.0	5.0	5.0
Vehicle Extension (s)	2.0	3.0	3.0	2.0	3.0		2.0	2.0		2.0	2.0	2.0
Lane Grp Cap (vph)	355	2575	780	313	2456		418	528		349	497	211
v/s Ratio Prot	0.04	c0.22		c0.05	c0.25		c0.09	c0.12		0.07	0.08	
v/s Ratio Perm			0.07									0.01
v/c Ratio	0.43	0.43	0.15	0.61	0.51		0.72	0.78		0.65	0.55	0.09
Uniform Delay, d1	52.7	19.4	16.4	54.8	21.4		52.9	50.5		54.1	50.1	46.9
Progression Factor	1.00	1.00	1.00	1.44	0.66		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.3	0.5	0.4	1.5	0.5		5.2	6.8		3.3	0.7	0.1
Delay (s)	53.0	19.9	16.8	80.2	14.7		58.1	57.3		57.4	50.8	47.0
Level of Service	D	B	B	F	B		E	E		E	D	D
Approach Delay (s)		22.9			23.3			57.6			52.3	
Approach LOS		C			C			E			D	

Intersection Summary			
HCM 2000 Control Delay	33.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	125.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	72.4%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	1019	435	0	1353	0	253
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	1096	468	0	1455	0	272
Pedestrians				1	11	
Lane Width (ft)				12.0	12.0	
Walking Speed (ft/s)				4.0	4.0	
Percent Blockage				0	1	
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)				624		
pX, platoon unblocked					0.86	
vC, conflicting volume			1574		1826	611
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1574		1395	611
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	38
cM capacity (veh/h)			420		115	437

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1
Volume Total	438	438	687	485	485	485	272
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	468	0	0	0	272
cSH	1700	1700	1700	1700	1700	1700	437
Volume to Capacity	0.26	0.26	0.40	0.29	0.29	0.29	0.62
Queue Length 95th (ft)	0	0	0	0	0	0	103
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	25.9
Lane LOS							D
Approach Delay (s)	0.0			0.0			25.9
Approach LOS							D

Intersection Summary			
Average Delay	2.1		
Intersection Capacity Utilization	52.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	306	792	174	352	699	50	474	149	329	46	174	180
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.0		4.0	5.0		4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	1.00	0.91		0.97	0.95		0.95	0.95	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	0.98	1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.97		1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	0.97	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	4977		3433	3527		1698	1741	1572	1687	1863	1519
Flt Permitted	0.95	1.00		0.95	1.00		0.95	0.97	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	4977		3433	3527		1698	1741	1572	1687	1863	1519
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	322	834	183	371	736	53	499	157	346	48	183	189
RTOR Reduction (vph)	0	24	0	0	4	0	0	0	270	0	0	136
Lane Group Flow (vph)	322	993	0	371	785	0	324	332	76	48	183	53
Confl. Peds. (#/hr)						6			2			15
Confl. Bikes (#/hr)			1						2			
Heavy Vehicles (%)	2%	1%	2%	2%	1%	2%	1%	1%	1%	7%	2%	3%
Turn Type	Prot	NA		Prot	NA		Split	NA	Perm	Split	NA	Perm
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases									3			4
Actuated Green, G (s)	31.4	42.8		20.1	31.5		27.3	27.3	27.3	16.8	16.8	16.8
Effective Green, g (s)	31.4	42.8		20.1	31.5		27.3	27.3	27.3	16.8	16.8	16.8
Actuated g/C Ratio	0.25	0.34		0.16	0.25		0.22	0.22	0.22	0.13	0.13	0.13
Clearance Time (s)	4.0	5.0		4.0	5.0		4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	2.0	3.0		2.0	3.0		2.0	2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	444	1704		552	888		370	380	343	226	250	204
v/s Ratio Prot	c0.18	0.20		0.11	c0.22		c0.19	0.19		0.03	c0.10	
v/s Ratio Perm									0.05			0.03
v/c Ratio	0.73	0.58		0.67	0.88		0.88	0.87	0.22	0.21	0.73	0.26
Uniform Delay, d1	42.9	33.8		49.3	45.0		47.2	47.2	40.1	48.2	51.9	48.5
Progression Factor	0.88	0.82		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	4.7	1.4		2.5	12.5		19.5	18.8	0.1	0.2	9.1	0.2
Delay (s)	42.3	29.0		51.9	57.5		66.7	66.0	40.2	48.4	61.1	48.8
Level of Service	D	C		D	E		E	E	D	D	E	D
Approach Delay (s)		32.2			55.7			57.3			54.1	
Approach LOS		C			E			E			D	

Intersection Summary			
HCM 2000 Control Delay	47.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	125.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	85.4%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	435	1	59	2	1	6	68	511	2	16	355	329
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5	4.5		4.5		4.0	5.0		4.0	5.0	
Lane Util. Factor		1.00	1.00		1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00	0.98		1.00		1.00	1.00		1.00	0.98	
Flpb, ped/bikes		1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Frt		1.00	0.85		0.91		1.00	1.00		1.00	0.93	
Flt Protected		0.95	1.00		0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1792	1582		1710		1805	3537		1703	3216	
Flt Permitted		0.95	1.00		0.99		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1792	1582		1710		1805	3537		1703	3216	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	463	1	63	2	1	6	72	544	2	17	378	350
RTOR Reduction (vph)	0	0	42	0	6	0	0	0	0	0	126	0
Lane Group Flow (vph)	0	464	21	0	3	0	72	546	0	17	602	0
Confl. Peds. (#/hr)			8						3			6
Confl. Bikes (#/hr)									1			2
Heavy Vehicles (%)	1%	0%	0%	0%	0%	0%	0%	2%	0%	6%	4%	1%
Turn Type	Split	NA	Perm	Split	NA		Prot	NA		Prot	NA	
Protected Phases	3	3		4	4		1	6		5	2	
Permitted Phases			3									
Actuated Green, G (s)		25.5	25.5		0.7		6.3	29.0		1.8	24.5	
Effective Green, g (s)		25.5	25.5		0.7		6.3	29.0		1.8	24.5	
Actuated g/C Ratio		0.34	0.34		0.01		0.08	0.39		0.02	0.33	
Clearance Time (s)		4.5	4.5		4.5		4.0	5.0		4.0	5.0	
Vehicle Extension (s)		2.0	2.0		2.0		2.0	3.0		2.0	3.0	
Lane Grp Cap (vph)		609	537		15		151	1367		40	1050	
v/s Ratio Prot		c0.26			c0.00		c0.04	0.15		0.01	c0.19	
v/s Ratio Perm			0.01									
v/c Ratio		0.76	0.04		0.20		0.48	0.40		0.42	0.57	
Uniform Delay, d1		22.0	16.6		36.9		32.8	16.7		36.1	20.9	
Progression Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		5.1	0.0		2.4		0.9	0.2		2.6	0.8	
Delay (s)		27.1	16.6		39.3		33.6	16.9		38.7	21.7	
Level of Service		C	B		D		C	B		D	C	
Approach Delay (s)		25.8			39.3			18.8			22.1	
Approach LOS		C			D			B			C	

Intersection Summary			
HCM 2000 Control Delay	22.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	67.8%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	152	92	76	429	346	70
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	162	98	81	456	368	74
Pedestrians	2			1		
Lane Width (ft)	12.0			12.0		
Walking Speed (ft/s)	4.0			4.0		
Percent Blockage	0			0		
Right turn flare (veh)						
Median type				TWLTL	TWLTL	
Median storage veh)				2	2	
Upstream signal (ft)					814	
pX, platoon unblocked	0.87	0.87	0.87			
vC, conflicting volume	760	371	445			
vC1, stage 1 conf vol	370					
vC2, stage 2 conf vol	390					
vCu, unblocked vol	647	198	283			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3	2.2			
p0 queue free %	70	86	93			
cM capacity (veh/h)	531	706	1118			

Direction, Lane #	EB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	260	81	228	228	368	74
Volume Left	162	81	0	0	0	0
Volume Right	98	0	0	0	0	74
cSH	586	1118	1700	1700	1700	1700
Volume to Capacity	0.44	0.07	0.13	0.13	0.22	0.04
Queue Length 95th (ft)	57	6	0	0	0	0
Control Delay (s)	15.9	8.5	0.0	0.0	0.0	0.0
Lane LOS	C	A				
Approach Delay (s)	15.9	1.3			0.0	
Approach LOS	C					

Intersection Summary			
Average Delay	3.9		
Intersection Capacity Utilization	46.5%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	0	2	2	144	242	2
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84
Hourly flow rate (vph)	0	2	2	171	288	2
Pedestrians			2			
Lane Width (ft)			12.0			
Walking Speed (ft/s)			4.0			
Percent Blockage			0			
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	174				92	88
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	174				92	88
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				68	100
cM capacity (veh/h)	1415				911	976

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	2	174	290
Volume Left	0	0	288
Volume Right	0	171	2
cSH	1415	1700	911
Volume to Capacity	0.00	0.10	0.32
Queue Length 95th (ft)	0	0	34
Control Delay (s)	0.0	0.0	10.8
Lane LOS			B
Approach Delay (s)	0.0	0.0	10.8
Approach LOS			B

Intersection Summary			
Average Delay	6.7		
Intersection Capacity Utilization	29.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	51	710	310	353	536	37	351	34	397	38	39	31
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.0	5.0	4.0	5.0		4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95		0.95	0.95	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00		1.00	1.00	0.97	1.00	1.00	0.95
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	0.96	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1805	3574	1594	3467	3526		1698	1719	1555	1719	1900	1531
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	0.96	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1805	3574	1594	3467	3526		1698	1719	1555	1719	1900	1531
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	53	740	323	368	558	39	366	35	414	40	41	32
RTOR Reduction (vph)	0	0	141	0	3	0	0	0	343	0	0	30
Lane Group Flow (vph)	53	740	182	368	594	0	201	200	71	40	41	2
Confl. Peds. (#/hr)			1			16			12			37
Confl. Bikes (#/hr)						2			1			
Heavy Vehicles (%)	0%	1%	0%	1%	1%	0%	1%	0%	1%	5%	0%	0%
Turn Type	Prot	NA	Perm	Prot	NA		Split	NA	Perm	Split	NA	Perm
Protected Phases	1	6		5	2		4	4		3	3	
Permitted Phases			6						4			3
Actuated Green, G (s)	7.2	51.0	51.0	15.9	59.7		18.9	18.9	18.9	6.2	6.2	6.2
Effective Green, g (s)	7.2	51.0	51.0	15.9	59.7		18.9	18.9	18.9	6.2	6.2	6.2
Actuated g/C Ratio	0.07	0.46	0.46	0.14	0.54		0.17	0.17	0.17	0.06	0.06	0.06
Clearance Time (s)	4.0	5.0	5.0	4.0	5.0		4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	2.0	3.0	3.0	2.0	3.0		2.0	2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	118	1657	739	501	1913		291	295	267	96	107	86
v/s Ratio Prot	0.03	c0.21		c0.11	0.17		c0.12	0.12		c0.02	0.02	
v/s Ratio Perm			0.11						0.05			0.00
v/c Ratio	0.45	0.45	0.25	0.73	0.31		0.69	0.68	0.27	0.42	0.38	0.02
Uniform Delay, d1	49.5	20.0	17.9	45.0	13.8		42.8	42.7	39.5	50.2	50.1	49.0
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.0	0.9	0.8	4.8	0.4		5.6	4.8	0.2	1.1	0.8	0.0
Delay (s)	50.5	20.8	18.7	49.8	14.3		48.4	47.5	39.7	51.2	50.9	49.1
Level of Service	D	C	B	D	B		D	D	D	D	D	D
Approach Delay (s)		21.6			27.8			43.8			50.5	
Approach LOS		C			C			D			D	

Intersection Summary			
HCM 2000 Control Delay	30.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	79.1%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Appendix D Cumulative Conditions Traffic Operation Worksheets

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	164	1154	244	276	1012	169	308	414	266	212	438	148
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.0	5.0	4.0	5.0		4.0	5.0		4.0	5.0	5.0
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91		0.97	0.95		0.97	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.95	1.00	1.00		1.00	0.99		1.00	1.00	0.95
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.98		1.00	0.94		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3502	5036	1491	3502	4955		3433	3305		3433	3574	1513
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3502	5036	1491	3502	4955		3433	3305		3433	3574	1513
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	164	1154	244	276	1012	169	308	414	266	212	438	148
RTOR Reduction (vph)	0	0	136	0	15	0	0	89	0	0	0	121
Lane Group Flow (vph)	164	1154	108	276	1166	0	308	591	0	212	438	27
Confl. Peds. (#/hr)			30			15			19			38
Heavy Vehicles (%)	0%	3%	3%	0%	2%	2%	2%	1%	2%	2%	1%	1%
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA		Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2									4
Actuated Green, G (s)	17.1	57.4	57.4	14.6	54.9		15.9	27.6		12.4	24.1	24.1
Effective Green, g (s)	17.1	57.4	57.4	14.6	54.9		15.9	27.6		12.4	24.1	24.1
Actuated g/C Ratio	0.13	0.44	0.44	0.11	0.42		0.12	0.21		0.10	0.19	0.19
Clearance Time (s)	4.0	5.0	5.0	4.0	5.0		4.0	5.0		4.0	5.0	5.0
Vehicle Extension (s)	2.0	3.0	3.0	2.0	3.0		2.0	2.0		2.0	2.0	2.0
Lane Grp Cap (vph)	460	2223	658	393	2092		419	701		327	662	280
v/s Ratio Prot	0.05	c0.23		c0.08	c0.24		c0.09	c0.18		0.06	0.12	
v/s Ratio Perm			0.07									0.02
v/c Ratio	0.36	0.52	0.16	0.70	0.56		0.74	0.84		0.65	0.66	0.10
Uniform Delay, d1	51.4	26.3	21.9	55.6	28.4		55.0	49.1		56.7	49.2	43.9
Progression Factor	1.00	1.00	1.00	0.67	0.85		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.2	0.9	0.5	2.1	0.5		5.7	8.7		3.3	1.9	0.1
Delay (s)	51.6	27.2	22.4	39.4	24.5		60.7	57.9		60.0	51.1	44.0
Level of Service	D	C	C	D	C		E	E		E	D	D
Approach Delay (s)		29.0			27.3			58.7			52.1	
Approach LOS		C			C			E			D	

Intersection Summary			
HCM 2000 Control Delay	38.4	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	81.9%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	1445	351	0	1447	0	212
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	1445	351	0	1447	0	212
Pedestrians					23	
Lane Width (ft)					12.0	
Walking Speed (ft/s)					4.0	
Percent Blockage					2	
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)				624		
pX, platoon unblocked					0.82	
vC, conflicting volume			1819		2126	680
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1819		1611	680
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	46
cM capacity (veh/h)			335		78	390

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1
Volume Total	578	578	640	482	482	482	212
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	351	0	0	0	212
cSH	1700	1700	1700	1700	1700	1700	390
Volume to Capacity	0.34	0.34	0.38	0.28	0.28	0.28	0.54
Queue Length 95th (ft)	0	0	0	0	0	0	78
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	24.6
Lane LOS							C
Approach Delay (s)	0.0			0.0			24.6
Approach LOS							C

Intersection Summary			
Average Delay	1.5		
Intersection Capacity Utilization	56.0%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	366	1140	151	452	829	53	399	194	526	69	215	218
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.0		4.0	5.0		4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	1.00	0.91		0.97	0.95		0.95	0.95	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	0.98	1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.98		1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	0.98	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1787	5005		3467	3539		1681	1750	1569	1770	1900	1556
Flt Permitted	0.95	1.00		0.95	1.00		0.95	0.98	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1787	5005		3467	3539		1681	1750	1569	1770	1900	1556
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	366	1140	151	452	829	53	399	194	526	69	215	218
RTOR Reduction (vph)	0	11	0	0	4	0	0	0	418	0	0	125
Lane Group Flow (vph)	366	1280	0	452	878	0	291	302	108	69	215	93
Confl. Peds. (#/hr)			16			1			5			10
Confl. Bikes (#/hr)												1
Heavy Vehicles (%)	1%	1%	4%	1%	1%	0%	2%	1%	1%	2%	0%	1%
Turn Type	Prot	NA		Prot	NA		Split	NA	Perm	Split	NA	Perm
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases									3			4
Actuated Green, G (s)	35.6	44.9		21.0	30.3		26.7	26.7	26.7	19.4	19.4	19.4
Effective Green, g (s)	35.6	44.9		21.0	30.3		26.7	26.7	26.7	19.4	19.4	19.4
Actuated g/C Ratio	0.27	0.35		0.16	0.23		0.21	0.21	0.21	0.15	0.15	0.15
Clearance Time (s)	4.0	5.0		4.0	5.0		4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	2.0	3.0		2.0	3.0		2.0	2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	489	1728		560	824		345	359	322	264	283	232
v/s Ratio Prot	0.20	c0.26		0.13	c0.25		c0.17	0.17		0.04	c0.11	
v/s Ratio Perm									0.07			0.06
v/c Ratio	0.75	0.74		0.81	1.07		0.84	0.84	0.34	0.26	0.76	0.40
Uniform Delay, d1	43.1	37.4		52.5	49.9		49.6	49.6	44.1	49.0	53.1	50.0
Progression Factor	1.09	1.19		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	5.0	2.7		7.9	50.4		16.3	15.5	0.2	0.2	9.9	0.4
Delay (s)	52.1	47.3		60.4	100.2		65.9	65.1	44.3	49.1	63.0	50.5
Level of Service	D	D		E	F		E	E	D	D	E	D
Approach Delay (s)		48.4			86.7			55.5			55.7	
Approach LOS		D			F			E			E	

Intersection Summary			
HCM 2000 Control Delay	62.0	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	92.1%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	400	3	59	3	0	6	67	713	0	3	491	324
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5	4.5		4.5		4.0	5.0		4.0	5.0	
Lane Util. Factor		1.00	1.00		1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00	0.98		0.98		1.00	1.00		1.00	0.98	
Flpb, ped/bikes		1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Frt		1.00	0.85		0.91		1.00	1.00		1.00	0.94	
Flt Protected		0.95	1.00		0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1792	1559		1661		1770	3505		1805	3271	
Flt Permitted		0.95	1.00		0.98		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1792	1559		1661		1770	3505		1805	3271	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	400	3	59	3	0	6	67	713	0	3	491	324
RTOR Reduction (vph)	0	0	41	0	9	0	0	0	0	0	71	0
Lane Group Flow (vph)	0	403	18	0	0	0	67	713	0	3	744	0
Confl. Peds. (#/hr)			3			1			6			11
Heavy Vehicles (%)	1%	0%	2%	0%	0%	0%	2%	3%	0%	0%	3%	1%
Turn Type	Split	NA	Perm	Split	NA		Prot	NA		Prot	NA	
Protected Phases	3	3		4	4		1	6		5	2	
Permitted Phases			3									
Actuated Green, G (s)		23.8	23.8		0.8		6.2	34.3		0.8	28.9	
Effective Green, g (s)		23.8	23.8		0.8		6.2	34.3		0.8	28.9	
Actuated g/C Ratio		0.31	0.31		0.01		0.08	0.44		0.01	0.37	
Clearance Time (s)		4.5	4.5		4.5		4.0	5.0		4.0	5.0	
Vehicle Extension (s)		2.0	2.0		2.0		2.0	3.0		2.0	3.0	
Lane Grp Cap (vph)		548	477		17		141	1547		18	1216	
v/s Ratio Prot		c0.22			c0.00		c0.04	0.20		0.00	c0.23	
v/s Ratio Perm			0.01									
v/c Ratio		0.74	0.04		0.01		0.48	0.46		0.17	0.61	
Uniform Delay, d1		24.1	18.9		38.1		34.2	15.2		38.1	19.8	
Progression Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		4.4	0.0		0.0		0.9	0.2		1.6	0.9	
Delay (s)		28.5	18.9		38.1		35.1	15.4		39.7	20.8	
Level of Service		C	B		D		D	B		D	C	
Approach Delay (s)		27.3			38.1			17.1			20.8	
Approach LOS		C			D			B			C	

Intersection Summary			
HCM 2000 Control Delay	21.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	77.7	Sum of lost time (s)	18.0
Intersection Capacity Utilization	69.6%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	109	101	80	672	509	44
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	109	101	80	672	509	44
Pedestrians	11			2	3	
Lane Width (ft)	12.0			12.0	12.0	
Walking Speed (ft/s)	4.0			4.0	4.0	
Percent Blockage	1			0	0	
Right turn flare (veh)						
Median type				TWLTL	TWLTL	
Median storage veh)				2	2	
Upstream signal (ft)					814	
pX, platoon unblocked	0.79	0.79	0.79			
vC, conflicting volume	1019	522	564			
vC1, stage 1 conf vol	520					
vC2, stage 2 conf vol	499					
vCu, unblocked vol	889	259	312			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3	2.2			
p0 queue free %	75	83	92			
cM capacity (veh/h)	433	582	983			

Direction, Lane #	EB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	210	80	336	336	509	44
Volume Left	109	80	0	0	0	0
Volume Right	101	0	0	0	0	44
cSH	493	983	1700	1700	1700	1700
Volume to Capacity	0.43	0.08	0.20	0.20	0.30	0.03
Queue Length 95th (ft)	52	7	0	0	0	0
Control Delay (s)	17.6	9.0	0.0	0.0	0.0	0.0
Lane LOS	C	A				
Approach Delay (s)	17.6	1.0			0.0	
Approach LOS	C					

Intersection Summary			
Average Delay	2.9		
Intersection Capacity Utilization	53.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	1	19	18	106	191	4
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	1	19	18	106	191	4
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	124				92	71
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	124				92	71
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				79	100
cM capacity (veh/h)	1475				912	997

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	20	124	195
Volume Left	1	0	191
Volume Right	0	106	4
cSH	1475	1700	914
Volume to Capacity	0.00	0.07	0.21
Queue Length 95th (ft)	0	0	20
Control Delay (s)	0.4	0.0	10.0
Lane LOS	A		B
Approach Delay (s)	0.4	0.0	10.0
Approach LOS			B

Intersection Summary			
Average Delay	5.8		
Intersection Capacity Utilization	25.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	71	940	489	697	745	72	366	98	327	50	71	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.0	5.0	4.0	5.0		4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95		0.95	0.95	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	0.99		1.00	1.00	0.97	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	0.97	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1805	3539	1599	3467	3477		1715	1747	1572	1805	1900	1587
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	0.97	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1805	3539	1599	3467	3477		1715	1747	1572	1805	1900	1587
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	71	940	489	697	745	72	366	98	327	50	71	20
RTOR Reduction (vph)	0	0	212	0	4	0	0	0	266	0	0	19
Lane Group Flow (vph)	71	940	277	697	813	0	231	233	61	50	71	1
Confl. Peds. (#/hr)						17			12			5
Confl. Bikes (#/hr)						1						
Heavy Vehicles (%)	0%	2%	1%	1%	2%	0%	0%	1%	0%	0%	0%	0%
Turn Type	Prot	NA	Perm	Prot	NA		Split	NA	Perm	Split	NA	Perm
Protected Phases	1	6		5	2		4	4		3	3	
Permitted Phases			6						4			3
Actuated Green, G (s)	7.9	35.1	35.1	28.8	56.0		20.6	20.6	20.6	7.5	7.5	7.5
Effective Green, g (s)	7.9	35.1	35.1	28.8	56.0		20.6	20.6	20.6	7.5	7.5	7.5
Actuated g/C Ratio	0.07	0.32	0.32	0.26	0.51		0.19	0.19	0.19	0.07	0.07	0.07
Clearance Time (s)	4.0	5.0	5.0	4.0	5.0		4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	2.0	3.0	3.0	2.0	3.0		2.0	2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	129	1129	510	907	1770		321	327	294	123	129	108
v/s Ratio Prot	0.04	c0.27		c0.20	0.23		c0.13	0.13		0.03	c0.04	
v/s Ratio Perm			0.17						0.04			0.00
v/c Ratio	0.55	0.83	0.54	0.77	0.46		0.72	0.71	0.21	0.41	0.55	0.01
Uniform Delay, d1	49.3	34.7	30.9	37.5	17.3		42.0	41.9	37.8	49.1	49.6	47.8
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.9	7.2	4.1	3.6	0.9		6.3	6.0	0.1	0.8	2.9	0.0
Delay (s)	52.2	42.0	35.0	41.1	18.2		48.3	47.9	37.9	49.9	52.5	47.8
Level of Service	D	D	C	D	B		D	D	D	D	D	D
Approach Delay (s)		40.2			28.7			43.9			50.9	
Approach LOS		D			C			D			D	

Intersection Summary			
HCM 2000 Control Delay	36.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	77.5%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	183	1312	269	228	1333	181	362	375	247	273	327	167
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.0	5.0	4.0	5.0		4.0	5.0		4.0	5.0	5.0
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91		0.97	0.95		0.97	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.95	1.00	1.00		1.00	0.99		1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.98		1.00	0.94		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3467	5085	1541	3502	4977		3467	3320		3467	3574	1520
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3467	5085	1541	3502	4977		3467	3320		3467	3574	1520
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	183	1312	269	228	1333	181	362	375	247	273	327	167
RTOR Reduction (vph)	0	0	145	0	11	0	0	104	0	0	0	138
Lane Group Flow (vph)	183	1312	124	228	1503	0	362	518	0	273	327	29
Confl. Peds. (#/hr)			28			5			16			18
Confl. Bikes (#/hr)			1			1						
Heavy Vehicles (%)	1%	2%	0%	0%	2%	3%	1%	1%	1%	1%	1%	3%
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA		Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2									4
Actuated Green, G (s)	12.7	56.4	56.4	12.5	56.2		16.7	23.9		14.2	21.4	21.4
Effective Green, g (s)	12.7	56.4	56.4	12.5	56.2		16.7	23.9		14.2	21.4	21.4
Actuated g/C Ratio	0.10	0.45	0.45	0.10	0.45		0.13	0.19		0.11	0.17	0.17
Clearance Time (s)	4.0	5.0	5.0	4.0	5.0		4.0	5.0		4.0	5.0	5.0
Vehicle Extension (s)	2.0	3.0	3.0	2.0	3.0		2.0	2.0		2.0	2.0	2.0
Lane Grp Cap (vph)	352	2294	695	350	2237		463	634		393	611	260
v/s Ratio Prot	0.05	c0.26		0.07	c0.30		c0.10	c0.16		0.08	0.09	
v/s Ratio Perm			0.08									0.02
v/c Ratio	0.52	0.57	0.18	0.65	0.67		0.78	0.82		0.69	0.54	0.11
Uniform Delay, d1	53.3	25.4	20.5	54.2	27.1		52.4	48.5		53.3	47.3	43.8
Progression Factor	1.00	1.00	1.00	1.35	0.60		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.5	1.0	0.6	0.3	0.1		7.7	7.7		4.3	0.5	0.1
Delay (s)	53.8	26.4	21.0	73.2	16.5		60.1	56.1		57.6	47.7	43.8
Level of Service	D	C	C	E	B		E	E		E	D	D
Approach Delay (s)		28.4			23.9			57.6			50.4	
Approach LOS		C			C			E			D	

Intersection Summary			
HCM 2000 Control Delay	35.6	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	125.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	79.6%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	1293	533	0	1702	0	313
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	1293	533	0	1702	0	313
Pedestrians				1	11	
Lane Width (ft)				12.0	12.0	
Walking Speed (ft/s)				4.0	4.0	
Percent Blockage				0	1	
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)				624		
pX, platoon unblocked					0.85	
vC, conflicting volume			1837		2138	710
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1837		1721	710
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	17
cM capacity (veh/h)			333		69	377

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1
Volume Total	517	517	792	567	567	567	313
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	533	0	0	0	313
cSH	1700	1700	1700	1700	1700	1700	377
Volume to Capacity	0.30	0.30	0.47	0.33	0.33	0.33	0.83
Queue Length 95th (ft)	0	0	0	0	0	0	189
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	47.2
Lane LOS							E
Approach Delay (s)	0.0			0.0			47.2
Approach LOS							E

Intersection Summary			
Average Delay	3.8		
Intersection Capacity Utilization	63.4%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	386	1000	220	439	882	63	592	187	412	58	218	227
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.0		4.0	5.0		4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	1.00	0.91		0.97	0.95		0.95	0.95	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	0.98	1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.97		1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	0.97	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	4976		3433	3527		1698	1741	1573	1687	1863	1519
Flt Permitted	0.95	1.00		0.95	1.00		0.95	0.97	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	4976		3433	3527		1698	1741	1573	1687	1863	1519
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	386	1000	220	439	882	63	592	187	412	58	218	227
RTOR Reduction (vph)	0	25	0	0	4	0	0	0	315	0	0	134
Lane Group Flow (vph)	386	1195	0	439	941	0	385	394	97	58	218	93
Confl. Peds. (#/hr)						6			2			15
Confl. Bikes (#/hr)			1						2			
Heavy Vehicles (%)	2%	1%	2%	2%	1%	2%	1%	1%	1%	7%	2%	3%
Turn Type	Prot	NA		Prot	NA		Split	NA	Perm	Split	NA	Perm
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases									3			4
Actuated Green, G (s)	32.2	39.2		19.0	26.0		29.4	29.4	29.4	19.4	19.4	19.4
Effective Green, g (s)	32.2	39.2		19.0	26.0		29.4	29.4	29.4	19.4	19.4	19.4
Actuated g/C Ratio	0.26	0.31		0.15	0.21		0.24	0.24	0.24	0.16	0.16	0.16
Clearance Time (s)	4.0	5.0		4.0	5.0		4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	2.0	3.0		2.0	3.0		2.0	2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	455	1560		521	733		399	409	369	261	289	235
v/s Ratio Prot	c0.22	0.24		0.13	c0.27		c0.23	0.23		0.03	c0.12	
v/s Ratio Perm									0.06			0.06
v/c Ratio	0.85	0.77		0.84	1.28		0.96	0.96	0.26	0.22	0.75	0.39
Uniform Delay, d1	44.1	38.8		51.5	49.5		47.3	47.3	39.0	46.2	50.5	47.5
Progression Factor	1.03	0.92		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	12.1	3.3		11.4	138.0		35.5	34.6	0.1	0.2	9.5	0.4
Delay (s)	57.5	39.0		62.9	187.5		82.8	81.9	39.1	46.4	60.0	47.9
Level of Service	E	D		E	F		F	F	D	D	E	D
Approach Delay (s)		43.5			148.0			67.4			53.0	
Approach LOS		D			F			E			D	

Intersection Summary			
HCM 2000 Control Delay	81.4	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	0.97		
Actuated Cycle Length (s)	125.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	100.7%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	538	1	73	3	1	8	83	645	3	20	448	409
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5	4.5		4.5		4.0	5.0		4.0	5.0	
Lane Util. Factor		1.00	1.00		1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00	0.98		1.00		1.00	1.00		1.00	0.98	
Flpb, ped/bikes		1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Frt		1.00	0.85		0.91		1.00	1.00		1.00	0.93	
Flt Protected		0.95	1.00		0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1792	1579		1708		1805	3537		1703	3214	
Flt Permitted		0.95	1.00		0.99		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1792	1579		1708		1805	3537		1703	3214	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	538	1	73	3	1	8	83	645	3	20	448	409
RTOR Reduction (vph)	0	0	46	0	8	0	0	0	0	0	121	0
Lane Group Flow (vph)	0	539	27	0	4	0	83	648	0	20	736	0
Confl. Peds. (#/hr)			8						3			6
Confl. Bikes (#/hr)									1			2
Heavy Vehicles (%)	1%	0%	0%	0%	0%	0%	0%	2%	0%	6%	4%	1%
Turn Type	Split	NA	Perm	Split	NA		Prot	NA		Prot	NA	
Protected Phases	3	3		4	4		1	6		5	2	
Permitted Phases			3									
Actuated Green, G (s)		34.6	34.6		1.8		7.1	37.7		1.7	32.3	
Effective Green, g (s)		34.6	34.6		1.8		7.1	37.7		1.7	32.3	
Actuated g/C Ratio		0.37	0.37		0.02		0.08	0.40		0.02	0.34	
Clearance Time (s)		4.5	4.5		4.5		4.0	5.0		4.0	5.0	
Vehicle Extension (s)		2.0	2.0		2.0		2.0	3.0		2.0	3.0	
Lane Grp Cap (vph)		661	582		32		136	1421		30	1106	
v/s Ratio Prot		c0.30			c0.00		c0.05	0.18		0.01	c0.23	
v/s Ratio Perm			0.02									
v/c Ratio		0.82	0.05		0.13		0.61	0.46		0.67	0.67	
Uniform Delay, d1		26.7	19.0		45.2		42.0	20.5		45.8	26.2	
Progression Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		7.3	0.0		0.7		5.6	0.2		35.7	1.5	
Delay (s)		34.0	19.0		45.9		47.6	20.8		81.4	27.7	
Level of Service		C	B		D		D	C		F	C	
Approach Delay (s)		32.2			45.9			23.8			28.9	
Approach LOS		C			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	28.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	93.8	Sum of lost time (s)	18.0
Intersection Capacity Utilization	78.6%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	192	116	96	539	436	88
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	192	116	96	539	436	88
Pedestrians	2			1		
Lane Width (ft)	12.0			12.0		
Walking Speed (ft/s)	4.0			4.0		
Percent Blockage	0			0		
Right turn flare (veh)						
Median type				TWLTL	TWLTL	
Median storage veh)				2	2	
Upstream signal (ft)					814	
pX, platoon unblocked	0.81	0.81	0.81			
vC, conflicting volume	900	439	526			
vC1, stage 1 conf vol	438					
vC2, stage 2 conf vol	462					
vCu, unblocked vol	754	183	291			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3	2.2			
p0 queue free %	59	83	91			
cM capacity (veh/h)	472	671	1031			

Direction, Lane #	EB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	308	96	270	270	436	88
Volume Left	192	96	0	0	0	0
Volume Right	116	0	0	0	0	88
cSH	531	1031	1700	1700	1700	1700
Volume to Capacity	0.58	0.09	0.16	0.16	0.26	0.05
Queue Length 95th (ft)	91	8	0	0	0	0
Control Delay (s)	20.7	8.8	0.0	0.0	0.0	0.0
Lane LOS	C	A				
Approach Delay (s)	20.7	1.3			0.0	
Approach LOS	C					

Intersection Summary			
Average Delay	4.9		
Intersection Capacity Utilization	56.0%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	0	3	3	182	305	3
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	3	3	182	305	3
Pedestrians			2			
Lane Width (ft)			12.0			
Walking Speed (ft/s)			4.0			
Percent Blockage			0			
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	185				99	94
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	185				99	94
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				66	100
cM capacity (veh/h)	1402				903	968

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	3	185	308
Volume Left	0	0	305
Volume Right	0	182	3
cSH	1402	1700	904
Volume to Capacity	0.00	0.11	0.34
Queue Length 95th (ft)	0	0	38
Control Delay (s)	0.0	0.0	11.0
Lane LOS			B
Approach Delay (s)	0.0	0.0	11.0
Approach LOS			B

Intersection Summary			
Average Delay	6.8		
Intersection Capacity Utilization	35.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	64	894	390	446	673	47	442	43	501	48	49	39
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.0	5.0	4.0	5.0		4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95		0.95	0.95	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00		1.00	1.00	0.97	1.00	1.00	0.95
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	0.96	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1805	3574	1594	3467	3526		1698	1720	1555	1719	1900	1531
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	0.96	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1805	3574	1594	3467	3526		1698	1720	1555	1719	1900	1531
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	64	894	390	446	673	47	442	43	501	48	49	39
RTOR Reduction (vph)	0	0	156	0	3	0	0	0	385	0	0	37
Lane Group Flow (vph)	64	894	234	446	717	0	243	242	116	48	49	2
Confl. Peds. (#/hr)			1			16			12			37
Confl. Bikes (#/hr)						2			1			
Heavy Vehicles (%)	0%	1%	0%	1%	1%	0%	1%	0%	1%	5%	0%	0%
Turn Type	Prot	NA	Perm	Prot	NA		Split	NA	Perm	Split	NA	Perm
Protected Phases	1	6		5	2		4	4		3	3	
Permitted Phases			6						4			3
Actuated Green, G (s)	7.6	44.4	44.4	18.4	55.2		22.6	22.6	22.6	6.6	6.6	6.6
Effective Green, g (s)	7.6	44.4	44.4	18.4	55.2		22.6	22.6	22.6	6.6	6.6	6.6
Actuated g/C Ratio	0.07	0.40	0.40	0.17	0.50		0.21	0.21	0.21	0.06	0.06	0.06
Clearance Time (s)	4.0	5.0	5.0	4.0	5.0		4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	2.0	3.0	3.0	2.0	3.0		2.0	2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	124	1442	643	579	1769		348	353	319	103	114	91
v/s Ratio Prot	0.04	c0.25		c0.13	0.20		c0.14	0.14		c0.03	0.03	
v/s Ratio Perm			0.15						0.07			0.00
v/c Ratio	0.52	0.62	0.36	0.77	0.41		0.70	0.69	0.36	0.47	0.43	0.03
Uniform Delay, d1	49.4	26.1	22.9	43.8	17.1		40.5	40.4	37.5	50.0	49.9	48.7
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.5	2.0	1.6	5.7	0.7		4.9	4.4	0.3	1.2	0.9	0.0
Delay (s)	50.9	28.1	24.5	49.5	17.8		45.4	44.8	37.8	51.2	50.8	48.7
Level of Service	D	C	C	D	B		D	D	D	D	D	D
Approach Delay (s)		28.2			29.9			41.4			50.4	
Approach LOS		C			C			D			D	

Intersection Summary			
HCM 2000 Control Delay	33.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	87.8%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Appendix E Cumulative Plus Project Conditions Traffic Operation Worksheets

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	164	1156	244	277	1015	170	308	414	267	213	438	148
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.0	5.0	4.0	5.0		4.0	5.0		4.0	5.0	5.0
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91		0.97	0.95		0.97	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.95	1.00	1.00		1.00	0.99		1.00	1.00	0.95
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.98		1.00	0.94		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3502	5036	1491	3502	4955		3433	3305		3433	3574	1513
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3502	5036	1491	3502	4955		3433	3305		3433	3574	1513
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	164	1156	244	277	1015	170	308	414	267	213	438	148
RTOR Reduction (vph)	0	0	136	0	15	0	0	91	0	0	0	121
Lane Group Flow (vph)	164	1156	108	277	1170	0	308	590	0	213	438	27
Confl. Peds. (#/hr)			30			15			19			38
Heavy Vehicles (%)	0%	3%	3%	0%	2%	2%	2%	1%	2%	2%	1%	1%
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA		Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2									4
Actuated Green, G (s)	16.6	57.4	57.4	14.6	55.4		15.9	27.6		12.4	24.1	24.1
Effective Green, g (s)	16.6	57.4	57.4	14.6	55.4		15.9	27.6		12.4	24.1	24.1
Actuated g/C Ratio	0.13	0.44	0.44	0.11	0.43		0.12	0.21		0.10	0.19	0.19
Clearance Time (s)	4.0	5.0	5.0	4.0	5.0		4.0	5.0		4.0	5.0	5.0
Vehicle Extension (s)	2.0	3.0	3.0	2.0	3.0		2.0	2.0		2.0	2.0	2.0
Lane Grp Cap (vph)	447	2223	658	393	2111		419	701		327	662	280
v/s Ratio Prot	0.05	c0.23		c0.08	c0.24		c0.09	c0.18		0.06	0.12	
v/s Ratio Perm			0.07									0.02
v/c Ratio	0.37	0.52	0.16	0.70	0.55		0.74	0.84		0.65	0.66	0.10
Uniform Delay, d1	51.9	26.3	21.9	55.6	28.0		55.0	49.1		56.7	49.2	43.9
Progression Factor	1.00	1.00	1.00	0.67	0.85		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.2	0.9	0.5	2.1	0.5		5.7	8.7		3.5	1.9	0.1
Delay (s)	52.1	27.2	22.4	39.6	24.2		60.7	57.8		60.2	51.1	44.0
Level of Service	D	C	C	D	C		E	E		E	D	D
Approach Delay (s)		29.0			27.1			58.7			52.2	
Approach LOS		C			C			E			D	

Intersection Summary			
HCM 2000 Control Delay	38.4	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	81.9%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	1440	361	0	1452	0	217
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	1440	361	0	1452	0	217
Pedestrians					23	
Lane Width (ft)					12.0	
Walking Speed (ft/s)					4.0	
Percent Blockage					2	
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)				624		
pX, platoon unblocked					0.82	
vC, conflicting volume			1824		2128	684
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1824		1619	684
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	44
cM capacity (veh/h)			333		78	389

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1
Volume Total	576	576	649	484	484	484	217
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	361	0	0	0	217
cSH	1700	1700	1700	1700	1700	1700	389
Volume to Capacity	0.34	0.34	0.38	0.28	0.28	0.28	0.56
Queue Length 95th (ft)	0	0	0	0	0	0	82
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	25.4
Lane LOS							D
Approach Delay (s)	0.0			0.0			25.4
Approach LOS							D

Intersection Summary			
Average Delay	1.6		
Intersection Capacity Utilization	56.4%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	366	1140	151	455	829	53	404	196	529	69	216	218
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.0		4.0	5.0		4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	1.00	0.91		0.97	0.95		0.95	0.95	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	0.98	1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.98		1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	0.98	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1787	5005		3467	3539		1681	1750	1569	1770	1900	1556
Flt Permitted	0.95	1.00		0.95	1.00		0.95	0.98	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1787	5005		3467	3539		1681	1750	1569	1770	1900	1556
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	366	1140	151	455	829	53	404	196	529	69	216	218
RTOR Reduction (vph)	0	11	0	0	4	0	0	0	419	0	0	124
Lane Group Flow (vph)	366	1280	0	455	878	0	295	305	110	69	216	94
Confl. Peds. (#/hr)			16			1			5			10
Confl. Bikes (#/hr)												1
Heavy Vehicles (%)	1%	1%	4%	1%	1%	0%	2%	1%	1%	2%	0%	1%
Turn Type	Prot	NA		Prot	NA		Split	NA	Perm	Split	NA	Perm
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases									3			4
Actuated Green, G (s)	35.4	44.4		21.1	30.1		27.0	27.0	27.0	19.5	19.5	19.5
Effective Green, g (s)	35.4	44.4		21.1	30.1		27.0	27.0	27.0	19.5	19.5	19.5
Actuated g/C Ratio	0.27	0.34		0.16	0.23		0.21	0.21	0.21	0.15	0.15	0.15
Clearance Time (s)	4.0	5.0		4.0	5.0		4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	2.0	3.0		2.0	3.0		2.0	2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	486	1709		562	819		349	363	325	265	285	233
v/s Ratio Prot	0.20	c0.26		0.13	c0.25		c0.18	0.17		0.04	c0.11	
v/s Ratio Perm									0.07			0.06
v/c Ratio	0.75	0.75		0.81	1.07		0.85	0.84	0.34	0.26	0.76	0.40
Uniform Delay, d1	43.3	37.9		52.5	50.0		49.5	49.4	43.9	48.9	53.0	50.0
Progression Factor	1.09	1.19		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	5.4	2.8		8.0	52.6		16.3	15.3	0.2	0.2	9.8	0.4
Delay (s)	52.7	47.9		60.5	102.6		65.8	64.7	44.1	49.1	62.8	50.4
Level of Service	D	D		E	F		E	E	D	D	E	D
Approach Delay (s)		49.0			88.3			55.3			55.5	
Approach LOS		D			F			E			E	

Intersection Summary			
HCM 2000 Control Delay	62.6	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	92.3%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	409	3	60	3	0	6	68	713	0	3	491	329
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5	4.5		4.5		4.0	5.0		4.0	5.0	
Lane Util. Factor		1.00	1.00		1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00	0.98		0.98		1.00	1.00		1.00	0.98	
Flpb, ped/bikes		1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Frt		1.00	0.85		0.91		1.00	1.00		1.00	0.94	
Flt Protected		0.95	1.00		0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1792	1559		1661		1770	3505		1805	3269	
Flt Permitted		0.95	1.00		0.98		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1792	1559		1661		1770	3505		1805	3269	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	409	3	60	3	0	6	68	713	0	3	491	329
RTOR Reduction (vph)	0	0	41	0	9	0	0	0	0	0	74	0
Lane Group Flow (vph)	0	412	19	0	0	0	68	713	0	3	746	0
Confl. Peds. (#/hr)			3			1			6			11
Heavy Vehicles (%)	1%	0%	2%	0%	0%	0%	2%	3%	0%	0%	3%	1%
Turn Type	Split	NA	Perm	Split	NA		Prot	NA		Prot	NA	
Protected Phases	3	3		4	4		1	6		5	2	
Permitted Phases			3									
Actuated Green, G (s)		24.7	24.7		0.8		6.3	34.6		0.8	29.1	
Effective Green, g (s)		24.7	24.7		0.8		6.3	34.6		0.8	29.1	
Actuated g/C Ratio		0.31	0.31		0.01		0.08	0.44		0.01	0.37	
Clearance Time (s)		4.5	4.5		4.5		4.0	5.0		4.0	5.0	
Vehicle Extension (s)		2.0	2.0		2.0		2.0	3.0		2.0	3.0	
Lane Grp Cap (vph)		560	488		16		141	1537		18	1205	
v/s Ratio Prot		c0.23			c0.00		c0.04	0.20		0.00	c0.23	
v/s Ratio Perm			0.01									
v/c Ratio		0.74	0.04		0.01		0.48	0.46		0.17	0.62	
Uniform Delay, d1		24.2	18.8		38.7		34.7	15.6		38.7	20.4	
Progression Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		4.3	0.0		0.1		0.9	0.2		1.6	1.0	
Delay (s)		28.5	18.9		38.7		35.7	15.8		40.3	21.3	
Level of Service		C	B		D		D	B		D	C	
Approach Delay (s)		27.3			38.7			17.6			21.4	
Approach LOS		C			D			B			C	

Intersection Summary			
HCM 2000 Control Delay	21.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	78.9	Sum of lost time (s)	18.0
Intersection Capacity Utilization	70.3%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	109	101	80	672	510	44
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	109	101	80	672	510	44
Pedestrians	11			2	3	
Lane Width (ft)	12.0			12.0	12.0	
Walking Speed (ft/s)	4.0			4.0	4.0	
Percent Blockage	1			0	0	
Right turn flare (veh)						
Median type				TWLTL	TWLTL	
Median storage veh)				2	2	
Upstream signal (ft)					814	
pX, platoon unblocked	0.79	0.79	0.79			
vC, conflicting volume	1020	523	565			
vC1, stage 1 conf vol	521					
vC2, stage 2 conf vol	499					
vCu, unblocked vol	889	257	310			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3	2.2			
p0 queue free %	75	83	92			
cM capacity (veh/h)	432	582	982			

Direction, Lane #	EB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	210	80	336	336	510	44
Volume Left	109	80	0	0	0	0
Volume Right	101	0	0	0	0	44
cSH	493	982	1700	1700	1700	1700
Volume to Capacity	0.43	0.08	0.20	0.20	0.30	0.03
Queue Length 95th (ft)	52	7	0	0	0	0
Control Delay (s)	17.6	9.0	0.0	0.0	0.0	0.0
Lane LOS	C	A				
Approach Delay (s)	17.6	1.0			0.0	
Approach LOS	C					

Intersection Summary			
Average Delay	2.9		
Intersection Capacity Utilization	53.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	1	19	18	106	191	4
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	1	19	18	106	191	4
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	124				92	71
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	124				92	71
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				79	100
cM capacity (veh/h)	1475				912	997

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	20	124	195
Volume Left	1	0	191
Volume Right	0	106	4
cSH	1475	1700	914
Volume to Capacity	0.00	0.07	0.21
Queue Length 95th (ft)	0	0	20
Control Delay (s)	0.4	0.0	10.0
Lane LOS	A		B
Approach Delay (s)	0.4	0.0	10.0
Approach LOS			B

Intersection Summary			
Average Delay	5.8		
Intersection Capacity Utilization	25.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	71	942	490	697	747	72	367	98	327	50	71	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.0	5.0	4.0	5.0		4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95		0.95	0.95	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	0.99		1.00	1.00	0.97	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	0.97	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1805	3539	1599	3467	3477		1715	1747	1572	1805	1900	1587
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	0.97	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1805	3539	1599	3467	3477		1715	1747	1572	1805	1900	1587
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	71	942	490	697	747	72	367	98	327	50	71	20
RTOR Reduction (vph)	0	0	212	0	4	0	0	0	266	0	0	19
Lane Group Flow (vph)	71	942	278	697	815	0	231	234	61	50	71	1
Confl. Peds. (#/hr)						17			12			5
Confl. Bikes (#/hr)						1						
Heavy Vehicles (%)	0%	2%	1%	1%	2%	0%	0%	1%	0%	0%	0%	0%
Turn Type	Prot	NA	Perm	Prot	NA		Split	NA	Perm	Split	NA	Perm
Protected Phases	1	6		5	2		4	4		3	3	
Permitted Phases			6						4			3
Actuated Green, G (s)	7.9	35.1	35.1	28.8	56.0		20.6	20.6	20.6	7.5	7.5	7.5
Effective Green, g (s)	7.9	35.1	35.1	28.8	56.0		20.6	20.6	20.6	7.5	7.5	7.5
Actuated g/C Ratio	0.07	0.32	0.32	0.26	0.51		0.19	0.19	0.19	0.07	0.07	0.07
Clearance Time (s)	4.0	5.0	5.0	4.0	5.0		4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	2.0	3.0	3.0	2.0	3.0		2.0	2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	129	1129	510	907	1770		321	327	294	123	129	108
v/s Ratio Prot	0.04	c0.27		c0.20	0.23		c0.13	0.13		0.03	c0.04	
v/s Ratio Perm			0.17						0.04			0.00
v/c Ratio	0.55	0.83	0.55	0.77	0.46		0.72	0.72	0.21	0.41	0.55	0.01
Uniform Delay, d1	49.3	34.8	30.9	37.5	17.3		42.0	42.0	37.8	49.1	49.6	47.8
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.9	7.3	4.2	3.6	0.9		6.3	6.1	0.1	0.8	2.9	0.0
Delay (s)	52.2	42.1	35.0	41.1	18.2		48.3	48.0	37.9	49.9	52.5	47.8
Level of Service	D	D	D	D	B		D	D	D	D	D	D
Approach Delay (s)		40.3			28.7			43.9			50.9	
Approach LOS		D			C			D			D	

Intersection Summary			
HCM 2000 Control Delay	36.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	77.6%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	183	1317	269	229	1336	182	362	375	248	273	327	167
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.0	5.0	4.0	5.0		4.0	5.0		4.0	5.0	5.0
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91		0.97	0.95		0.97	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.95	1.00	1.00		1.00	0.99		1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.98		1.00	0.94		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3467	5085	1541	3502	4977		3467	3319		3467	3574	1520
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3467	5085	1541	3502	4977		3467	3319		3467	3574	1520
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	183	1317	269	229	1336	182	362	375	248	273	327	167
RTOR Reduction (vph)	0	0	146	0	11	0	0	103	0	0	0	138
Lane Group Flow (vph)	183	1317	123	229	1507	0	362	520	0	273	327	29
Confl. Peds. (#/hr)			28			5			16			18
Confl. Bikes (#/hr)			1			1						
Heavy Vehicles (%)	1%	2%	0%	0%	2%	3%	1%	1%	1%	1%	1%	3%
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA		Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2									4
Actuated Green, G (s)	12.8	56.3	56.3	12.5	56.0		16.7	24.0		14.2	21.5	21.5
Effective Green, g (s)	12.8	56.3	56.3	12.5	56.0		16.7	24.0		14.2	21.5	21.5
Actuated g/C Ratio	0.10	0.45	0.45	0.10	0.45		0.13	0.19		0.11	0.17	0.17
Clearance Time (s)	4.0	5.0	5.0	4.0	5.0		4.0	5.0		4.0	5.0	5.0
Vehicle Extension (s)	2.0	3.0	3.0	2.0	3.0		2.0	2.0		2.0	2.0	2.0
Lane Grp Cap (vph)	355	2290	694	350	2229		463	637		393	614	261
v/s Ratio Prot	0.05	c0.26		0.07	c0.30		c0.10	c0.16		0.08	0.09	
v/s Ratio Perm			0.08									0.02
v/c Ratio	0.52	0.58	0.18	0.65	0.68		0.78	0.82		0.69	0.53	0.11
Uniform Delay, d1	53.2	25.5	20.5	54.2	27.3		52.4	48.4		53.3	47.2	43.7
Progression Factor	1.00	1.00	1.00	1.35	0.60		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.5	1.1	0.6	0.3	0.2		7.7	7.5		4.3	0.4	0.1
Delay (s)	53.7	26.5	21.1	73.3	16.7		60.1	55.9		57.6	47.6	43.7
Level of Service	D	C	C	E	B		E	E		E	D	D
Approach Delay (s)		28.5			24.1			57.5			50.3	
Approach LOS		C			C			E			D	

Intersection Summary			
HCM 2000 Control Delay	35.6	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	125.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	79.7%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	1288	545	0	1707	0	318
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	1288	545	0	1707	0	318
Pedestrians				1	11	
Lane Width (ft)				12.0	12.0	
Walking Speed (ft/s)				4.0	4.0	
Percent Blockage				0	1	
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)				624		
pX, platoon unblocked					0.85	
vC, conflicting volume			1844		2140	714
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1844		1724	714
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	15
cM capacity (veh/h)			331		69	375

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1
Volume Total	515	515	803	569	569	569	318
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	545	0	0	0	318
cSH	1700	1700	1700	1700	1700	1700	375
Volume to Capacity	0.30	0.30	0.47	0.33	0.33	0.33	0.85
Queue Length 95th (ft)	0	0	0	0	0	0	199
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	50.1
Lane LOS							F
Approach Delay (s)	0.0			0.0			50.1
Approach LOS							F

Intersection Summary			
Average Delay	4.1		
Intersection Capacity Utilization	63.9%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	386	1000	220	443	882	63	597	188	415	58	219	227
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.0		4.0	5.0		4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	1.00	0.91		0.97	0.95		0.95	0.95	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	0.98	1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.97		1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	0.97	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	4976		3433	3527		1698	1741	1573	1687	1863	1519
Flt Permitted	0.95	1.00		0.95	1.00		0.95	0.97	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	4976		3433	3527		1698	1741	1573	1687	1863	1519
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	386	1000	220	443	882	63	597	188	415	58	219	227
RTOR Reduction (vph)	0	25	0	0	4	0	0	0	317	0	0	133
Lane Group Flow (vph)	386	1195	0	443	941	0	388	397	98	58	219	94
Confl. Peds. (#/hr)						6			2			15
Confl. Bikes (#/hr)			1						2			
Heavy Vehicles (%)	2%	1%	2%	2%	1%	2%	1%	1%	1%	7%	2%	3%
Turn Type	Prot	NA		Prot	NA		Split	NA	Perm	Split	NA	Perm
Protected Phases	5	2		1	6		3	3		4	4	
Permitted Phases									3			4
Actuated Green, G (s)	32.1	39.1		19.0	26.0		29.5	29.5	29.5	19.4	19.4	19.4
Effective Green, g (s)	32.1	39.1		19.0	26.0		29.5	29.5	29.5	19.4	19.4	19.4
Actuated g/C Ratio	0.26	0.31		0.15	0.21		0.24	0.24	0.24	0.16	0.16	0.16
Clearance Time (s)	4.0	5.0		4.0	5.0		4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	2.0	3.0		2.0	3.0		2.0	2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	454	1556		521	733		400	410	371	261	289	235
v/s Ratio Prot	c0.22	0.24		0.13	c0.27		c0.23	0.23		0.03	c0.12	
v/s Ratio Perm									0.06			0.06
v/c Ratio	0.85	0.77		0.85	1.28		0.97	0.97	0.26	0.22	0.76	0.40
Uniform Delay, d1	44.2	38.9		51.6	49.5		47.3	47.3	38.9	46.2	50.6	47.5
Progression Factor	1.03	0.92		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	12.6	3.4		12.1	138.0		36.5	35.6	0.1	0.2	9.7	0.4
Delay (s)	58.0	39.2		63.8	187.5		83.8	82.9	39.0	46.4	60.2	47.9
Level of Service	E	D		E	F		F	F	D	D	E	D
Approach Delay (s)		43.7			148.0			68.0			53.1	
Approach LOS		D			F			E			D	

Intersection Summary			
HCM 2000 Control Delay	81.7	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	0.97		
Actuated Cycle Length (s)	125.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	100.9%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	547	1	74	3	1	8	86	645	3	20	448	414
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5	4.5		4.5		4.0	5.0		4.0	5.0	
Lane Util. Factor		1.00	1.00		1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00	0.98		1.00		1.00	1.00		1.00	0.98	
Flpb, ped/bikes		1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Frt		1.00	0.85		0.91		1.00	1.00		1.00	0.93	
Flt Protected		0.95	1.00		0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1792	1578		1708		1805	3537		1703	3213	
Flt Permitted		0.95	1.00		0.99		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1792	1578		1708		1805	3537		1703	3213	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	547	1	74	3	1	8	86	645	3	20	448	414
RTOR Reduction (vph)	0	0	47	0	8	0	0	0	0	0	122	0
Lane Group Flow (vph)	0	548	27	0	4	0	86	648	0	20	740	0
Confl. Peds. (#/hr)			8						3			6
Confl. Bikes (#/hr)									1			2
Heavy Vehicles (%)	1%	0%	0%	0%	0%	0%	0%	2%	0%	6%	4%	1%
Turn Type	Split	NA	Perm	Split	NA		Prot	NA		Prot	NA	
Protected Phases	3	3		4	4		1	6		5	2	
Permitted Phases			3									
Actuated Green, G (s)		35.2	35.2		1.8		7.2	38.1		1.7	32.6	
Effective Green, g (s)		35.2	35.2		1.8		7.2	38.1		1.7	32.6	
Actuated g/C Ratio		0.37	0.37		0.02		0.08	0.40		0.02	0.34	
Clearance Time (s)		4.5	4.5		4.5		4.0	5.0		4.0	5.0	
Vehicle Extension (s)		2.0	2.0		2.0		2.0	3.0		2.0	3.0	
Lane Grp Cap (vph)		665	585		32		137	1421		30	1104	
v/s Ratio Prot		c0.31			c0.00		c0.05	0.18		0.01	c0.23	
v/s Ratio Perm			0.02									
v/c Ratio		0.82	0.05		0.13		0.63	0.46		0.67	0.67	
Uniform Delay, d1		27.0	19.1		45.7		42.5	20.8		46.3	26.5	
Progression Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		7.8	0.0		0.7		6.3	0.2		35.7	1.6	
Delay (s)		34.8	19.1		46.4		48.8	21.0		81.9	28.1	
Level of Service		C	B		D		D	C		F	C	
Approach Delay (s)		32.9			46.4			24.3			29.4	
Approach LOS		C			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	28.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	94.8	Sum of lost time (s)	18.0
Intersection Capacity Utilization	79.3%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	192	116	96	541	436	88
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	192	116	96	541	436	88
Pedestrians	2			1		
Lane Width (ft)	12.0			12.0		
Walking Speed (ft/s)	4.0			4.0		
Percent Blockage	0			0		
Right turn flare (veh)						
Median type				TWLTL	TWLTL	
Median storage veh)				2	2	
Upstream signal (ft)					814	
pX, platoon unblocked	0.80	0.80	0.80			
vC, conflicting volume	900	439	526			
vC1, stage 1 conf vol	438					
vC2, stage 2 conf vol	462					
vCu, unblocked vol	755	181	289			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3	2.2			
p0 queue free %	59	83	91			
cM capacity (veh/h)	472	671	1031			

Direction, Lane #	EB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	308	96	270	270	436	88
Volume Left	192	96	0	0	0	0
Volume Right	116	0	0	0	0	88
cSH	531	1031	1700	1700	1700	1700
Volume to Capacity	0.58	0.09	0.16	0.16	0.26	0.05
Queue Length 95th (ft)	92	8	0	0	0	0
Control Delay (s)	20.7	8.8	0.0	0.0	0.0	0.0
Lane LOS	C	A				
Approach Delay (s)	20.7	1.3			0.0	
Approach LOS	C					

Intersection Summary			
Average Delay	4.9		
Intersection Capacity Utilization	56.0%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	0	3	3	182	305	3
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	3	3	182	305	3
Pedestrians			2			
Lane Width (ft)			12.0			
Walking Speed (ft/s)			4.0			
Percent Blockage			0			
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	185				99	94
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	185				99	94
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				66	100
cM capacity (veh/h)	1402				903	968

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	3	185	308
Volume Left	0	0	305
Volume Right	0	182	3
cSH	1402	1700	904
Volume to Capacity	0.00	0.11	0.34
Queue Length 95th (ft)	0	0	38
Control Delay (s)	0.0	0.0	11.0
Lane LOS			B
Approach Delay (s)	0.0	0.0	11.0
Approach LOS			B

Intersection Summary			
Average Delay	6.8		
Intersection Capacity Utilization	35.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	64	896	391	446	676	47	443	43	501	48	49	39
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.0	5.0	4.0	5.0		4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95		0.95	0.95	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00		1.00	1.00	0.97	1.00	1.00	0.95
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	0.96	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1805	3574	1594	3467	3526		1698	1720	1555	1719	1900	1531
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	0.96	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1805	3574	1594	3467	3526		1698	1720	1555	1719	1900	1531
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	64	896	391	446	676	47	443	43	501	48	49	39
RTOR Reduction (vph)	0	0	156	0	3	0	0	0	385	0	0	37
Lane Group Flow (vph)	64	896	235	446	720	0	244	242	116	48	49	2
Confl. Peds. (#/hr)			1			16			12			37
Confl. Bikes (#/hr)						2			1			
Heavy Vehicles (%)	0%	1%	0%	1%	1%	0%	1%	0%	1%	5%	0%	0%
Turn Type	Prot	NA	Perm	Prot	NA		Split	NA	Perm	Split	NA	Perm
Protected Phases	1	6		5	2		4	4		3	3	
Permitted Phases			6						4			3
Actuated Green, G (s)	7.6	44.3	44.3	18.4	55.1		22.7	22.7	22.7	6.6	6.6	6.6
Effective Green, g (s)	7.6	44.3	44.3	18.4	55.1		22.7	22.7	22.7	6.6	6.6	6.6
Actuated g/C Ratio	0.07	0.40	0.40	0.17	0.50		0.21	0.21	0.21	0.06	0.06	0.06
Clearance Time (s)	4.0	5.0	5.0	4.0	5.0		4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	2.0	3.0	3.0	2.0	3.0		2.0	2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	124	1439	641	579	1766		350	354	320	103	114	91
v/s Ratio Prot	0.04	c0.25		c0.13	0.20		c0.14	0.14		c0.03	0.03	
v/s Ratio Perm			0.15						0.07			0.00
v/c Ratio	0.52	0.62	0.37	0.77	0.41		0.70	0.68	0.36	0.47	0.43	0.03
Uniform Delay, d1	49.4	26.2	23.0	43.8	17.2		40.5	40.3	37.4	50.0	49.9	48.7
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.5	2.0	1.6	5.7	0.7		4.8	4.3	0.3	1.2	0.9	0.0
Delay (s)	50.9	28.2	24.6	49.5	17.9		45.3	44.6	37.7	51.2	50.8	48.7
Level of Service	D	C	C	D	B		D	D	D	D	D	D
Approach Delay (s)		28.3			30.0			41.3			50.4	
Approach LOS		C			C			D			D	

Intersection Summary			
HCM 2000 Control Delay	33.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	87.9%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Appendix F Intersection Queuing Analysis

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	138	972	205	233	996	260	573	179	369	124
v/c Ratio	0.29	0.39	0.24	0.67	0.44	0.70	0.84	0.61	0.66	0.36
Control Delay	52.3	22.5	3.9	51.6	21.1	65.6	52.3	66.0	57.1	10.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	52.3	22.5	3.9	51.6	21.1	65.6	52.3	66.0	57.1	10.2
Queue Length 50th (ft)	53	182	0	99	224	110	202	76	155	0
Queue Length 95th (ft)	90	267	49	132	327	152	254	112	198	51
Internal Link Dist (ft)		1203			1406		927		578	
Turn Bay Length (ft)	150		275	250		175		175		200
Base Capacity (vph)	481	2498	843	511	2285	528	1045	528	1044	531
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.29	0.39	0.24	0.46	0.44	0.49	0.55	0.34	0.35	0.23

Intersection Summary

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	1145	278	0	1146	0	168
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Hourly flow rate (vph)	1301	316	0	1302	0	191
Pedestrians					23	
Lane Width (ft)					12.0	
Walking Speed (ft/s)					4.0	
Percent Blockage					2	
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)				624		
pX, platoon unblocked					0.88	
vC, conflicting volume			1640		1916	615
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1640		1564	615
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	56
cM capacity (veh/h)			393		90	431

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1
Volume Total	520	520	576	434	434	434	191
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	316	0	0	0	191
cSH	1700	1700	1700	1700	1700	1700	431
Volume to Capacity	0.31	0.31	0.34	0.26	0.26	0.26	0.44
Queue Length 95th (ft)	0	0	0	0	0	0	56
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	19.8
Lane LOS							C
Approach Delay (s)	0.0			0.0			19.8
Approach LOS							C

Intersection Summary			
Average Delay	1.2		
Intersection Capacity Utilization	45.8%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	315	1112	389	760	250	260	453	60	185	188
v/c Ratio	0.75	0.58	0.70	0.71	0.79	0.79	0.68	0.26	0.74	0.56
Control Delay	61.5	42.4	58.9	45.8	67.6	66.9	9.5	51.4	70.7	20.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	61.5	42.4	58.9	45.8	67.6	66.9	9.5	51.4	70.7	20.0
Queue Length 50th (ft)	256	328	161	301	211	220	0	46	152	31
Queue Length 95th (ft)	#403	395	217	#449	303	313	95	84	221	101
Internal Link Dist (ft)		544		3388		389			1096	
Turn Bay Length (ft)	250		250		225			130		75
Base Capacity (vph)	422	1906	560	1077	381	396	706	415	445	477
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.75	0.58	0.69	0.71	0.66	0.66	0.64	0.14	0.42	0.39

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	EBR	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	347	51	7	58	614	2	702
v/c Ratio	0.60	0.09	0.03	0.23	0.39	0.01	0.56
Control Delay	25.6	2.3	0.2	34.0	13.2	37.5	16.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	25.6	2.3	0.2	34.0	13.2	37.5	16.6
Queue Length 50th (ft)	102	0	0	19	57	1	85
Queue Length 95th (ft)	285	11	0	74	197	9	220
Internal Link Dist (ft)	173		405		734		389
Turn Bay Length (ft)				125		85	
Base Capacity (vph)	1243	1104	727	891	2402	909	2218
Starvation Cap Reductn	0	0	0	0	0	0	6
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.28	0.05	0.01	0.07	0.26	0.00	0.32

Intersection Summary

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	86	80	63	532	403	35
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	97	90	71	598	453	39
Pedestrians	11			2	3	
Lane Width (ft)	12.0			12.0	12.0	
Walking Speed (ft/s)	4.0			4.0	4.0	
Percent Blockage	1			0	0	
Right turn flare (veh)						
Median type				TWLTL	TWLTL	
Median storage veh)				2	2	
Upstream signal (ft)					814	
pX, platoon unblocked	0.83	0.83	0.83			
vC, conflicting volume	907	466	503			
vC1, stage 1 conf vol	464					
vC2, stage 2 conf vol	443					
vCu, unblocked vol	788	257	302			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3	2.2			
p0 queue free %	80	85	93			
cM capacity (veh/h)	475	616	1047			

Direction, Lane #	EB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	187	71	299	299	453	39
Volume Left	97	71	0	0	0	0
Volume Right	90	0	0	0	0	39
cSH	534	1047	1700	1700	1700	1700
Volume to Capacity	0.35	0.07	0.18	0.18	0.27	0.02
Queue Length 95th (ft)	39	5	0	0	0	0
Control Delay (s)	15.3	8.7	0.0	0.0	0.0	0.0
Lane LOS	C	A				
Approach Delay (s)	15.3	0.9			0.0	
Approach LOS	C					

Intersection Summary			
Average Delay	2.6		
Intersection Capacity Utilization	44.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	1	15	14	84	151	3
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	1	17	16	94	170	3
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	110				82	63
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	110				82	63
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				82	100
cM capacity (veh/h)	1493				924	1007

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	18	110	173
Volume Left	1	0	170
Volume Right	0	94	3
cSH	1493	1700	926
Volume to Capacity	0.00	0.06	0.19
Queue Length 95th (ft)	0	0	17
Control Delay (s)	0.5	0.0	9.8
Lane LOS	A		A
Approach Delay (s)	0.5	0.0	9.8
Approach LOS			A

Intersection Summary			
Average Delay	5.6		
Intersection Capacity Utilization	21.1%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	61	810	421	600	703	198	202	282	43	61	17
v/c Ratio	0.41	0.57	0.51	0.80	0.36	0.70	0.70	0.57	0.32	0.43	0.08
Control Delay	56.2	30.7	10.8	49.4	17.2	56.0	55.9	9.1	53.9	57.6	0.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	56.2	30.7	10.8	49.4	17.2	56.0	55.9	9.1	53.9	57.6	0.8
Queue Length 50th (ft)	42	241	52	205	146	141	143	0	29	42	0
Queue Length 95th (ft)	83	#364	170	270	250	205	208	67	65	83	0
Internal Link Dist (ft)		3388			277		1252			356	
Turn Bay Length (ft)	150		150	300		200		200	40		60
Base Capacity (vph)	328	1413	825	753	1938	444	452	616	221	233	286
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.19	0.57	0.51	0.80	0.36	0.45	0.45	0.46	0.19	0.26	0.06

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	153	1094	224	191	1263	302	519	227	273	139
v/c Ratio	0.44	0.42	0.25	0.61	0.51	0.72	0.82	0.66	0.55	0.42
Control Delay	57.0	21.4	3.6	83.6	15.1	62.9	48.6	63.1	53.8	11.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	57.0	21.4	3.6	83.6	15.1	62.9	48.6	63.1	53.8	11.2
Queue Length 50th (ft)	60	197	0	85	89	122	165	92	110	0
Queue Length 95th (ft)	95	289	49	m88	131	166	216	131	147	56
Internal Link Dist (ft)		1203			1406		927		578	
Turn Bay Length (ft)	150		275	250		175		175		200
Base Capacity (vph)	360	2579	891	448	2475	526	1097	526	1086	558
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.42	0.42	0.25	0.43	0.51	0.57	0.47	0.43	0.25	0.25

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	1024	422	0	1348	0	248
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	1101	454	0	1449	0	267
Pedestrians				1	11	
Lane Width (ft)				12.0	12.0	
Walking Speed (ft/s)				4.0	4.0	
Percent Blockage				0	1	
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)				624		
pX, platoon unblocked					0.86	
vC, conflicting volume			1566		1822	606
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1566		1392	606
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	39
cM capacity (veh/h)			423		116	441

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1
Volume Total	440	440	674	483	483	483	267
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	454	0	0	0	267
cSH	1700	1700	1700	1700	1700	1700	441
Volume to Capacity	0.26	0.26	0.40	0.28	0.28	0.28	0.61
Queue Length 95th (ft)	0	0	0	0	0	0	97
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	24.9
Lane LOS							C
Approach Delay (s)	0.0			0.0			24.9
Approach LOS							C

Intersection Summary			
Average Delay	2.0		
Intersection Capacity Utilization	51.7%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	322	1017	366	789	321	329	343	48	182	189
v/c Ratio	0.72	0.59	0.66	0.88	0.87	0.87	0.56	0.21	0.73	0.55
Control Delay	48.1	28.9	56.3	57.9	70.6	70.2	7.9	48.3	67.9	17.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.1	28.9	56.3	57.9	70.6	70.2	7.9	48.3	67.9	17.5
Queue Length 50th (ft)	160	155	146	331	258	265	0	35	144	23
Queue Length 95th (ft)	#383	217	201	#500	#408	#414	78	69	210	90
Internal Link Dist (ft)		544		3388		389			1096	
Turn Bay Length (ft)	250		250		225			130		75
Base Capacity (vph)	445	1733	551	894	400	410	633	411	454	490
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.72	0.59	0.66	0.88	0.80	0.80	0.54	0.12	0.40	0.39

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	EBR	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	454	62	9	70	546	17	723
v/c Ratio	0.70	0.10	0.05	0.30	0.37	0.10	0.63
Control Delay	28.1	0.3	31.5	40.3	17.6	43.4	19.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	28.1	0.3	31.5	40.3	17.6	43.4	19.5
Queue Length 50th (ft)	147	0	1	25	61	6	90
Queue Length 95th (ft)	400	0	19	97	212	38	252
Internal Link Dist (ft)	173		405		734		389
Turn Bay Length (ft)				125		85	
Base Capacity (vph)	1420	1271	199	378	2510	178	2127
Starvation Cap Reductn	0	0	0	0	0	0	18
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.32	0.05	0.05	0.19	0.22	0.10	0.34

Intersection Summary

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	152	92	76	427	345	70
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	162	98	81	454	367	74
Pedestrians	2			1		
Lane Width (ft)	12.0			12.0		
Walking Speed (ft/s)	4.0			4.0		
Percent Blockage	0			0		
Right turn flare (veh)						
Median type				TWLTL	TWLTL	
Median storage veh)				2	2	
Upstream signal (ft)					814	
pX, platoon unblocked	0.87	0.87	0.87			
vC, conflicting volume	758	370	443			
vC1, stage 1 conf vol	369					
vC2, stage 2 conf vol	389					
vCu, unblocked vol	646	199	284			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3	2.2			
p0 queue free %	70	86	93			
cM capacity (veh/h)	532	706	1119			

Direction, Lane #	EB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	260	81	227	227	367	74
Volume Left	162	81	0	0	0	0
Volume Right	98	0	0	0	0	74
cSH	586	1119	1700	1700	1700	1700
Volume to Capacity	0.44	0.07	0.13	0.13	0.22	0.04
Queue Length 95th (ft)	56	6	0	0	0	0
Control Delay (s)	15.9	8.5	0.0	0.0	0.0	0.0
Lane LOS	C	A				
Approach Delay (s)	15.9	1.3			0.0	
Approach LOS	C					

Intersection Summary			
Average Delay	3.9		
Intersection Capacity Utilization	46.5%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	0	2	2	144	242	2
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84
Hourly flow rate (vph)	0	2	2	171	288	2
Pedestrians			2			
Lane Width (ft)			12.0			
Walking Speed (ft/s)			4.0			
Percent Blockage			0			
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	174				92	88
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	174				92	88
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				68	100
cM capacity (veh/h)	1415				911	976

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	2	174	290
Volume Left	0	0	288
Volume Right	0	171	2
cSH	1415	1700	911
Volume to Capacity	0.00	0.10	0.32
Queue Length 95th (ft)	0	0	34
Control Delay (s)	0.0	0.0	10.8
Lane LOS			B
Approach Delay (s)	0.0	0.0	10.8
Approach LOS			B

Intersection Summary			
Average Delay	6.7		
Intersection Capacity Utilization	29.2%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	53	738	322	368	594	201	199	414	40	41	32
v/c Ratio	0.37	0.44	0.36	0.73	0.30	0.69	0.67	0.68	0.35	0.32	0.16
Control Delay	55.2	23.4	7.0	53.8	16.3	54.2	53.2	9.7	56.7	55.0	1.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	55.2	23.4	7.0	53.8	16.3	54.2	53.2	9.7	56.7	55.0	1.7
Queue Length 50th (ft)	36	184	24	129	119	141	138	0	28	28	0
Queue Length 95th (ft)	76	302	106	172	203	205	203	81	62	63	0
Internal Link Dist (ft)		3388			277		1252			356	
Turn Bay Length (ft)	150		150	300		200		200	40		60
Base Capacity (vph)	262	1684	889	541	1970	439	445	709	273	302	331
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.20	0.44	0.36	0.68	0.30	0.46	0.45	0.58	0.15	0.14	0.10

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	138	976	205	234	1000	260	575	180	369	124
v/c Ratio	0.29	0.39	0.24	0.67	0.44	0.70	0.84	0.61	0.66	0.36
Control Delay	52.3	22.6	3.9	51.6	20.9	65.6	52.2	65.9	57.0	10.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	52.3	22.6	3.9	51.6	20.9	65.6	52.2	65.9	57.0	10.2
Queue Length 50th (ft)	53	183	0	100	223	110	201	76	155	0
Queue Length 95th (ft)	90	269	49	m133	328	152	254	112	198	51
Internal Link Dist (ft)		1203			1406		927		578	
Turn Bay Length (ft)	150		275	250		175		175		200
Base Capacity (vph)	481	2497	842	511	2285	528	1047	528	1044	531
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.29	0.39	0.24	0.46	0.44	0.49	0.55	0.34	0.35	0.23

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	1140	288	0	1151	0	173
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Hourly flow rate (vph)	1295	327	0	1308	0	197
Pedestrians					23	
Lane Width (ft)					12.0	
Walking Speed (ft/s)					4.0	
Percent Blockage					2	
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)				624		
pX, platoon unblocked					0.88	
vC, conflicting volume			1646		1918	618
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1646		1562	618
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	54
cM capacity (veh/h)			391		90	428

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1
Volume Total	518	518	586	436	436	436	197
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	327	0	0	0	197
cSH	1700	1700	1700	1700	1700	1700	428
Volume to Capacity	0.30	0.30	0.34	0.26	0.26	0.26	0.46
Queue Length 95th (ft)	0	0	0	0	0	0	59
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	20.3
Lane LOS							C
Approach Delay (s)	0.0			0.0			20.3
Approach LOS							C

Intersection Summary			
Average Delay	1.3		
Intersection Capacity Utilization	46.3%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	315	1112	392	760	255	264	457	60	186	188
v/c Ratio	0.74	0.59	0.70	0.71	0.79	0.79	0.68	0.26	0.74	0.56
Control Delay	61.6	42.7	59.2	46.3	67.5	66.4	9.4	51.4	71.1	20.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	61.6	42.7	59.2	46.3	67.5	66.4	9.4	51.4	71.1	20.3
Queue Length 50th (ft)	260	332	162	305	214	221	0	46	153	32
Queue Length 95th (ft)	#402	394	219	#449	309	318	95	84	222	102
Internal Link Dist (ft)		544		3388		389			1096	
Turn Bay Length (ft)	250		250		225			130		75
Base Capacity (vph)	423	1892	560	1066	381	397	709	415	445	477
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.74	0.59	0.70	0.71	0.67	0.66	0.64	0.14	0.42	0.39

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	EBR	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	356	52	7	59	614	2	707
v/c Ratio	0.63	0.10	0.03	0.25	0.37	0.01	0.59
Control Delay	27.1	2.3	0.2	35.4	13.2	38.5	17.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.1	2.3	0.2	35.4	13.2	38.5	17.9
Queue Length 50th (ft)	106	0	0	20	60	1	87
Queue Length 95th (ft)	292	11	0	76	203	9	226
Internal Link Dist (ft)	173		405		734		389
Turn Bay Length (ft)				125		85	
Base Capacity (vph)	1118	1002	680	825	2243	842	2073
Starvation Cap Reductn	0	0	0	0	0	0	6
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.32	0.05	0.01	0.07	0.27	0.00	0.34

Intersection Summary

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	86	80	63	533	404	35
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	97	90	71	599	454	39
Pedestrians	11			2	3	
Lane Width (ft)	12.0			12.0	12.0	
Walking Speed (ft/s)	4.0			4.0	4.0	
Percent Blockage	1			0	0	
Right turn flare (veh)						
Median type				TWLTL	TWLTL	
Median storage veh)				2	2	
Upstream signal (ft)					814	
pX, platoon unblocked	0.83	0.83	0.83			
vC, conflicting volume	909	467	504			
vC1, stage 1 conf vol	465					
vC2, stage 2 conf vol	444					
vCu, unblocked vol	788	255	300			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3	2.2			
p0 queue free %	80	85	93			
cM capacity (veh/h)	475	616	1046			

Direction, Lane #	EB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	187	71	299	299	454	39
Volume Left	97	71	0	0	0	0
Volume Right	90	0	0	0	0	39
cSH	534	1046	1700	1700	1700	1700
Volume to Capacity	0.35	0.07	0.18	0.18	0.27	0.02
Queue Length 95th (ft)	39	5	0	0	0	0
Control Delay (s)	15.3	8.7	0.0	0.0	0.0	0.0
Lane LOS	C	A				
Approach Delay (s)	15.3	0.9			0.0	
Approach LOS	C					

Intersection Summary			
Average Delay	2.6		
Intersection Capacity Utilization	44.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	1	15	14	84	151	3
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	1	17	16	94	170	3
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	110				82	63
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	110				82	63
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				82	100
cM capacity (veh/h)	1493				924	1007

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	18	110	173
Volume Left	1	0	170
Volume Right	0	94	3
cSH	1493	1700	926
Volume to Capacity	0.00	0.06	0.19
Queue Length 95th (ft)	0	0	17
Control Delay (s)	0.5	0.0	9.8
Lane LOS	A		A
Approach Delay (s)	0.5	0.0	9.8
Approach LOS			A

Intersection Summary			
Average Delay	5.6		
Intersection Capacity Utilization	21.1%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	61	812	422	600	705	199	202	282	43	61	17
v/c Ratio	0.41	0.58	0.51	0.80	0.36	0.70	0.70	0.57	0.32	0.43	0.08
Control Delay	56.2	30.8	10.9	49.4	17.3	56.0	55.6	9.1	53.9	57.6	0.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	56.2	30.8	10.9	49.4	17.3	56.0	55.6	9.1	53.9	57.6	0.8
Queue Length 50th (ft)	42	242	52	205	146	141	143	0	29	42	0
Queue Length 95th (ft)	83	#366	171	270	251	206	208	67	65	83	0
Internal Link Dist (ft)		3388			277		1252			356	
Turn Bay Length (ft)	150		150	300		200		200	40		60
Base Capacity (vph)	328	1411	824	752	1936	444	452	616	221	233	286
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.19	0.58	0.51	0.80	0.36	0.45	0.45	0.46	0.19	0.26	0.06

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	153	1099	224	192	1267	302	520	228	273	139
v/c Ratio	0.43	0.43	0.25	0.61	0.51	0.72	0.82	0.65	0.55	0.42
Control Delay	56.7	21.5	3.6	83.5	15.3	62.9	48.6	62.9	53.7	11.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	56.7	21.5	3.6	83.5	15.3	62.9	48.6	62.9	53.7	11.1
Queue Length 50th (ft)	60	198	0	85	90	122	165	92	110	0
Queue Length 95th (ft)	95	292	49	m88	131	166	216	131	147	56
Internal Link Dist (ft)		1203			1406		927		578	
Turn Bay Length (ft)	150		275	250		175		175		200
Base Capacity (vph)	360	2574	890	448	2465	526	1097	526	1086	558
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.42	0.43	0.25	0.43	0.51	0.57	0.47	0.43	0.25	0.25

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	1019	435	0	1353	0	253
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	1096	468	0	1455	0	272
Pedestrians				1	11	
Lane Width (ft)				12.0	12.0	
Walking Speed (ft/s)				4.0	4.0	
Percent Blockage				0	1	
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)				624		
pX, platoon unblocked					0.86	
vC, conflicting volume			1574		1826	611
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1574		1395	611
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	38
cM capacity (veh/h)			420		115	437

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1
Volume Total	438	438	687	485	485	485	272
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	468	0	0	0	272
cSH	1700	1700	1700	1700	1700	1700	437
Volume to Capacity	0.26	0.26	0.40	0.29	0.29	0.29	0.62
Queue Length 95th (ft)	0	0	0	0	0	0	103
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	25.9
Lane LOS							D
Approach Delay (s)	0.0			0.0			25.9
Approach LOS							D

Intersection Summary			
Average Delay	2.1		
Intersection Capacity Utilization	52.2%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	322	1017	371	789	324	332	346	48	183	189
v/c Ratio	0.73	0.59	0.67	0.89	0.88	0.88	0.56	0.21	0.73	0.56
Control Delay	48.2	29.0	56.6	58.4	71.2	70.7	7.9	48.2	68.1	17.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.2	29.0	56.6	58.4	71.2	70.7	7.9	48.2	68.1	17.7
Queue Length 50th (ft)	159	155	148	331	262	268	0	35	144	23
Queue Length 95th (ft)	#382	218	203	#500	#414	#422	79	69	211	91
Internal Link Dist (ft)		544		3388		389			1096	
Turn Bay Length (ft)	250		250		225			130		75
Base Capacity (vph)	444	1727	551	891	400	410	635	411	454	489
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.73	0.59	0.67	0.89	0.81	0.81	0.54	0.12	0.40	0.39

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	EBR	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	464	63	9	72	546	17	728
v/c Ratio	0.71	0.10	0.05	0.31	0.37	0.10	0.63
Control Delay	28.7	0.3	32.4	41.4	17.8	44.6	19.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	28.7	0.3	32.4	41.4	17.8	44.6	19.7
Queue Length 50th (ft)	153	0	1	27	63	6	93
Queue Length 95th (ft)	420	0	20	102	215	38	257
Internal Link Dist (ft)	173		405		734		389
Turn Bay Length (ft)				125		85	
Base Capacity (vph)	1401	1256	196	372	2477	175	2104
Starvation Cap Reductn	0	0	0	0	0	0	28
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.33	0.05	0.05	0.19	0.22	0.10	0.35

Intersection Summary

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	152	92	76	429	346	70
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	162	98	81	456	368	74
Pedestrians	2			1		
Lane Width (ft)	12.0			12.0		
Walking Speed (ft/s)	4.0			4.0		
Percent Blockage	0			0		
Right turn flare (veh)						
Median type				TWLTL	TWLTL	
Median storage veh)				2	2	
Upstream signal (ft)					814	
pX, platoon unblocked	0.87	0.87	0.87			
vC, conflicting volume	760	371	445			
vC1, stage 1 conf vol	370					
vC2, stage 2 conf vol	390					
vCu, unblocked vol	647	198	283			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3	2.2			
p0 queue free %	70	86	93			
cM capacity (veh/h)	531	706	1118			

Direction, Lane #	EB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	260	81	228	228	368	74
Volume Left	162	81	0	0	0	0
Volume Right	98	0	0	0	0	74
cSH	586	1118	1700	1700	1700	1700
Volume to Capacity	0.44	0.07	0.13	0.13	0.22	0.04
Queue Length 95th (ft)	57	6	0	0	0	0
Control Delay (s)	15.9	8.5	0.0	0.0	0.0	0.0
Lane LOS	C	A				
Approach Delay (s)	15.9	1.3			0.0	
Approach LOS	C					

Intersection Summary			
Average Delay	3.9		
Intersection Capacity Utilization	46.5%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	0	2	2	144	242	2
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84
Hourly flow rate (vph)	0	2	2	171	288	2
Pedestrians			2			
Lane Width (ft)			12.0			
Walking Speed (ft/s)			4.0			
Percent Blockage			0			
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	174				92	88
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	174				92	88
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				68	100
cM capacity (veh/h)	1415				911	976

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	2	174	290
Volume Left	0	0	288
Volume Right	0	171	2
cSH	1415	1700	911
Volume to Capacity	0.00	0.10	0.32
Queue Length 95th (ft)	0	0	34
Control Delay (s)	0.0	0.0	10.8
Lane LOS			B
Approach Delay (s)	0.0	0.0	10.8
Approach LOS			B

Intersection Summary			
Average Delay	6.7		
Intersection Capacity Utilization	29.2%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	53	740	323	368	597	201	200	414	40	41	32
v/c Ratio	0.37	0.44	0.36	0.73	0.30	0.69	0.68	0.68	0.35	0.32	0.16
Control Delay	55.2	23.4	7.0	53.8	16.3	54.2	53.4	9.7	56.7	55.0	1.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	55.2	23.4	7.0	53.8	16.3	54.2	53.4	9.7	56.7	55.0	1.7
Queue Length 50th (ft)	36	184	24	129	120	141	140	0	28	28	0
Queue Length 95th (ft)	76	302	106	172	204	205	204	81	62	63	0
Internal Link Dist (ft)		3388			277		1252			356	
Turn Bay Length (ft)	150		150	300		200		200	40		60
Base Capacity (vph)	262	1684	889	541	1970	439	445	709	273	302	331
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.20	0.44	0.36	0.68	0.30	0.46	0.45	0.58	0.15	0.14	0.10

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	164	1154	244	276	1181	308	680	212	438	148
v/c Ratio	0.36	0.52	0.31	0.70	0.56	0.73	0.86	0.65	0.66	0.37
Control Delay	54.8	29.2	4.6	41.8	24.8	65.4	52.2	65.8	53.7	9.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	54.8	29.2	4.6	41.8	24.8	65.4	52.2	65.8	53.7	9.0
Queue Length 50th (ft)	65	254	0	108	350	130	248	90	182	0
Queue Length 95th (ft)	105	363	59	m122	m355	175	301	128	225	55
Internal Link Dist (ft)		1203			1406		927		578	
Turn Bay Length (ft)	150		275	250		175		175		200
Base Capacity (vph)	458	2222	794	511	2109	528	1045	528	1044	547
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.36	0.52	0.31	0.54	0.56	0.58	0.65	0.40	0.42	0.27

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	1445	351	0	1447	0	212
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	1445	351	0	1447	0	212
Pedestrians					23	
Lane Width (ft)					12.0	
Walking Speed (ft/s)					4.0	
Percent Blockage					2	
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)				624		
pX, platoon unblocked					0.82	
vC, conflicting volume			1819		2126	680
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1819		1611	680
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	46
cM capacity (veh/h)			335		78	390

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1
Volume Total	578	578	640	482	482	482	212
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	351	0	0	0	212
cSH	1700	1700	1700	1700	1700	1700	390
Volume to Capacity	0.34	0.34	0.38	0.28	0.28	0.28	0.54
Queue Length 95th (ft)	0	0	0	0	0	0	78
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	24.6
Lane LOS							C
Approach Delay (s)	0.0			0.0			24.6
Approach LOS							C

Intersection Summary			
Average Delay	1.5		
Intersection Capacity Utilization	56.0%	ICU Level of Service	B
Analysis Period (min)	15		

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	366	1291	452	882	291	302	526	69	215	218
v/c Ratio	0.75	0.74	0.81	1.06	0.84	0.84	0.71	0.26	0.76	0.61
Control Delay	58.6	48.3	64.7	96.9	71.1	70.3	9.4	49.5	69.4	24.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	58.6	48.3	64.7	96.9	71.1	70.3	9.4	49.5	69.4	24.5
Queue Length 50th (ft)	305	402	191	~433	243	252	0	52	177	54
Queue Length 95th (ft)	#532	#495	#263	#567	#376	#384	106	93	249	131
Internal Link Dist (ft)		544		3388		389			1096	
Turn Bay Length (ft)	250		250		225			130		75
Base Capacity (vph)	489	1739	560	829	381	396	762	415	445	477
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.75	0.74	0.81	1.06	0.76	0.76	0.69	0.17	0.48	0.46

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	EBR	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	403	59	9	67	713	3	815
v/c Ratio	0.68	0.10	0.04	0.32	0.42	0.02	0.64
Control Delay	30.2	2.9	0.3	40.5	14.8	41.7	20.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	30.2	2.9	0.3	40.5	14.8	41.7	20.6
Queue Length 50th (ft)	155	0	0	28	88	1	129
Queue Length 95th (ft)	343	16	0	86	250	12	290
Internal Link Dist (ft)	173		405		734		389
Turn Bay Length (ft)				125		85	
Base Capacity (vph)	989	896	590	697	2096	711	1845
Starvation Cap Reductn	0	0	0	0	0	0	12
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.41	0.07	0.02	0.10	0.34	0.00	0.44

Intersection Summary

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	109	101	80	672	509	44
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	109	101	80	672	509	44
Pedestrians	11			2	3	
Lane Width (ft)	12.0			12.0	12.0	
Walking Speed (ft/s)	4.0			4.0	4.0	
Percent Blockage	1			0	0	
Right turn flare (veh)						
Median type				TWLTL	TWLTL	
Median storage veh)				2	2	
Upstream signal (ft)					814	
pX, platoon unblocked	0.79	0.79	0.79			
vC, conflicting volume	1019	522	564			
vC1, stage 1 conf vol	520					
vC2, stage 2 conf vol	499					
vCu, unblocked vol	889	259	312			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3	2.2			
p0 queue free %	75	83	92			
cM capacity (veh/h)	433	582	983			

Direction, Lane #	EB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	210	80	336	336	509	44
Volume Left	109	80	0	0	0	0
Volume Right	101	0	0	0	0	44
cSH	493	983	1700	1700	1700	1700
Volume to Capacity	0.43	0.08	0.20	0.20	0.30	0.03
Queue Length 95th (ft)	52	7	0	0	0	0
Control Delay (s)	17.6	9.0	0.0	0.0	0.0	0.0
Lane LOS	C	A				
Approach Delay (s)	17.6	1.0			0.0	
Approach LOS	C					

Intersection Summary			
Average Delay	2.9		
Intersection Capacity Utilization	53.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	1	19	18	106	191	4
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	1	19	18	106	191	4
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	124				92	71
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	124				92	71
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				79	100
cM capacity (veh/h)	1475				912	997

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	20	124	195
Volume Left	1	0	191
Volume Right	0	106	4
cSH	1475	1700	914
Volume to Capacity	0.00	0.07	0.21
Queue Length 95th (ft)	0	0	20
Control Delay (s)	0.4	0.0	10.0
Lane LOS	A		B
Approach Delay (s)	0.4	0.0	10.0
Approach LOS			B

Intersection Summary			
Average Delay	5.8		
Intersection Capacity Utilization	25.0%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	71	940	489	697	817	231	233	327	50	71	20
v/c Ratio	0.46	0.81	0.67	0.77	0.45	0.72	0.71	0.58	0.35	0.47	0.09
Control Delay	57.0	42.3	17.5	45.2	20.8	53.9	53.3	8.3	53.9	58.3	0.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	57.0	42.3	17.5	45.2	20.8	53.9	53.3	8.3	53.9	58.3	0.8
Queue Length 50th (ft)	49	333	108	231	193	162	163	0	34	49	0
Queue Length 95th (ft)	93	#483	246	#395	322	229	230	69	71	93	0
Internal Link Dist (ft)		3388			277		1252			356	
Turn Bay Length (ft)	150		150	300		200		200	40		60
Base Capacity (vph)	328	1157	732	908	1828	446	454	650	221	233	286
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.22	0.81	0.67	0.77	0.45	0.52	0.51	0.50	0.23	0.30	0.07

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	183	1312	269	228	1514	362	622	273	327	167
v/c Ratio	0.52	0.57	0.32	0.65	0.67	0.78	0.84	0.70	0.53	0.42
Control Delay	58.8	28.4	4.6	73.2	17.2	64.7	49.2	62.7	49.7	9.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	58.8	28.4	4.6	73.2	17.2	64.7	49.2	62.7	49.7	9.2
Queue Length 50th (ft)	73	282	2	97	131	147	207	111	128	0
Queue Length 95th (ft)	111	404	62	m67	m257	197	260	152	162	56
Internal Link Dist (ft)		1203			1406		927		578	
Turn Bay Length (ft)	150		275	250		175		175		200
Base Capacity (vph)	360	2295	840	449	2247	526	1097	526	1086	578
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.51	0.57	0.32	0.51	0.67	0.69	0.57	0.52	0.30	0.29

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	1293	533	0	1702	0	313
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	1293	533	0	1702	0	313
Pedestrians				1	11	
Lane Width (ft)				12.0	12.0	
Walking Speed (ft/s)				4.0	4.0	
Percent Blockage				0	1	
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)				624		
pX, platoon unblocked					0.85	
vC, conflicting volume			1837		2138	710
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1837		1721	710
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	17
cM capacity (veh/h)			333		69	377

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1
Volume Total	517	517	792	567	567	567	313
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	533	0	0	0	313
cSH	1700	1700	1700	1700	1700	1700	377
Volume to Capacity	0.30	0.30	0.47	0.33	0.33	0.33	0.83
Queue Length 95th (ft)	0	0	0	0	0	0	189
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	47.2
Lane LOS							E
Approach Delay (s)	0.0			0.0			47.2
Approach LOS							E

Intersection Summary			
Average Delay	3.8		
Intersection Capacity Utilization	63.4%	ICU Level of Service	B
Analysis Period (min)	15		

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	386	1220	439	945	385	394	412	58	218	227
v/c Ratio	0.85	0.77	0.84	1.28	0.96	0.96	0.60	0.22	0.76	0.62
Control Delay	62.7	39.0	67.1	177.4	84.9	84.0	7.8	46.2	66.6	22.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	62.7	39.0	67.1	177.4	84.9	84.0	7.8	46.2	66.6	22.5
Queue Length 50th (ft)	207	189	180	~511	326	332	0	42	171	49
Queue Length 95th (ft)	#539	#424	#260	#645	#533	#542	87	78	241	126
Internal Link Dist (ft)		544		3388		389			1096	
Turn Bay Length (ft)	250		250		225			130		75
Base Capacity (vph)	456	1586	521	737	400	410	685	411	454	490
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.85	0.77	0.84	1.28	0.96	0.96	0.60	0.14	0.48	0.46

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	EBR	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	539	73	12	83	648	20	832
v/c Ratio	0.77	0.11	0.08	0.42	0.44	0.15	0.70
Control Delay	34.8	0.9	37.4	53.7	22.9	55.5	25.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.8	0.9	37.4	53.7	22.9	55.5	25.8
Queue Length 50th (ft)	238	0	2	41	103	10	146
Queue Length 95th (ft)	519	5	25	124	285	45	337
Internal Link Dist (ft)	173		405		734		389
Turn Bay Length (ft)				125		85	
Base Capacity (vph)	1192	1087	156	291	2123	137	1812
Starvation Cap Reductn	0	0	0	0	0	0	34
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.45	0.07	0.08	0.29	0.31	0.15	0.47

Intersection Summary

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	192	116	96	539	436	88
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	192	116	96	539	436	88
Pedestrians	2			1		
Lane Width (ft)	12.0			12.0		
Walking Speed (ft/s)	4.0			4.0		
Percent Blockage	0			0		
Right turn flare (veh)						
Median type				TWLTL	TWLTL	
Median storage veh)				2	2	
Upstream signal (ft)					814	
pX, platoon unblocked	0.81	0.81	0.81			
vC, conflicting volume	900	439	526			
vC1, stage 1 conf vol	438					
vC2, stage 2 conf vol	462					
vCu, unblocked vol	754	183	291			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3	2.2			
p0 queue free %	59	83	91			
cM capacity (veh/h)	472	671	1031			

Direction, Lane #	EB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	308	96	270	270	436	88
Volume Left	192	96	0	0	0	0
Volume Right	116	0	0	0	0	88
cSH	531	1031	1700	1700	1700	1700
Volume to Capacity	0.58	0.09	0.16	0.16	0.26	0.05
Queue Length 95th (ft)	91	8	0	0	0	0
Control Delay (s)	20.7	8.8	0.0	0.0	0.0	0.0
Lane LOS	C	A				
Approach Delay (s)	20.7	1.3			0.0	
Approach LOS	C					

Intersection Summary			
Average Delay	4.9		
Intersection Capacity Utilization	56.0%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	0	3	3	182	305	3
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	3	3	182	305	3
Pedestrians			2			
Lane Width (ft)			12.0			
Walking Speed (ft/s)			4.0			
Percent Blockage			0			
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	185				99	94
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	185				99	94
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				66	100
cM capacity (veh/h)	1402				903	968

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	3	185	308
Volume Left	0	0	305
Volume Right	0	182	3
cSH	1402	1700	904
Volume to Capacity	0.00	0.11	0.34
Queue Length 95th (ft)	0	0	38
Control Delay (s)	0.0	0.0	11.0
Lane LOS			B
Approach Delay (s)	0.0	0.0	11.0
Approach LOS			B

Intersection Summary			
Average Delay	6.8		
Intersection Capacity Utilization	35.2%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	64	894	390	446	720	243	242	501	48	49	39
v/c Ratio	0.43	0.61	0.48	0.77	0.39	0.70	0.68	0.71	0.39	0.36	0.19
Control Delay	56.5	30.9	12.1	53.3	20.4	50.3	49.5	9.8	57.7	55.7	2.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	56.5	30.9	12.1	53.3	20.4	50.3	49.5	9.8	57.7	55.7	2.1
Queue Length 50th (ft)	44	267	60	155	165	168	167	9	33	34	0
Queue Length 95th (ft)	86	#442	180	210	280	233	231	99	70	71	0
Internal Link Dist (ft)		3388			277		1252			356	
Turn Bay Length (ft)	150		150	300		200		200	40		60
Base Capacity (vph)	262	1470	809	588	1825	449	455	768	273	302	331
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.24	0.61	0.48	0.76	0.39	0.54	0.53	0.65	0.18	0.16	0.12

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	164	1156	244	277	1185	308	681	213	438	148
v/c Ratio	0.37	0.52	0.31	0.70	0.56	0.73	0.86	0.65	0.66	0.37
Control Delay	55.3	29.2	4.6	41.8	24.6	65.4	52.1	65.9	53.7	9.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	55.3	29.2	4.6	41.8	24.6	65.4	52.1	65.9	53.7	9.0
Queue Length 50th (ft)	67	254	0	109	350	130	247	90	182	0
Queue Length 95th (ft)	105	364	59	m122	m355	175	301	129	225	55
Internal Link Dist (ft)		1203			1406		927		578	
Turn Bay Length (ft)	150		275	250		175		175		200
Base Capacity (vph)	447	2221	794	511	2123	528	1047	528	1044	547
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.37	0.52	0.31	0.54	0.56	0.58	0.65	0.40	0.42	0.27

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	1440	361	0	1452	0	217
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	1440	361	0	1452	0	217
Pedestrians					23	
Lane Width (ft)					12.0	
Walking Speed (ft/s)					4.0	
Percent Blockage					2	
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)				624		
pX, platoon unblocked					0.82	
vC, conflicting volume			1824		2128	684
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1824		1619	684
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	44
cM capacity (veh/h)			333		78	389

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1
Volume Total	576	576	649	484	484	484	217
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	361	0	0	0	217
cSH	1700	1700	1700	1700	1700	1700	389
Volume to Capacity	0.34	0.34	0.38	0.28	0.28	0.28	0.56
Queue Length 95th (ft)	0	0	0	0	0	0	82
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	25.4
Lane LOS							D
Approach Delay (s)	0.0			0.0			25.4
Approach LOS							D

Intersection Summary			
Average Delay	1.6		
Intersection Capacity Utilization	56.4%	ICU Level of Service	B
Analysis Period (min)	15		

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	366	1291	455	882	295	304	529	69	216	218
v/c Ratio	0.75	0.75	0.81	1.07	0.85	0.84	0.71	0.26	0.76	0.61
Control Delay	59.0	48.7	65.1	98.4	71.2	69.6	9.4	49.4	69.3	24.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	59.0	48.7	65.1	98.4	71.2	69.6	9.4	49.4	69.3	24.6
Queue Length 50th (ft)	305	402	193	~433	247	253	0	52	177	55
Queue Length 95th (ft)	#536	#497	#267	#567	#385	#389	105	92	249	132
Internal Link Dist (ft)		544		3388		389			1096	
Turn Bay Length (ft)	250		250		225			130		75
Base Capacity (vph)	486	1725	560	825	381	396	765	415	445	477
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.75	0.75	0.81	1.07	0.77	0.77	0.69	0.17	0.49	0.46

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	EBR	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	412	60	9	68	713	3	820
v/c Ratio	0.68	0.10	0.04	0.33	0.43	0.02	0.65
Control Delay	30.2	3.0	0.3	41.1	15.1	42.0	21.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	30.2	3.0	0.3	41.1	15.1	42.0	21.0
Queue Length 50th (ft)	160	0	0	29	92	1	134
Queue Length 95th (ft)	353	16	0	87	250	12	291
Internal Link Dist (ft)	173		405		734		389
Turn Bay Length (ft)				125		85	
Base Capacity (vph)	968	879	580	683	2059	696	1811
Starvation Cap Reductn	0	0	0	0	0	0	12
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.43	0.07	0.02	0.10	0.35	0.00	0.46

Intersection Summary

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	109	101	80	672	510	44
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	109	101	80	672	510	44
Pedestrians	11			2	3	
Lane Width (ft)	12.0			12.0	12.0	
Walking Speed (ft/s)	4.0			4.0	4.0	
Percent Blockage	1			0	0	
Right turn flare (veh)						
Median type				TWLTL	TWLTL	
Median storage veh)				2	2	
Upstream signal (ft)					814	
pX, platoon unblocked	0.79	0.79	0.79			
vC, conflicting volume	1020	523	565			
vC1, stage 1 conf vol	521					
vC2, stage 2 conf vol	499					
vCu, unblocked vol	889	257	310			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3	2.2			
p0 queue free %	75	83	92			
cM capacity (veh/h)	432	582	982			

Direction, Lane #	EB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	210	80	336	336	510	44
Volume Left	109	80	0	0	0	0
Volume Right	101	0	0	0	0	44
cSH	493	982	1700	1700	1700	1700
Volume to Capacity	0.43	0.08	0.20	0.20	0.30	0.03
Queue Length 95th (ft)	52	7	0	0	0	0
Control Delay (s)	17.6	9.0	0.0	0.0	0.0	0.0
Lane LOS	C	A				
Approach Delay (s)	17.6	1.0			0.0	
Approach LOS	C					

Intersection Summary			
Average Delay	2.9		
Intersection Capacity Utilization	53.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	1	19	18	106	191	4
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	1	19	18	106	191	4
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	124				92	71
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	124				92	71
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				79	100
cM capacity (veh/h)	1475				912	997

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	20	124	195
Volume Left	1	0	191
Volume Right	0	106	4
cSH	1475	1700	914
Volume to Capacity	0.00	0.07	0.21
Queue Length 95th (ft)	0	0	20
Control Delay (s)	0.4	0.0	10.0
Lane LOS	A		B
Approach Delay (s)	0.4	0.0	10.0
Approach LOS			B

Intersection Summary			
Average Delay	5.8		
Intersection Capacity Utilization	25.0%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	71	942	490	697	819	231	234	327	50	71	20
v/c Ratio	0.46	0.81	0.67	0.77	0.45	0.72	0.72	0.58	0.35	0.47	0.09
Control Delay	57.0	42.4	17.6	45.2	20.8	53.9	53.4	8.3	53.9	58.3	0.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	57.0	42.4	17.6	45.2	20.8	53.9	53.4	8.3	53.9	58.3	0.8
Queue Length 50th (ft)	49	334	109	231	193	162	164	0	34	49	0
Queue Length 95th (ft)	93	#484	247	#395	323	229	231	69	71	93	0
Internal Link Dist (ft)		3388			277		1252			356	
Turn Bay Length (ft)	150		150	300		200		200	40		60
Base Capacity (vph)	328	1157	732	908	1828	446	454	650	221	233	286
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.22	0.81	0.67	0.77	0.45	0.52	0.52	0.50	0.23	0.30	0.07

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	183	1314	269	229	1518	362	623	273	327	167
v/c Ratio	0.52	0.57	0.32	0.65	0.68	0.78	0.84	0.70	0.53	0.42
Control Delay	58.8	28.5	4.6	73.3	17.4	64.7	49.1	62.7	49.6	9.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	58.8	28.5	4.6	73.3	17.4	64.7	49.1	62.7	49.6	9.1
Queue Length 50th (ft)	73	282	2	97	132	147	207	111	128	0
Queue Length 95th (ft)	111	405	62	m67	m258	197	260	152	162	56
Internal Link Dist (ft)		1203			1406		927		578	
Turn Bay Length (ft)	150		275	250		175		175		200
Base Capacity (vph)	360	2292	839	449	2243	526	1097	526	1086	578
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.51	0.57	0.32	0.51	0.68	0.69	0.57	0.52	0.30	0.29

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	1288	545	0	1707	0	318
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	1288	545	0	1707	0	318
Pedestrians				1	11	
Lane Width (ft)				12.0	12.0	
Walking Speed (ft/s)				4.0	4.0	
Percent Blockage				0	1	
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)				624		
pX, platoon unblocked					0.85	
vC, conflicting volume			1844		2140	714
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1844		1724	714
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	15
cM capacity (veh/h)			331		69	375

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1
Volume Total	515	515	803	569	569	569	318
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	545	0	0	0	318
cSH	1700	1700	1700	1700	1700	1700	375
Volume to Capacity	0.30	0.30	0.47	0.33	0.33	0.33	0.85
Queue Length 95th (ft)	0	0	0	0	0	0	199
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	50.1
Lane LOS							F
Approach Delay (s)	0.0			0.0			50.1
Approach LOS							F

Intersection Summary			
Average Delay	4.1		
Intersection Capacity Utilization	63.9%	ICU Level of Service	B
Analysis Period (min)	15		

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	386	1220	442	945	388	397	415	58	219	227
v/c Ratio	0.85	0.77	0.85	1.28	0.97	0.97	0.60	0.22	0.76	0.62
Control Delay	63.3	39.3	67.6	177.4	85.7	84.8	7.7	46.1	66.5	22.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	63.3	39.3	67.6	177.4	85.7	84.8	7.7	46.1	66.5	22.7
Queue Length 50th (ft)	207	190	181	~511	328	336	0	42	172	50
Queue Length 95th (ft)	#542	#426	#263	#645	#541	#549	88	78	243	127
Internal Link Dist (ft)		544		3388		389			1096	
Turn Bay Length (ft)	250		250		225			130		75
Base Capacity (vph)	454	1579	521	737	400	410	688	411	454	490
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.85	0.77	0.85	1.28	0.97	0.97	0.60	0.14	0.48	0.46

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	EBR	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	548	74	12	84	648	20	836
v/c Ratio	0.78	0.11	0.08	0.43	0.44	0.15	0.70
Control Delay	35.3	1.0	37.6	54.2	23.1	55.9	26.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.3	1.0	37.6	54.2	23.1	55.9	26.0
Queue Length 50th (ft)	246	0	2	42	105	10	149
Queue Length 95th (ft)	532	5	25	125	285	45	338
Internal Link Dist (ft)	173		405		734		389
Turn Bay Length (ft)				125		85	
Base Capacity (vph)	1183	1080	155	288	2108	136	1795
Starvation Cap Reductn	0	0	0	0	0	0	34
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.46	0.07	0.08	0.29	0.31	0.15	0.47

Intersection Summary

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	192	116	96	541	436	88
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	192	116	96	541	436	88
Pedestrians	2			1		
Lane Width (ft)	12.0			12.0		
Walking Speed (ft/s)	4.0			4.0		
Percent Blockage	0			0		
Right turn flare (veh)						
Median type				TWLTL	TWLTL	
Median storage veh)				2	2	
Upstream signal (ft)					814	
pX, platoon unblocked	0.80	0.80	0.80			
vC, conflicting volume	900	439	526			
vC1, stage 1 conf vol	438					
vC2, stage 2 conf vol	462					
vCu, unblocked vol	755	181	289			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3	2.2			
p0 queue free %	59	83	91			
cM capacity (veh/h)	472	671	1031			

Direction, Lane #	EB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	308	96	270	270	436	88
Volume Left	192	96	0	0	0	0
Volume Right	116	0	0	0	0	88
cSH	531	1031	1700	1700	1700	1700
Volume to Capacity	0.58	0.09	0.16	0.16	0.26	0.05
Queue Length 95th (ft)	92	8	0	0	0	0
Control Delay (s)	20.7	8.8	0.0	0.0	0.0	0.0
Lane LOS	C	A				
Approach Delay (s)	20.7	1.3			0.0	
Approach LOS	C					

Intersection Summary			
Average Delay	4.9		
Intersection Capacity Utilization	56.0%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	0	3	3	182	305	3
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Hourly flow rate (vph)	0	3	3	182	305	3
Pedestrians			2			
Lane Width (ft)			12.0			
Walking Speed (ft/s)			4.0			
Percent Blockage			0			
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	185				99	94
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	185				99	94
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				66	100
cM capacity (veh/h)	1402				903	968

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	3	185	308
Volume Left	0	0	305
Volume Right	0	182	3
cSH	1402	1700	904
Volume to Capacity	0.00	0.11	0.34
Queue Length 95th (ft)	0	0	38
Control Delay (s)	0.0	0.0	11.0
Lane LOS			B
Approach Delay (s)	0.0	0.0	11.0
Approach LOS			B

Intersection Summary			
Average Delay	6.8		
Intersection Capacity Utilization	35.2%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	64	896	391	446	722	244	242	501	48	49	39
v/c Ratio	0.43	0.61	0.48	0.77	0.40	0.70	0.68	0.71	0.39	0.36	0.19
Control Delay	56.5	30.9	12.2	53.4	20.5	50.3	49.4	9.7	57.7	55.7	2.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	56.5	30.9	12.2	53.4	20.5	50.3	49.4	9.7	57.7	55.7	2.1
Queue Length 50th (ft)	44	269	61	155	166	169	167	9	33	34	0
Queue Length 95th (ft)	86	#443	181	211	281	234	231	99	70	71	0
Internal Link Dist (ft)		3388			277		1252			356	
Turn Bay Length (ft)	150		150	300		200		200	40		60
Base Capacity (vph)	262	1469	809	587	1823	449	455	768	273	302	331
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.24	0.61	0.48	0.76	0.40	0.54	0.53	0.65	0.18	0.16	0.12

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.