CITY OF POMONA

CITY OF POMONA GENERAL PLAN UPDATE, CORRIDORS SPECIFIC PLAN, ACTIVE TRANSPORTATION PLAN AND GREEN PLAN

Volume II

Final

Environmental Impact Report Appendices

rincon

March 2014

Environmental Scientists Planners Engineers

CITY OF POMONA

CITY OF POMONA GENERAL PLAN UPDATE, CORRIDORS SPECIFIC PLAN, ACTIVE TRANSPORTATION PLAN AND GREEN PLAN

Volume II

Final

Environmental Impact Report Appendices

Prepared for

City of Pomona
505 South Garey Avenue, Box 660
Pomona, California 91769

Prepared by

Rincon Consultants, Inc.
180 N. Ashwood Avenue
Ventura, California 93003

March 2014

Appendix A Notice of Preparation and Comment Letters

City of Pomona
2011 General Plan Update
and
Pomona Corridors Specific Plan

Notice of Preparation
of a
Draft Environmental
Impact Report

The City of Pomona will be the Lead Agency for the preparation of an environmental impact report (EIR) that will analyze the environmental impacts associated with a proposed update to the Pomona General Plan as well as the proposed Pomona Corridors Specific Plan. These two related actions are described below.

2011 General Plan Update

The proposed project involves the first comprehensive update of the City's General Plan since 1976. Each of the General Plan elements will be updated with goals and policies that reflect the vision of Pomona that the General Plan seeks to achieve. The land use map will also be updated. The draft 2011 General Plan includes the following seven components:

- Land Use & Density
- Economic Development
- Open Space Network
- Mobility & Access
- Conservation
- Community Design
- Noise & Safety

Pomona is nearly built out. The General Plan Housing Element indicates that, as of January 2008, there were 103 vacant acres in the City. This represents less than 1% of the total developable land, excluding streets and public lands.

Overall, the General Plan emphasizes a renewed Downtown and redefined corridors. These corridors once represented the development pattern created by the pre-freeway network of arterial highways. Today these streets remain important connectors between districts within and outside the City, serving vehicular traffic, transit, and some pedestrian routes; none of the corridors currently provides bicycle lanes. Proposed land use revisions within these corridors would be consistent with those proposed as part of the Pomona Corridors Specific Plan, as discussed below.

The most substantive changes to the land use map involve the establishment of land use density/intensity standards by transect zone. The “transect” is a system of classification for built environments, and uses the concept of place types that range from rural to urban. Each transect includes a range of development density/intensity, as well as maximum permitted heights and a mix of allowable uses. The principal aspect of transect planning is that it incorporates a variety of residential and commercial uses into a single neighborhood. A typical neighborhood would consist of a core that is mostly dominated by commercial uses, and would include a mix of residential uses that would decrease in intensity and density farther from the core. Every element of the built environment has a place in the transect.

The vision established by the updated General Plan places a greater emphasis on building form and character in districts and neighborhoods to allow a mix of land uses. The Plan identifies changes in the geographic distribution of land designated for certain land uses within the City; however, the Plan does not anticipate substantial changes in the proportion of land within the City that is occupied by various land uses. Only a moderate rate of growth is anticipated for the City, with most growth consisting of redevelopment and more efficient use of land.

Pomona Corridors Specific Plan

The Pomona Corridors Specific Plan is intended to provide a framework for private and public investment activities along the Garey Avenue, Holt Avenue, Mission Boulevard, and Foothill Boulevard Corridors (see attached map). These “Corridors” have been identified in the Pomona General Plan Update as Focus Areas that “require specific planning and regulatory direction to guide projects to ensure that the General Plan vision is achieved.” The Pomona Corridors Specific Plan implements the vision, goals, and policies identified in the General Plan. The Specific Plan is organized into three primary sections.

- Community Intent
- Development Code
- City Actions

The Development Code contained within the Specific Plan would replace previous land use and development regulations contained within the Pomona Zoning Ordinance for these portions of the City. The Development Code establishes 12 Corridor Centers and Segments that serve as the basic organizing principle for the Development Standards that would be applied to all properties within the Specific Plan Area. The Development Code uses the Transect as the underlying principle of the organization for the Plan Area's Centers and Segments and the corresponding Development Standards. The primary feature of transect planning is that it incorporates a variety of commercial and residential uses into a single neighborhood. Each neighborhood, or corridor, would have a core with a mix of commercial and residential uses that would generally decrease in intensity and density farther from the core. Also, the ratio of commercial to residential uses decreases as distance from the core increases. Every parcel within the Plan Area would be regulated by its location in one or more designated Corridor Centers and Segments.

Environmental Impact Report

The Draft EIR will be a program EIR. Per the *CEQA Guidelines*, a program EIR is an EIR that may be prepared on a series of actions that can be characterized as one large project. The purpose of a program EIR is to allow the lead agency to consider broad policy alternatives and programwide mitigation measures at an early time when the agency has greater flexibility to deal with basic problems or cumulative impacts.

The EIR will examine each of the issue areas on the City's environmental checklist. Issues to be discussed include:

- Aesthetics
- Agriculture Resources
- Air Quality
- Biological Resources
- Cultural Resources
- Geology/Soils
- Hazards & Hazardous Materials
- Hydrology/Water Quality
- Land Use/Planning
- Mineral Resources
- Noise
- Population/Housing
- Public Services
- Recreation
- Transportation/Traffic
- Utilities/Service Systems
- Mandatory Findings of Significance

In addition to the CEQA-required "no project" alternative, the EIR will examine a range of land use scenarios that address one or more of the projects' potential environmental effects.

The City of Pomona would like to know the views of your organization as to the scope and content of the environmental information that should be addressed in connection with the proposed project. Public agencies may need to use the EIR prepared by the City of Pomona when considering permits or other approvals regarding certain aspects of the proposed actions.

Due to time limits mandated by State law, your response must be sent at the earliest possible date but not later than 30 days after receipt of this notice.

Please send your response to Brad Johnson, Planning Manager, at

City of Pomona
Planning Division
505 South Garey Avenue
Pomona, California 91766

Mr. Johnson can be reached at (909) 620-2436. Mr. Johnson's email address is brad_johnson@ci.pomona.ca.us. Please provide the name for a contact person in your agency.

The City of Pomona will hold an EIR scoping meeting to provide an additional opportunity for input on the scope and content of the EIR. The scoping meeting is scheduled for Wednesday, May 16, at 7:00 p.m., in the City of Pomona Council Chambers located at 505 S. Garey Avenue.

Project Title: City of Pomona 2011 General Plan Update/Pomona Corridors Specific Plan

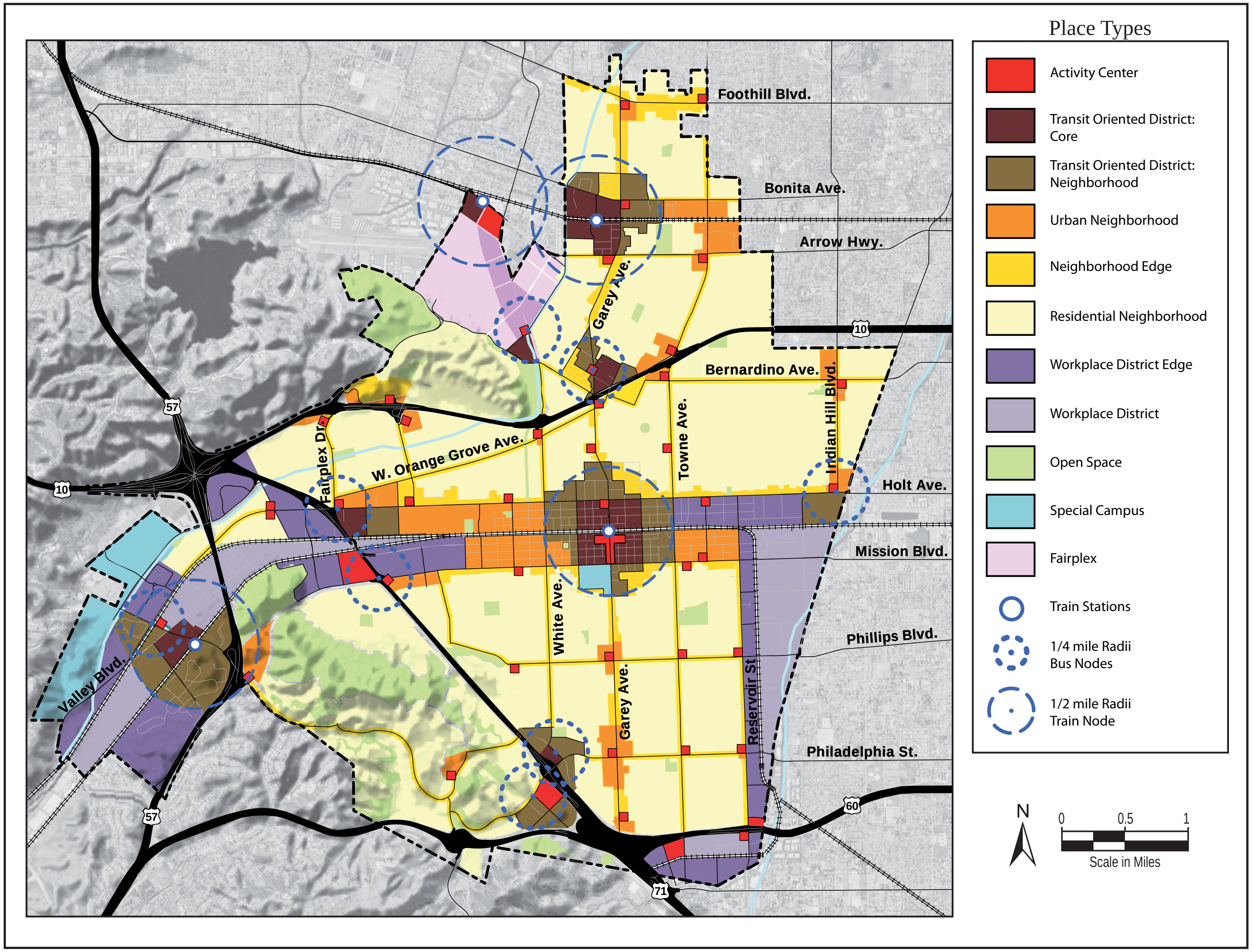
Project Sponsor: City of Pomona

Date May 2, 2012

Signature

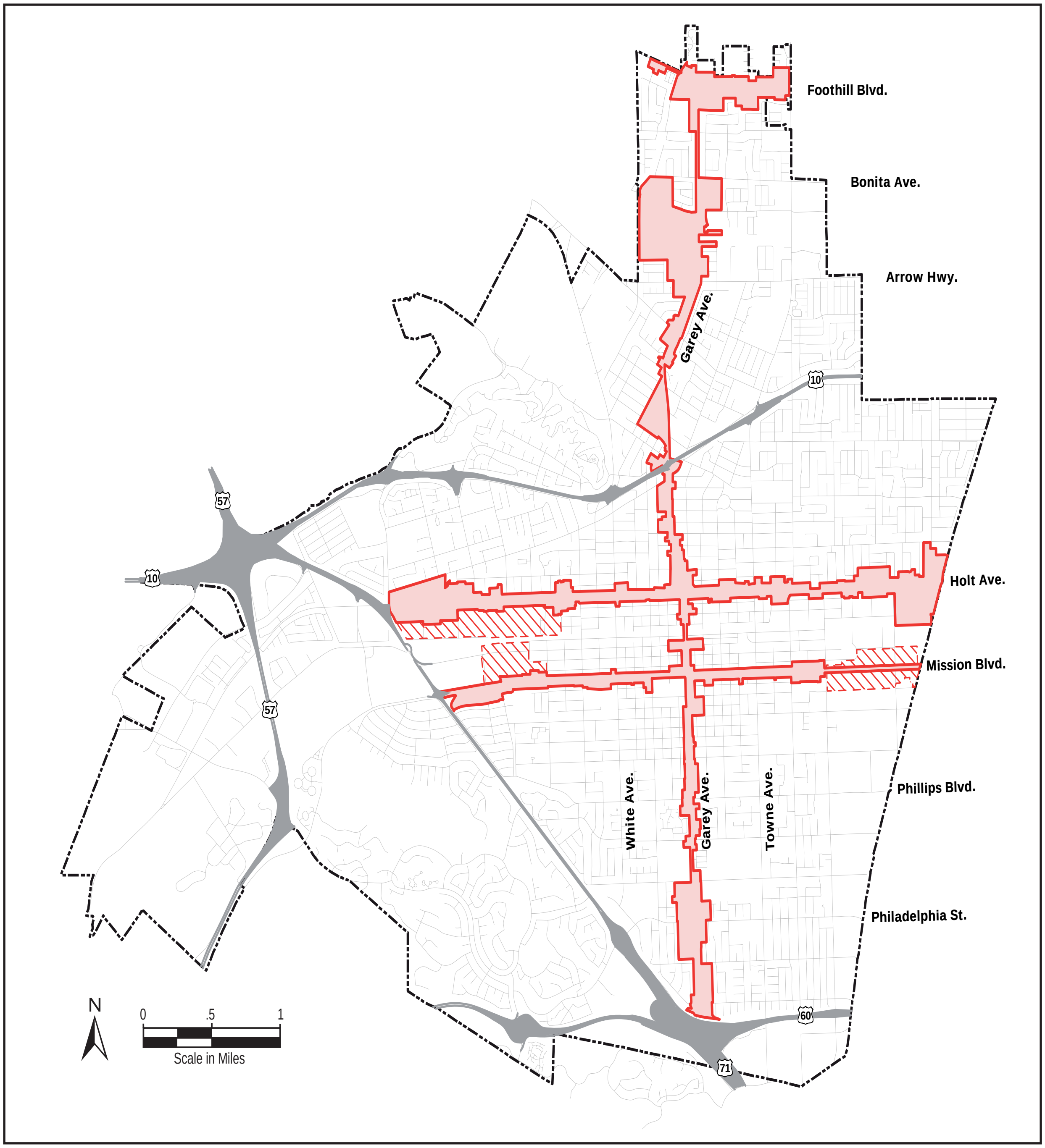
Title Planning Manager

Telephone (909) 620-2436



Source: *City of Pomona 2011 General Plan Update, March 2011.*

General Plan Land Uses



Source: Pomona Corridors Specific Plan, September, 2011.

Pomona Corridors Specific Plan Area

CALIFORNIA STATE POLYTECHNIC UNIVERSITY, POMONA

Facilities Planning and Management
Administrative Affairs

PLANNING DIVISION
2012 JUN 25 AM 11:45

June 6, 2012

Mr. Brad Johnson, Planning Manager
City of Pomona
505 Geary Avenue
Pomona, CA 91766

Re: Notice of Preparation of a Draft Environmental Impact Report
City of Pomona 2011 General Plan Update and Pomona Corridors Specific Plan

Dear Mr. Johnson,

Thank you for the opportunity to review the Notice of Preparation for a Draft Environmental Impact Report for the 2011 General Plan Update and Pomona Corridors Specific Plan. As described in the NOP the project consists of a revision to the city's current general plan, specifically substantive changes to the land use map, and the development of corridor specific plans along Garey Avenue, Holt Avenue, Mission Boulevard, and Foothill Boulevard. We agree that an Environmental Impact Report is required for this project. The university looks forward to participating in the CEQA process and reviewing the Draft Environmental Report. Please send any information to my office or if you have any questions please contact me at (909) 869-4947.

Sincerely,

Walter M. Marquez
Administrator-In-Charge
Facilities Planning and Management

DEPARTMENT OF TRANSPORTATION
DISTRICT 7, REGIONAL PLANNING
IGR/CEQA BRANCH
100 MAIN STREET, MS # 16
LOS ANGELES, CA 90012-3606
PHONE: (213) 897-9140
FAX: (213) 897-1337

PLANNING DIVISION
2012 MAY 21 PM 12: 21

Flex your power!
Be energy efficient!

May 18, 2012

Mr. Brad Johnson
City of Pomona
505 South Garey Avenue
Pomona, CA 91766

IGR/CEQA No. 120523AL-NOP
City of Pomona 2011 General Plan Update/Pomona Corridors Specific Plan
Vic. LA-57, LA-60, LA-71, I-10, City Wide
SCH # 2012051025

Dear Mr. Johnson:

Thank you for including the California Department of Transportation (Caltrans) in the environmental review process for the above referenced project. The proposed project is a General Plan Update for the City of Pomona as well as proposed Pomona Corridors Specific Plan.

Caltrans, as the State agency responsible for planning, operations, and maintenance of State highways, shares similar transportation goals with the City. In the spirit of mutual and collaborative planning, we offer our expertise in the areas of transportation modeling, mainline freeway analysis, system and corridor planning, environmental and community impact assessment, as well as identifying critical operational deficiencies affecting freeway congestion, speed, and delay.

For your information, please see excerpts below from the California Environmental Resource Evaluation System website http://ceres.ca.gov/planning/genplan/gp_chapter3.html#circulation that provides information regarding General Plans that you may find helpful:

"Caltrans is particularly interested in the transportation planning roles of local general plans and suggests that the following areas be emphasized:

- Coordination of planning efforts between local agencies and Caltrans districts.
- Preservation of transportation corridors for future system improvements; and
- Development of coordinated transportation system management plans that achieve the maximum use of present and proposed infrastructure."

Circulation Element

It is widely known that Southern California highways are heavily congested especially during morning and evening peak periods. To improve mobility there is the need for capacity enhancing projects as well as other innovative alternatives.

New development will increase use of local and regional roadways and the circulation element can identify strategies the City will pursue to maintain good levels of service. Mitigating cumulative traffic impacts may present some challenges. Given that the Los Angeles County's CMP debit and credit system has been suspended, it is recommended that the City consider an alternate local funding plan to be used towards regional transportation improvements. Local funding efforts may include a region or community wide traffic impact program. The City should consider implementing a funding program to contribute to improvements on the State highway system, including impacted I-10, SR-60, SR-57, SR-71, and on/off ramps associated with these freeways. Usually, when local matching funds are offered improvements can be streamlined and/or expedited. The City may take this opportunity to include policies that allow it to procure funds towards regional transportation improvements on State facilities within the City limits. Procuring funds toward freeway segments, freeway interchanges, freeway on/off-ramps, as well as for bus and rail transit facilities, should be included in the City's goals.

Please include Caltrans in the environmental review process of land use projects within the City General Plan area and all projects that have the potential to significantly impact traffic conditions on State highways. To avoid delays and any issues that may arise during the circulation of the DEIR, it is recommended that the City consult with Caltrans prior to the development of the traffic impact analysis.

The thresholds of significance on State highway facilities are different than those applied in the Los Angeles County Management Program (CMP). For State thresholds and guidance on the preparation of acceptable traffic studies, please refer to the Statewide Guide for the preparation of Traffic Impact Studies at:

http://www.dot.ca.gov/hq/tpp/offices/ocp/igr_ceqa_files/tisguide.pdf

If significant impacts are anticipated on the State highway system, Caltrans will work with the City and applicants to identify appropriate traffic mitigation measures. Traffic mitigation alternatives may include vehicular demand reducing strategies, such as incentives for commuters to use transit i.e. park-and-ride lots, discounts on monthly bus and rail passes, vanpools, etc.

Land Use Element

There is a critical relationship between land use and transportation. The quality of the State transportation system operation can affect the quality of the local circulation system operation. The Circulation Element of the General Plan needs to be consistent with the Land-Use and Housing Elements of the General Plan.

It is recommended that special attention be given to the jobs-and-housing balance concept. Communities with predominantly residential allocations should be encouraged to set aside areas for office, commercial/retail, and open space uses. Benefits of balanced communities include: reduction of long morning and evening commutes on State highways, shorter trips which in turn would reduce the consumption of fuel and air pollutants. It may also change direction of trips. Instead of most traffic traveling in one direction during peak periods, some trips may be diverted in the opposite direction. Other land use strategies may include Transit-Oriented Developments (TODs).

Housing Element

During the past two decades, population and economic growth has been strong in Los Angeles County. Projections show that this growth will continue, which will ultimately impact the State transportation facilities. For large development projects, efforts should be made to provide affordable housing for young workers and seniors to ensure that substantial numbers of employees can afford to purchase homes and live in proposed projects. Project proponents should be encouraged to provide information on jobs that will be created as a result of the project, along with housing development phases.

As discussed in your telephone conversation on May 15, 2012 with Alan Lin, Caltrans Project Coordinator, we would like to extend an invitation to meet with the City and the traffic consultant early in the process to discuss potential General Plan cumulative traffic impacts to the State facilities and possible mitigation measures prior to the preparation of the EIR. The goal is to mitigate any traffic impact within the City boundaries on the State facilities for all future projects.

We look forward to reviewing the traffic study and expect to receive a copy from the State Clearinghouse when the Draft EIR is completed. However, if you wish to expedite the review process please send a copy of the traffic study in advance to the undersigned.

If you have any questions, please feel free to contact me at (213) 897-9140 or Alan Lin the project coordinator at (213) 897-8391 and refer to IGR/CEQA No. 120523AL.

Sincerely,

Dianna Watson

DIANNA WATSON
IGR/CEQA Branch Chief

cc: Scott Morgan, State Clearinghouse

EDMUND G. BROWN JR.
GOVERNOR

STATE OF CALIFORNIA
GOVERNOR'S OFFICE *of* PLANNING AND RESEARCH
STATE CLEARINGHOUSE AND PLANNING UNIT

KEN ALEX
DIRECTOR

Notice of Preparation

PLANNING DIVISION
2012 MAY 10 PM 12: 16

May 7, 2012

To: Reviewing Agencies

Re: City of Ponoma 2011 General Plan Update/Pomona Corridors Specific Plan
SCH# 2012051025

Attached for your review and comment is the Notice of Preparation (NOP) for the City of Ponoma 2011 General Plan Update/Pomona Corridors Specific Plan draft Environmental Impact Report (EIR).

Responsible agencies must transmit their comments on the scope and content of the NOP, focusing on specific information related to their own statutory responsibility, within 30 days of receipt of the NOP from the Lead Agency. This is a courtesy notice provided by the State Clearinghouse with a reminder for you to comment in a timely manner. We encourage other agencies to also respond to this notice and express their concerns early in the environmental review process.

Please direct your comments to:

Brad Johnson
City of Pomona
505 South Garey Avenue
Pomona, CA 91769

with a copy to the State Clearinghouse in the Office of Planning and Research. Please refer to the SCH number noted above in all correspondence concerning this project.

If you have any questions about the environmental document review process, please call the State Clearinghouse at (916) 445-0613.

Sincerely,

Scott Morgan
Director, State Clearinghouse

Attachments
cc: Lead Agency

Document Details Report
State Clearinghouse Data Base

SCH#	**2012051025**
Project Title	City of Ponoma 2011 General Plan Update/Pomona Corridors Specific Plan
Lead Agency	Pomona, City of

Type **NOP** Notice of Preparation

Description The project involves an update to the Pomona General Plan as well as the proposed Pomona Corridors Specific Plan. The General Plan update involves an update to the first comprehensive update of the City's General Plan since 1976. Each of the General Plan elements will be updated with goals and policies that reflect the vision of Pomona that the Genera Plan seeks to achieve. The land use map will aslo be updated. The Pomona corridors Specific Plan is intended to provide a framework for private and public investment activities along the Garey Avenue, Holt Avenue, Mission boulevard, and Foothill Boulevard Corridors. These corridors have been identified in the Pomona General Plan Update as focus areas that require specific planning and regulatory direction.

Lead Agency Contact

Name Brad Johnson
Agency City of Pomona
Phone 909 620-2436 ***Fax***
email
Address 505 South Garey Avenue
City Pomona ***State*** CA ***Zip*** 91769

Project Location

County Los Angeles
City Pomona
Region
Cross Streets Citywide General Plan
Lat / Long
Parcel No. Citywide General Plan
Township ***Range*** ***Section*** ***Base***

Proximity to:

Highways I-10, SR060, SR-71
Airports Ontario
Railways SPRR
Waterways
Schools
Land Use Multiple - Project involves a General Plan Update and Corridor Specific Plan

Project Issues Aesthetic/Visual; Agricultural Land; Air Quality; Archaeologic-Historic; Biological Resources; Drainage/Absorption; Flood Plain/Flooding; Forest Land/Fire Hazard; Geologic/Seismic; Minerals; Noise; Population/Housing Balance; Public Services; Recreation/Parks; Schools/Universities; Sewer Capacity; Soil Erosion/Compaction/Grading; Solid Waste; Toxic/Hazardous; Traffic/Circulation; Vegetation; Water Quality; Water Supply; Wetland/Riparian; Growth Inducing; Landuse; Cumulative Effects

Reviewing Agencies Resources Agency; Department of Parks and Recreation; Department of Water Resources; Department of Fish and Game, Region 5; Office of Emergency Management Agency, California; Native American Heritage Commission; State Lands Commission; California Highway Patrol; Public Utilities Commission; Caltrans, Division of Aeronautics; Department of Housing and Community Development; Caltrans, District 7; Air Resources Board, Transportation Projects; Regional Water Quality Control Board, Region 4

Date Received 05/07/2012 ***Start of Review*** 05/07/2012 ***End of Review*** 06/05/2012

Note: Blanks in data fields result from insufficient information provided by lead agency.

NOP Distribution List County: Los Angeles SCH# 2012051025

Resources Agency

- [x] **Resources Agency**
Nadell Gayou
- [ ] **Dept. of Boating & Waterways**
Nicole Wong
- [ ] **California Coastal Commission**
Elizabeth A. Fuchs
- [ ] **Colorado River Board**
Gerald R. Zimmerman
- [ ] **Dept. of Conservation**
Elizabeth Carpenter
- [ ] **California Energy Commission**
Eric Knight
- [ ] **Cal Fire**
Allen Robertson
- [ ] **Central Valley Flood Protection Board**
James Herota
- [ ] **Office of Historic Preservation**
Ron Parsons
- [x] **Dept of Parks & Recreation**
Environmental Stewardship Section
- [ ] **California Department of Resources, Recycling & Recovery**
Sue O'Leary
- [ ] **S.F. Bay Conservation & Dev't. Comm.**
Steve McAdam
- [x] **Dept. of Water Resources Resources Agency**
Nadell Gayou

Fish and Game

- [ ] **Depart. of Fish & Game**
Scott Flint
Environmental Services Division
- [ ] **Fish & Game Region 1**
Donald Koch
- [ ] **Fish & Game Region 1E**
Laurie Harnsberger
- [ ] **Fish & Game Region 2**
Jeff Drongesen
- [ ] **Fish & Game Region 3**
Charles Armor
- [ ] **Fish & Game Region 4**
Julie Vance
- [x] **Fish & Game Region 5**
Leslie Newton-Reed
Habitat Conservation Program
- [ ] **Fish & Game Region 6**
Gabrina Gatchel
Habitat Conservation Program
- [ ] **Fish & Game Region 6 I/M**
Brad Henderson
Inyo/Mono, Habitat Conservation Program
- [ ] **Dept. of Fish & Game M**
George Isaac
Marine Region

Other Departments

- [ ] **Food & Agriculture**
Sandra Schubert
Dept. of Food and Agriculture
- [ ] **Depart. of General Services**
Public School Construction
- [ ] **Dept. of General Services**
Anna Garbeff
Environmental Services Section
- [ ] **Dept. of Public Health**
Bridgette Binning
Dept. of Health/Drinking Water
- [ ] **Delta Stewardship Council**
Kevan Samsam

Independent Commissions,Boards

- [ ] **Delta Protection Commission**
Michael Machado
- [x] **Cal EMA (Emergency Management Agency)**
Dennis Castrillo
- [x] **Native American Heritage Comm.**
Debbie Treadway
- [x] **Public Utilities Commission**
Leo Wong
- [ ] **Santa Monica Bay Restoration**
Guangyu Wang
- [x] **State Lands Commission**
Jennifer Deleong
- [ ] **Tahoe Regional Planning Agency (TRPA)**
Cherry Jacques

Business, Trans & Housing

- [x] **Caltrans - Division of Aeronautics**
Philip Crimmins
- [ ] **Caltrans - Planning**
Terri Pencovic
- [x] **California Highway Patrol**
Suzann Ikeuchi
Office of Special Projects
- [x] **Housing & Community Development**
CEQA Coordinator
Housing Policy Division

Dept. of Transportation

- [ ] **Caltrans, District 1**
Rex Jackman
- [ ] **Caltrans, District 2**
Marcelino Gonzalez
- [ ] **Caltrans, District 3**
Bruce de Terra
- [ ] **Caltrans, District 4**
Lisa Carboni
- [ ] **Caltrans, District 5**
David Murray
- [ ] **Caltrans, District 6**
Michael Navarro
- [x] **Caltrans, District 7**
Dianna Watson
- [ ] **Caltrans, District 8**
Dan Kopulsky
- [ ] **Caltrans, District 9**
Gayle Rosander
- [ ] **Caltrans, District 10**
Tom Dumas
- [ ] **Caltrans, District 11**
Jacob Armstrong
- [ ] **Caltrans, District 12**
Marlon Regisford

Cal EPA

Air Resources Board

- [ ] Airport/Energy Projects
Jim Lerner
- [x] Transportation Projects
Douglas Ito
- [ ] Industrial Projects
Mike Tollstrup
- [ ] **State Water Resources Control Board**
Regional Programs Unit
Division of Financial Assistance
- [ ] **State Water Resources Control Board**
Student Intern, 401 Water Quality Certification Unit
Division of Water Quality
- [ ] **State Water Resouces Control Board**
Phil Crader
Division of Water Rights
- [ ] **Dept. of Toxic Substances Control**
CEQA Tracking Center
- [ ] **Department of Pesticide Regulation**
CEQA Coordinator

Regional Water Quality Control Board (RWQCB)

- [ ] **RWQCB 1**
Cathleen Hudson
North Coast Region (1)
- [ ] **RWQCB 2**
Environmental Document Coordinator
San Francisco Bay Region (2)
- [ ] **RWQCB 3**
Central Coast Region (3)
- [x] **RWQCB 4**
Teresa Rodgers
Los Angeles Region (4)
- [ ] **RWQCB 5S**
Central Valley Region (5)
- [ ] **RWQCB 5F**
Central Valley Region (5)
Fresno Branch Office
- [ ] **RWQCB 5R**
Central Valley Region (5)
Redding Branch Office
- [ ] **RWQCB 6**
Lahontan Region (6)
- [ ] **RWQCB 6V**
Lahontan Region (6)
Victorville Branch Office
- [ ] **RWQCB 7**
Colorado River Basin Region (7)
- [ ] **RWQCB 8**
Santa Ana Region (8)
- [ ] **RWQCB 9**
San Diego Region (9)

- [ ] Other ____________
- [ ] ____________ Conservancy

Last Updated 2/29/2012

COUNTY SANITATION DISTRICTS
OF LOS ANGELES COUNTY

1955 Workman Mill Road, Whittier, CA 90601-1400
Mailing Address: P.O. Box 4998, Whittier, CA 90607-4998
Telephone: (562) 699-7411, FAX: (562) 699-5422
www.lacsd.org

GRACE ROBINSON CHAN
Chief Engineer and General Manager

May 30, 2012

Ref. File No: 2235313

PLANNING DIVISION
2012 JUN -4 AM 10: 04

Mr. Brad Johnson, Planning Manager
Planning Division
City of Pomona
505 South Garey Avenue
Pomona, CA 91766

Dear Mr. Johnson:

2011 General Plan Update

The County Sanitation Districts of Los Angeles County (Districts) received a Notice of Preparation of a Draft Environmental Impact Report for the subject project on May 7, 2012. The proposed development is located within the jurisdictional boundaries of District No. 21. We offer the following comments regarding sewerage service:

1. The Districts should review individual developments within the City of Pomona (City) in order to determine whether or not sufficient trunk sewer capacity exists to serve each project and if Districts' facilities will be affected by a project.

2. The Districts own, operate, and maintain only the large trunk sewers that form the backbone of the regional wastewater conveyance system. Local collector and/or lateral sewer lines are the responsibility of the jurisdiction in which they are located. As such, the Districts cannot comment on any deficiencies in the sewerage system in the City except to state that presently no deficiencies exist in Districts' facilities that serve the City.

3. The wastewater generated by the proposed project will be treated at the Pomona Water Reclamation Plant (WRP), which has a design capacity of 15 mgd and currently processes an average flow of 8.7 million gallons per day (mgd), or the San Jose Creek WRP located adjacent to the City of Industry, which has a design capacity of 100 mgd and currently processes an average flow of 75.1 mgd. Wastewater flows that exceed the capacity of the San Jose Creek WRP, and all biosolids, are diverted to and treated at the Joint Water Pollution Control Plant located in the City of Carson.

4. In order to estimate the volume of wastewater the project will generate, go to www.lacsd.org, Information Center, Will Serve Program/Buildover Procedures, Obtain Will Serve Letter, and click on the appropriate link on page 2 for a copy of the Districts' average wastewater generation factors.

5. The Districts are authorized by the California Health and Safety Code to charge a fee for the privilege of connecting (directly or indirectly) to the Districts' Sewerage System or increasing the strength or quantity of wastewater attributable to a particular parcel or operation already connected. This connection fee is a capital facilities fee that is imposed in an amount sufficient to construct an incremental expansion of the Sewerage System to accommodate the proposed project. Payment of a connection fee will be required before a permit to connect to the sewer is issued. For a copy of the Connection Fee Information Sheet, go to www.lacsd.org, Information Center, Will Serve Program/Buildover Procedures, Obtain Will Serve Letter, and click on the appropriate link on page 2. For more specific information regarding the connection fee application procedure and fees, please contact the Connection Fee Counter at extension 2727.

6. In order for the Districts to conform to the requirements of the Federal Clean Air Act (CAA), the design capacities of the Districts' wastewater treatment facilities are based on the regional growth forecast adopted by the Southern California Association of Governments (SCAG). Specific policies included in the development of the SCAG regional growth forecast are incorporated into clean air plans, which are prepared by the South Coast and Antelope Valley Air Quality Management Districts in order to improve air quality in the South Coast and Mojave Desert Air Basins as mandated by the CAA. All expansions of Districts' facilities must be sized and service phased in a manner that will be consistent with the SCAG regional growth forecast for the counties of Los Angeles, Orange, San Bernardino, Riverside, Ventura, and Imperial. The available capacity of the Districts' treatment facilities will, therefore, be limited to levels associated with the approved growth identified by SCAG. As such, this letter does not constitute a guarantee of wastewater service, but is to advise you that the Districts intend to provide this service up to the levels that are legally permitted and to inform you of the currently existing capacity and any proposed expansion of the Districts' facilities.

If you have any questions, please contact the undersigned at (562) 908-4288, extension 2717.

Very truly yours,

Grace Robinson Chan

Adriana Raza

Adriana Raza
Customer Service Specialist
Facilities Planning Department

AR: ar

State of California -The Natural Resources Agency
DEPARTMENT OF FISH AND GAME
South Coast Region
3883 Ruffin Road
San Diego, CA 92123
(858) 467-4201
http://www.dfg.ca.gov

EDMUND G. BROWN JR., Governor
CHARLTON H. BONHAM, Director

June 5, 2012

Mr. Brad Johnson
City of Pomona
505 South Garey Avenue
Pomona, CA 91769

Subject: Notice of Preparation for a Draft Environmental Impact Report for City of Pomona General Plan SCH # 2012051025, Los Angeles County

Dear Mr. Johnson:

The Department of Fish and Game (Department) has reviewed the Initial Study and Notice of Preparation for a Draft Environmental Impact Report (DEIR) for the Update to the Pomona General Plan and the proposed Pomona Corridor Specific Plan (project). The project will update planning elements within the City's General Plan and set a framework for private and public investment activities along designated routes within the City.

The California Wildlife Action Plan, a recent Department guidance document, identified the following stressors affecting wildlife and habitats within the project area: 1) growth and development; 2) water management conflicts and degradation of aquatic ecosystems; 3) invasive species; 4) altered fire regimes; and 5) recreational pressures. With these stressors in mind, the Department has previously worked with the City of Pomona in recommending conservation and protective measures for biological and botanical resources and looks forward to continuing this effort. Please let Department staff know if you would like a copy of the California Wildlife Action Plan to review.

The Department is California's Trustee Agency for fish and wildlife resources, holding these resources in trust for the People of the State pursuant to various provisions of the California Fish and Game Code. (Fish & G. Code, §§ 711.7, subd. (a), 1802.) The Department submits these comments in that capacity under the California Environmental Quality Act (CEQA). (See generally Pub. Resources Code, §§ 21070; 21080.4.) Given its related permitting authority under the California Endangered Species Act (CESA) and Fish and Game Code section 1600 *et seq.*, the Department also submits these comments likely as a Responsible Agency for the project under CEQA. (*Id.*, § 21069.)

To enable Department staff to adequately review and comment on the proposed project we recommend the following information, where applicable, be included in the DEIR:

1. A complete, recent assessment of flora and fauna within and adjacent to the project area, with particular emphasis upon identifying endangered, threatened, and locally unique species and sensitive habitats including:

    a. A thorough recent assessment of rare plants and rare natural communities, following the Department's Guidelines for Assessing Impacts to Rare Plants and Rare Natural Communities. (See Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Natural Communities at: http://www.dfg.ca.gov/habcon/plant/).

b. A complete, recent assessment of sensitive fish, wildlife, reptile, and amphibian species. Seasonal variations in use within the project area should also be addressed. Recent, focused, species-specific surveys, conducted at the appropriate time of year and time of day when the sensitive species are active or otherwise identifiable, are required.

c. Endangered, rare, and threatened species to address should include all those species which meet the related definition under the CEQA Guidelines. (See Cal. Code Regs., tit. 14, § 15380).

d. The Department's Biogeographic Data Branch in Sacramento should be contacted at (916) 322-2493 (www.dfg.ca.gov/biogeodata) to obtain current information on any previously reported sensitive species and habitats, including Significant Natural Areas identified under Chapter 12 of the Fish and Game Code. Also, any Significant Ecological Areas (SEAs) or Environmentally Sensitive Habitats (ESHs) or any areas that are considered sensitive by the local jurisdiction that are located in or adjacent to the project area must be addressed.

2. A thorough discussion of direct, indirect, and cumulative impacts expected to adversely affect biological resources, with specific measures to offset such impacts. This discussion should focus on maximizing avoidance, and minimizing impacts.

   a. CEQA Guidelines, Section 15125(a), direct that knowledge of the regional setting is critical to an assessment of environmental impacts and that special emphasis should be placed on resources that are rare or unique to the region.

   b. Project impacts including deposition of debris should also be analyzed relative to their effects on off-site habitats and populations. Specifically, this should include nearby public lands, open space, natural habitats, and riparian ecosystems. Impacts to and maintenance of wildlife corridor/movement areas, including access to undisturbed habitat in adjacent areas are of concern to the Department and should be fully evaluated and provided. The analysis should also include a discussion of the potential for impacts resulting from such effects as increased vehicle traffic, outdoor artificial lighting, noise and vibration and pest management.

   c. A cumulative effects analysis should be developed as described under CEQA Guidelines, Section 15130. General and specific plans, as well as past, present, and anticipated future projects, should be analyzed relative to their impacts on similar plant communities and wildlife habitats.

   d. Impacts to migratory wildlife affected by the project should be fully evaluated including proposals to remove/disturb native and ornamental landscaping and other nesting habitat for native birds. Impact evaluation may also include such elements as migratory butterfly roost sites and neo-tropical bird and waterfowl stop-over and staging sites. All migratory nongame native bird species are protected by international treaty under the Federal Migratory Bird Treaty Act (MBTA) of 1918 (50 C.F.R. Section 10.13). Sections 3503, 3503.5 and 3513 of the California Fish and Game Code prohibit take of birds and their active nests, including raptors and other migratory nongame birds as listed under the MBTA.

   e. Impacts from project activities (including but not limited to, staging and disturbances to native and non native vegetation, structures, and substrates) should occur outside of the avian breeding season which generally runs from March 1-August 31 (as early as January 1 for some raptors) to avoid take of birds or their eggs. If project activities cannot avoid the avian breeding season, nest surveys should be conducted and active nests should be avoided and provided with a minimum buffer as determined by a biological monitor (the Department generally recommends a minimum 300 foot nest avoidance buffer or 500 feet for all active raptor nests).

f. Proposed impacts to all habitats from City or County required Fuel Modification Zones (FMZ). Areas slated as mitigation for loss of habitat shall not occur within the FMZ.

3. A range of alternatives should be analyzed to ensure that alternatives to the proposed project are fully considered and evaluated. A range of alternatives which avoid or otherwise minimize impacts to sensitive biological resources including wetlands/riparian habitats, alluvial scrub, coastal sage scrub, should be included. Specific alternative locations should also be evaluated in areas with lower resource sensitivity where appropriate.

   a. Mitigation measures for project impacts to sensitive plants, animals, and habitats should emphasize evaluation and selection of alternatives which avoid or otherwise minimize project impacts. Compensation for unavoidable impacts through acquisition and protection of high quality habitat elsewhere should be addressed with off-site mitigation locations clearly identified.

   b. The Department considers Rare Natural Communities as threatened habitats having both regional and local significance. Thus, these communities should be fully avoided and otherwise protected from project-related impacts (Attachment).

   c. The Department generally does not support the use of relocation, salvage, and/or transplantation as mitigation for impacts to rare, threatened, or endangered species. Department studies have shown that these efforts are experimental in nature and largely unsuccessful.

4. An Incidental Take Permit (ITP) from the Department may be required if the project, project construction, or any project-related activity during the life of the project will result in "take" as defined by the Fish and Game Code of any species protected by CESA. (Fish & G. Code, §§86, 2080, 2081, subd. (b), (c).) Early consultation with Department regarding potential permitting obligations under CESA with respect to the project is encouraged. (Cal. Code Regs., tit. 14, § 783.2, subd. (b).). It is imperative with these potential permitting obligations that the draft environmental document prepared by the Lead Agency includes a thorough and robust analysis of the potentially significant impacts to endangered, rare, and threatened species, and their habitat, that may occur as a result of the proposed project. For any such potentially significant impacts the Lead Agency should also analyze and describe specific, potentially feasible mitigation measures to avoid or substantially lessen any such impacts as required by CEQA and, if an ITP is necessary, as required by the relevant permitting criteria prescribed by Fish and Game Code section 2081, subdivisions (b) and (c). The failure to include this analysis in an environmental document could preclude the Department from relying on the Lead Agency's analysis to issue an ITP without the Department first conducting its own, separate Lead Agency subsequent or supplemental analysis for the project. (See, e.g., Cal. Code Regs., tit. 14, § 15096, subd. (f).) For these reasons, the following information is requested:

a. Biological mitigation monitoring and reporting proposals should be of sufficient detail and resolution to satisfy the requirements for a CESA Permit.

b. A Department-approved Mitigation Agreement and Mitigation Plan are required for plants listed as rare under the Native Plant Protection Act.

5. The Department opposes the elimination of watercourses (including concrete channels, blue line streams and other watercourses not designated as blue line streams on USGS maps) and/or the channelization of natural and manmade drainages or conversion to subsurface drains. All wetlands and watercourses, whether intermittent, ephemeral, or perennial, must be retained and provided with substantial setbacks which preserve the riparian and aquatic habitat values and maintain their value to on-site and off-site wildlife populations. The Department recommends a minimum natural buffer of 100 feet from the outside edge of the riparian zone on each side of drainage.

   a. The Department also has regulatory authority with regard to activities occurring in streams and/or lakes that could adversely affect any fish or wildlife resource. For any activity that will divert or obstruct the natural flow, or change the bed, channel, or bank (which may include associated riparian resources) or a river or stream or use material from a streambed, the project applicant (or "entity") must provide written notification to the Department pursuant to Section 1602 of the Fish and Game Code. Based on this notification and other information, the Department then determines whether a Lake and Streambed Alteration (LSA) Agreement is required. The Department's issuance of an LSA Agreement is a project subject to CEQA. To facilitate issuance of a LSA Agreement, if necessary, the environmental document should fully identify the potential impacts to the lake, stream or riparian resources and provide adequate avoidance, mitigation, monitoring and reporting commitments for issuance of the LSA Agreement. Early consultation is recommended, since modification of the proposed project may be required to avoid or reduce impacts to fish and wildlife resources. Again, the failure to include this analysis in the project's environmental document could preclude the Department from relying on the Lead Agency's analysis to issue a LSA Agreement without the Department first conducting its own, separate Lead Agency subsequent or supplemental analysis for the project.

Thank you for this opportunity to provide comments. Please contact Mr. Scott Harris, Environmental Scientist at (626) 797-3170 if you should have any questions and for further coordination on the proposed project.

Sincerely,

Terri Dickerson

Terri Dickerson
Senior Environmental Scientist
South Coast Region

Attachment

cc: Ms. Leslie MacNair, Laguna Hills
Ms. Kelly Schmoker, Pasadena
Mr. Scott Harris, Pasadena
State Clearinghouse, Sacramento

Sensitivity of Top Priority Rare Natural Communities in Southern California

Sensitivity rankings are determined by the Department of Fish and Game, California Natural Diversity Data Base and based on either number of known occurrences (locations) and/or amount of habitat remaining (acreage). The three rankings used for these top priority rare natural communities are as follows:

S1.# Fewer than 6 known locations and/or on fewer than 2,000 acres of habitat remaining.

S2.# Occurs in 6-20 known locations and/or 2,000-10,000 acres of habitat remaining.

S3.# Occurs in 21-100-known locations and/or 10,000-50,000 acres of habitat remaining.

The number to the right of the decimal point after the ranking refers to the degree of threat posed to that natural community regardless of the ranking. For example:

S1.1 = very threatened
S2.2 = threatened
S3.3 = no current threats known

Sensitivity Rankings (February 1992)

Rank	Community Name
S1.1	Mojave Riparian Forest
	Sonoran Cottonwood Willow Riparian
	Mesquite Bosque
	Elephant Tree Woodland
	Crucifixion Thorn Woodland
	Allthorn Woodland
	Arizonan Woodland
	Southern California Walnut Forest
	Mainland Cherry Forest
	Southern Bishop Pine Forest
	Torrey Pine Forest
	Desert Mountain White Fir Forest
	Southern Dune Scrub
	Southern Coastal Bluff Scrub
	Maritime Succulent Scrub
	Riversidean Alluvial Fan Sage Scrub
	Southern Maritime Chaparral
	Valley Needlegrass Grassland
	Great Basin Grassland
	Mojave Desert Grassland
	Pebble Plains
	Southern Sedge Bog
	Cismontane Alkali Marsh

S1.2	Southern Foredunes Mono Pumice Flat Southern Interior Basalt Flow Vernal Pool
S2.1	Venturan Coastal Sage Scrub Diegan Coastal Sage Scrub Riversidean Upland Coastal Sage Scrub Riversidean Desert Sage Scrub Sagebrush Steppe Desert Sink Scrub Mafic Southern Mixed Chaparral San Diego Mesa Hardpan Vernal Pool San Diego Mesa Claypan Vernal Pool Alkali Meadow Southern Coastal Salt Marsh Coastal Brackish Marsh Transmontane Alkali Marsh Coastal and Valley Freshwater Marsh Southern Arroyo Willow Riparian Forest Southern Willow Scrub Modoc-Great Basin Cottonwood Willow Riparian Modoc-Great Basin Riparian Scrub Mojave Desert Wash Scrub Engelmann Oak Woodland Open Engelmann Oak Woodland Closed Engelmann Oak Woodland Island Oak Woodland California Walnut Woodland Island Ironwood Forest Island Cherry Forest Southern Interior Cypress Forest Bigcone Spruce-Canyon Oak Forest
S2.2	Active Coastal Dunes Active Desert Dunes Stabilized and Partially Stabilized Desert Dunes Stabilized and Partially Stabilized Desert Sandfield Mojave Mixed Steppe Transmontane Freshwater Marsh Coulter Pine Forest Southern California Fellfield White Mountains Fellfield
S2.3	Bristlecone Pine Forest Limber Pine Forest

PLANNING DIVISION
2012 MAY 29 PM 5:01

GABRIELEÑO BAND OF MISSION INDIANS

Historically known as The San Gabriel Band of Mission Indians
recognized by the State of California as the aboriginal tribe of the Los Angeles basin

Brad Johnson, Planning Manager
City of Pomona
505 South Garey Ave
Pomona, CA 91766

May 20, 2012

Dear Mr. Johnson,

Thank you for your correspondence dated May 2, 2012 advising me of the EIR for the proposed update of the Pomona General Plan and the Pomona Corridors Specific Plan. We, the Gabrieleno Indians, once occupied the now greater Los Angeles area with many villages located in and around the Pomona area. One such village was named Toibinga. We consider this area to be potentially full of cultural resources that have yet to be found. We are requesting to protect our potential resources by having one of our experienced & certified Native American monitors to be on site during all ground disturbances. We would like to request participating in the consultation process.

In all cases, when or if the Native American Heritage Commission states there are "no records of sacred sites" in the subject area, they always refer the contractors back to the Native American Tribes whose tribal territory the project area is in. This is due to the fact that the NAHC is only aware of general information on each California NA Tribe they are not the "experts" on our Tribe. Our Elder Committee & Tribal Historians are the experts and are the reason why the NAHC will always refer contractors to the local tribes.

We are requesting that this response be included in your Final EIR for this project. Please contact our office regarding this project to coordinate a Native American monitor to be present during ground disturbing construction.

Sincerely,

Andy Salas, Chairman
Gabrieleno Band of Mission Indians

P.O. Box 393 • Covina, California 91723 • 626.926.4131 • www.gabrielenoindians.org

COUNTY OF LOS ANGELES
FIRE DEPARTMENT
1320 NORTH EASTERN AVENUE
LOS ANGELES, CALIFORNIA 90063-3294
(323) 881-2401

DARYL L. OSBY
FIRE CHIEF
FORESTER & FIRE WARDEN

PLANNING DIVISION
2012 JUN 25 AM 11: 44

June 4, 2012

Brad Johnson, Planning Manager
City of Pomona
Planning Division
505 South Garey Avenue
Pomona, CA 91766

Dear Mr. Johnson:

NOTICE OF PREPARATION OF A DRAFT ENVIRONMENTAL IMPACT REPORT, 2011 GENERAL PLAN UPDATE AND POMONA CORRIDORS SPECIFIC PLAN, FIRST COMPREHENSIVE UPDATE OF THE CITY'S GENERAL PLAN SINCE 1976, IT INCLUDES SEVEN COMPONENTS, CITY OF POMONA (FFER #201200070)

The Notice of Preparation has been reviewed by the Planning Division, Land Development Unit, Forestry Division and Health Hazardous Materials Division of the County of Los Angeles Fire Department. The following are their comments:

PLANNING DIVISION:

1. We have no comments at this time.

LAND DEVELOPMENT UNIT:

1. This project does not propose construction of structures or any other improvements at this time. Therefore, until actual construction is proposed the project will not have a significant impact to the Fire Department, Land Development Unit.

2. The County of Los Angeles Fire Department, Land Development Unit appreciates the opportunity to comment on this project.

3. The statutory responsibilities of the County of Los Angeles Fire Department, Land Development Unit, are the review of and comment on, all projects within the unincorporated areas of the County of Los Angeles. Our emphasis is on the availability of sufficient water

supplies for firefighting operations and local/regional access issues. However, we review all projects for issues that may have a significant impact on the County of Los Angeles Fire Department. We are responsible for the review of all projects within Contract Cities (cities that contract with the County of Los Angeles Fire Department for fire protection services). We are responsible for all County facilities, located within non-contract cities.

The County of Los Angeles Fire Department, Land Development Unit may also comment on conditions that may be imposed on a project by the Fire Prevention Division, which may create a potentially significant impact to the environment.

4. Should any questions arise regarding subdivision, water systems, or access, please contact the County of Los Angeles Fire Department, Land Development Unit Inspector, Claudia Soiza, at (323) 890-4243.

FORESTRY DIVISION – OTHER ENVIRONMENTAL CONCERNS:

1. The statutory responsibilities of the County of Los Angeles Fire Department, Forestry Division include erosion control, watershed management, rare and endangered species, vegetation, fuel modification for Very High Fire Hazard Severity Zones or Fire Zone 4, archeological and cultural resources and the County Oak Tree Ordinance. Potential impacts in these areas should be addressed in the Draft Environmental Impact Report.

HEALTH HAZARDOUS MATERIALS DIVISION:

1. The Health Hazardous Materials Division has no objection to the proposed project.

If you have any additional questions, please contact this office at (323) 890-4330.

Very truly yours,

Frank Vidales

FRANK VIDALES, ACTING CHIEF, FORESTRY DIVISION
PREVENTION SERVICES BUREAU

FV:ij

AMAN FAMILY, LLC
614 E. Edna Place
Covina, CA 91723

May 14, 2012

Mr. Brad Johnson
City of Pomona
Planning Division
505 S. Garey Avenue
Pomona, CA 91766

Re: General Plan Update
Notice of Error

Dear Mr. Johnson,

This is to acknowledge receipt of the City General Plan Update and Pomona Corridors Specific Plan. This is to inform you of an error and protest of information provided in the information distributed and contained in the General Plan Update.

I am the Owner/General Manager of a 120 acre property located just East of the 57 Freeway, North of Mission Avenue, South of the railroad tracks and West of Humane Way. The area is known as Elephant Hill. The current zone on my property according to zoning maps is "Open Space" and "PRD". However, the maps provided in your notice indicate 100% Open Space.

Please be informed that the map is incorrect. Therefore, the various studies emanating from the map, such as traffic, aesthetics, noise, etc. will not fully represent the true impacts. I believe the study should be based on the currently approved land use plan.

I also believe that the current General Plan Map which shows my property as "100% Open Space" is in error. The 1989 Land Use Element Plan adopted by the City indicates that my property is Open Space and PRD. I am especially concerned that it implies an inverse condemnation of my property and will damage my ability to realize any potential use by creating a "no development" scenario. This also deceives the residents of Pomona and the public at large.

Sincerely,

Steve Aman
Managing Partner

MAYANS
DEVELOPMENT
22343 La Palma Ave. Suite # 132
Yorba Linda, California 92887
714-692-1900 office
714-692-1933 facsimile

PLANNING DIVISION
2012 JUN -7 AM 8:10

June 6, 2012

Brad Johnson
Planning Manager
City of Pomona - Planning Division
505 South Garey Avenue
Pomona, California 91766

RE: General Plan Designation for Corner of Mission Boulevard and Dudley Avenue including APN # 8349-009-055

Dear Mr. Johnson:

I am writing to express Mayans Development's strong support of the updated General Plan and Corridor Specific Plan. We are stakeholders in the City that own multiple properties which will be affected by the proposed changes.

We are requesting the following changes for the corner of Mission Boulevard and Dudley Avenue including parcel # 8349-009-055;

1. Change the General Plan designation of Neighborhood Edge to Urban Neighborhood due to the proximity to Mission Boulevard within the Corridor Specific Plan.
2. Incorporate this area into the T4-A transect zone from the T4-B zone

Please keep me posted and informed on the progress and status of the General Plan and Specific Plans as they move forward. I look forward to working with you on our future projects and assisting in fulfilling the City's needs and this positive change. If you have any questions, please feel free to contact us.

Sincerely,

Ismael Mayans
President

OMNITRANS

PLANNING DIVISION
2012 JUN -5 PM 3:53

May 31, 2012

Brad Johnson, Planning Manager
City of Pomona
505 South Garey Avenue
Pomona, CA 91766

Subject: Comments regarding Notice of Preparation (NOP) of a Draft Environmental Impact Report for the General Plan Update/Pomona Corridors Specific Plan

Dear Mr. Johnson,

Thank you for providing Omnitrans, the public transportation provider for the San Bernardino Valley, the opportunity to offer the following comments with respect to the City of Pomona's General Plan Update (GPU). Based on Pomona's goals to preserve important connectors and refine existing corridors, it appears that the changes proposed in the General Plan Update/Pomona Corridors Specific Plan will help to support our goal as an agency to continue to provide high-quality transit service to your city.

As illustrated in the 2011 General Plan Update map in the Notice of Preparation, Holt Avenue in Pomona is an important corridor for potential transit oriented development. Omnitrans' Route 61, the highest-ridership route in the Omnitrans system, currently operates on Holt Avenue in Pomona. This corridor was identified in Omnitrans' System-wide Transit Corridor Plan for the San Bernardino Valley in 2009 as a corridor with high potential for bus rapid transit, will present opportunities for economic development, transit oriented development, increased transit ridership, and travel time savings along the corridor.

Omnitrans was awarded an FTA grant to conduct an Alternatives Analysis study for the 20.4 mile Holt Boulevard corridor, which will be conducted in 2013 and 2014 as a collaborative effort with the cities of Fontana, Montclair, Ontario, Pomona, and Rancho Cucamonga, as well as San Bernardino County, SANBAG, SCAG, and the Ontario International Airport.

Additionally, we encourage land use policies that support connectivity of various modes of transportation, including bus, walking, cycling and per your city's future transit goals, bus rapid transit (BRT) and Metrolink. Following is some sample general plan text that may be considered, if not already included in the general plan update text:

1.1: Continue to consult with regional transit operators to maintain and improve the coverage and frequency of transit service in the City.

1.2: Consult with Omnitrans to establish and maintain transit hubs at key locations throughout city, both existing and planned.

1.3: In addition to requiring private development to provide transit amenities, consult with regional transit operators (Omnitrans & Foothill Transit) to provide attractive and convenient bus stops, including shade/weather protection, seats, transit information, and bus shelters as appropriate.

1.4: Continue to develop and maintain a citywide bicycle network of off-street bike paths, on-street bike lanes, and bike streets to provide connections between neighborhoods, schools, parks, civic center/facilities, recreational facilities, and major commercial centers.

1.5: Continue to require that the siting and architectural design of new development, infill or redevelopment projects promotes safety, pedestrian-friendly design, and access to transit facilities.

1.6: Enhance pedestrian and bicycle access to local and regional transit, including facilitating connections to transit.

1.7: Continue to design and operate arterials and intersections for the safe operation of all modes of transportation, including transit, bicyclists, and pedestrians.

1.8: Continue to require that new development participates in the cost of transportation mitigation and improvements necessitated by new development, including non-automobile solutions.

1.9: Require that new and substantially renovated office, retail, industrial, and multi-family developments implement transit amenities, including bus turnouts, transit shelters, and other streetscape elements, as appropriate.

1.10: Require the future development of community-wide serving facilities to be sited in transit-ready areas that can be served and made accessible by public transit. Conversely, plan (and coordinate with other transit agencies to plan) future transit routes to serve existing community facilities.

1.11: Transit-Oriented Development. The city may want to provide additional development-related incentives to those inherent in the Land Use Plan for projects that promote transit use.

Sources: City of Rancho Cucamonga- General Plan
City of Ontario-General Plan

Omnitrans always looks forward to assisting our member cities in providing their residents with active transportation options. We look forward to working with Pomona to help accomplish your City's goals for mobility and quality of life. If you would like to meet with us or would like any additional information, feel free to contact me at (909) 379-7256 or Anna.Rahtz@Omnitrans.org.

Respectfully,

Anna Rahtz

Anna Rahtz
Planning Projects Manager

AR:ns

South Coast
Air Quality Management District
21865 Copley Drive, Diamond Bar, CA 91765-4182
(909) 396-2000 • www.aqmd.gov

May 30, 2012

PLANNING DIVISION
2012 JUN -5 PM 3:53

Brad Johnson, Planning Manager
City of Pomona
Planning Division
505 South Garey Avenue
Pomona, CA 91766

Notice of Preparation of a CEQA Document for the
<u>City of Pomona, 2011 General Plan Update</u>

The South Coast Air Quality Management District (SCAQMD) appreciates the opportunity to comment on the above-mentioned document. The SCAQMD's comments are recommendations regarding the analysis of potential air quality impacts from the proposed project that should be included in the draft CEQA document. Please send the SCAQMD a copy of the Draft EIR upon its completion. Note that copies of the Draft EIR that are submitted to the State Clearinghouse are not forwarded to the SCAQMD. Please forward a copy of the Draft EIR directly to SCAQMD at the address in our letterhead. **In addition, please send with the draft EIR all appendices or technical documents related to the air quality and greenhouse gas analyses and electronic versions of all air quality modeling and health risk assessment files. These include original emission calculation spreadsheets and modeling files (<u>not</u> Adobe PDF files). Without all files and supporting air quality documentation, the SCAQMD will be unable to complete its review of the air quality analysis in a timely manner. Any delays in providing all supporting air quality documentation <u>will require</u> additional time for review beyond the end of the comment period.**

<u>Air Quality Analysis</u>
The SCAQMD adopted its California Environmental Quality Act (CEQA) Air Quality Handbook in 1993 to assist other public agencies with the preparation of air quality analyses. The SCAQMD recommends that the Lead Agency use this Handbook as guidance when preparing its air quality analysis. Copies of the Handbook are available from the SCAQMD's Subscription Services Department by calling (909) 396-3720. The lead agency may wish to consider using land use emissions estimating software such as the recently released CalEEMod. This model is available on the SCAQMD Website at: http://www.aqmd.gov/ceqa/models.html.

The Lead Agency should identify any potential adverse air quality impacts that could occur from all phases of the project and all air pollutant sources related to the project. Air quality impacts from both construction (including demolition, if any) and operations should be calculated. Construction-related air quality impacts typically include, but are not limited to, emissions from the use of heavy-duty equipment from grading, earth-loading/unloading, paving, architectural coatings, off-road mobile sources (e.g., heavy-duty construction equipment) and on-road mobile sources (e.g., construction worker vehicle trips, material transport trips). Operation-related air quality impacts may include, but are not limited to, emissions from stationary sources (e.g., boilers), area sources (e.g., solvents and coatings), and vehicular trips (e.g., on- and off-road tailpipe emissions and entrained dust). Air quality impacts from indirect sources, that is, sources that generate or attract vehicular trips should be included in the analysis.

The SCAQMD has developed a methodology for calculating PM2.5 emissions from construction and operational activities and processes. In connection with developing PM2.5 calculation methodologies, the SCAQMD has also developed both regional and localized significance thresholds. The SCAQMD requests that the lead agency quantify PM2.5 emissions and compare the results to the recommended PM2.5 significance thresholds. Guidance for calculating PM2.5 emissions and PM2.5 significance thresholds can be found at the following internet address: http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html.

In addition to analyzing regional air quality impacts the SCAQMD recommends calculating localized air quality impacts and comparing the results to localized significance thresholds (LSTs). LST's can be used in addition to the recommended regional significance thresholds as a second indication of air quality impacts when preparing a CEQA document. Therefore, when preparing the air quality analysis for the proposed project, it is recommended that the lead agency perform a localized significance analysis by either using the LSTs developed by the SCAQMD or performing dispersion modeling as necessary. Guidance for performing a localized air quality analysis can be found at http://www.aqmd.gov/ceqa/handbook/LST/LST.html.

In the event that the proposed project generates or attracts vehicular trips, especially heavy-duty diesel-fueled vehicles, it is recommended that the lead agency perform a mobile source health risk assessment. Guidance for performing a mobile source health risk assessment ("Health Risk Assessment Guidance for Analyzing Cancer Risk from Mobile Source Diesel Idling Emissions for CEQA Air Quality Analysis") can be found on the SCAQMD's CEQA web pages at the following internet address: http://www.aqmd.gov/ceqa/handbook/mobile_toxic/mobile_toxic.html. An analysis of all toxic air contaminant impacts due to the decommissioning or use of equipment potentially generating such air pollutants should also be included.

Mitigation Measures

In the event that the project generates significant adverse air quality impacts, CEQA requires that all feasible mitigation measures that go beyond what is required by law be utilized during project construction and operation to minimize or eliminate significant adverse air quality impacts. To assist the Lead Agency with identifying possible mitigation measures for the project, please refer to Chapter 11 of the SCAQMD CEQA Air Quality Handbook for sample air quality mitigation measures. Additional mitigation measures can be found on the SCAQMD's CEQA web pages at the following internet address: www.aqmd.gov/ceqa/handbook/mitigation/MM_intro.html Additionally, SCAQMD's Rule 403 – Fugitive Dust, and the Implementation Handbook contain numerous measures for controlling construction-related emissions that should be considered for use as CEQA mitigation if not otherwise required. Other measures to reduce air quality impacts from land use projects can be found in the SCAQMD's Guidance Document for Addressing Air Quality Issues in General Plans and Local Planning. This document can be found at the following internet address: http://www.aqmd.gov/prdas/aqguide/aqguide.html. In addition, guidance on siting incompatible land uses can be found in the California Air Resources Board's Air Quality and Land Use Handbook: A Community Perspective, which can be found at the following internet address: http://www.arb.ca.gov/ch/handbook.pdf. CARB's Land Use Handbook is a general reference guide for evaluating and reducing air pollution impacts associated with new projects that go through the land use decision-making process. Pursuant to state CEQA Guidelines §15126.4 (a)(1)(D), any impacts resulting from mitigation measures must also be discussed.

Data Sources

SCAQMD rules and relevant air quality reports and data are available by calling the SCAQMD's Public Information Center at (909) 396-2039. Much of the information available through the Public Information Center is also available via the SCAQMD's World Wide Web Homepage (http://www.aqmd.gov).

The SCAQMD staff is available to work with the Lead Agency to ensure that project-related emissions are accurately identified, categorized, and evaluated. If you have any questions regarding this letter, please call Ian MacMillan, Program Supervisor, CEQA Section, at (909) 396-3244.

Sincerely,

Ian V. MacMillan

Ian MacMillan
Program Supervisor, CEQA Inter-Governmental Review
Planning, Rule Development & Area Sources

IM
LAC110325-01
Control Number

Appendix B Air Quality Calculation Sheets

PomonaGP.dat

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION
PAGE 1

JOB: City of Pomona GP - Pomona Blvd & West T
RUN: Hour 1 (WORST CASE ANGLE)
POLLUTANT:

I. SITE VARIABLES

U= 0.5 M/S Z0= 400. CM ALT= 210.3 (M)
BRG= WORST CASE VD= 0.0 CM/S
CLAS= 7 (G) VS= 0.0 CM/S
MIXH= 1000. M AMB= 3.0 PPM
SIGTH= 5. DEGREES TEMP= 20.0 DEGREE (C)

II. LINK VARIABLES

LINK DESCRIPTION	X1	Y1	X2	Y2	TYPE	VPH	EF (G/MI)	H (FT)	W (FT)
A. Pomona Blvd	792	467	234	0	AG	1150	2.0	0.0	61.0
B. Pomona Blvd	873	518	1350	954	AG	890	2.0	0.0	71.0
C. Temple Ave W	792	518	0	893	AG	2360	2.0	0.0	102.0
D. Temple Ave E	873	467	1147	355	AG	2110	2.0	0.0	102.0
E. Temple Ave E	1147	355	1624	244	AG	2110	2.0	0.0	102.0

(X1, Y1, X2, Y2 = LINK COORDINATES (FT))

III. RECEPTOR LOCATIONS

RECEPTOR	X	Y	Z
1. S corner	832	447	0.0
2. N corner	832	538	0.0
3. W corner	741	487	0.0
4. E corner	924	497	0.0

(COORDINATES (FT))

IV. MODEL RESULTS (WORST CASE WIND ANGLE)

RECEPTOR	BRG (DEG)	PRED CONC (PPM)	A	B	C	D	E
1. S corner	300.	3.5	0.0	0.0	0.5	0.0	0.0
2. N corner	292.	3.6	0.0	0.0	0.6	0.0	0.0
3. W corner	301.	3.6	0.0	0.0	0.6	0.0	0.0
4. E corner	292.	3.5	0.0	0.1	0.4	0.1	0.0

(A–E = CONC/LINK (PPM))

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Appendix C Historic Resources Technical Report

Architectural Resources Group, Inc.
Architects, Planners & Conservators

General Plan Update and Pomona Corridors Specific Plan

Pomona, California

Historic Resources Technical Report

July 18, 2012

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1. INTRODUCTION

In response to a request from Rincon Consultants, Architectural Resources Group (ARG) has evaluated the potential impacts to historical resources pertaining to two related planning efforts in Pomona, California. The two plans – an update to the General Plan (Pomona Tomorrow) and the Pomona Corridors Specific Plan – are currently undergoing evaluation through a coordinated Environmental Impact Report (EIR) process.

Overviews of both the General Plan and Corridors Specific Plan are provided below. The components of the plans that relate specifically to the treatment of historical resources are described and discussed in detail in Sections 7 and 8 below.

General Plan Update (Pomona Tomorrow)
The proposed General Plan is the first comprehensive update of the City's General Plan since 1976 and establishes the community's vision for the future development of the City. The General Plan provides comprehensive policies for the entire City related to land use, housing, circulation, infrastructure, public services, resource conservation and public safety.

For most of the City, the General Plan preserves the existing pattern of uses and establishes policies for protection and long-term maintenance of established neighborhoods. Generally, new development in accordance with the updated General Plan would consist of re-use of properties, conversion of uses in response to market demand (e.g., office and industrial to residential), and more intense use of land in defined areas. Overall, the General Plan emphasizes a renewed Downtown and redefined corridors, proposes focus areas and activity centers to help shape and distribute new development, promotes protecting the character of existing residential neighborhoods, and outlines the future role and form of Pomona's public realm.

The General Plan divides the City's land uses into the following categories:

- Activity Center
- Transit Oriented District: Core or Neighborhood
- Urban Neighborhood
- Residential Neighborhood
- Neighborhood Edge
- Workplace District
- Workplace District Edge
- Open Space
- Special Campus: Civic Center
- Special Campus: Lanterman Center
- Special Campus: Cal Poly Pomona
- Special Campus: Fairplex

The General Plan addresses land use density/intensity standards via ten transect zones, each of which includes a range of development density/intensity, as well as maximum permitted building heights and a mix of allowable uses.

The General Plan identifies those areas of the City with the potential for the most change under the objectives and goals espoused in the General Plan. These areas are classified as having potential for change in the short-term (5 years), medium-term (10 years) and long-term (20 years). These areas are primarily focused around the main roadway corridors of the City and the Downtown. An exception is the Fairplex area, which is expected to have a high percentage of properties with potential for change in the medium term.

Specifically, the City's estimated growth in population, retail uses and office uses is expected to be concentrated within 13 focus areas, 9 of which sit within the Corridors Specific Plan area:

Focus Areas within Corridors Specific Plan Area:

- Foothill Boulevard
- North Metrolink TOD
- North Garey Avenue (I-10 to North Metrolink Station)
- North Garey Avenue (Downtown to I-10)
- West Holt Avenue
- West Holt Avenue/State Route 71 TOD
- East Holt Avenue
- Mission Boulevard and South Garey Boulevard
- South Garey Avenue and Philadelphia Street

Other Focus Areas

- Fairplex
- Pomona Valley Hospital Medical Center (PVMHC)
- Downtown
- Mission Boulevard/State Route 71

Pomona Corridors Specific Plan

The Corridors Specific Plan is intended to orchestrate private and public investment activities along the Garey Avenue, Holt Avenue, Mission Boulevard, and Foothill Boulevard corridors, and to support and promote the type of investment that will enhance the beauty and vitality of these primary commercial corridors. The updated Pomona General Plan identifies these corridors as Focus Areas that require specific planning and regulatory direction to guide projects to ensure that the General Plan vision is achieved. As such, the Corridors Specific Plan implements the vision, goals and policies established in the General Plan for these corridors.

The vision of the Specific Plan is to transform the identified corridors from undifferentiated commercial strips into corridors characterized by periodic clusters of shops, activity, mix, and intensity (centers) interspersed with longer linear portions distinguished by cohesive building types, frontage landscaping, and emerging market focus (segments). Within the Specific Plan, the corridors are divided into the following types of centers and segments:

- <u>Downtown Core</u> and <u>Transit-Oriented Districts</u> will offer commercial goods and services for the community, the entire City and the surrounding region. They will be places of focal activity that are served by comfortable walking streets and transit service, and are set amidst a mix of homes, offices, hotel rooms, and active ground level shopping and entertainment venues.

- Neighborhood Centers will be compact clusters of more local, convenience-oriented retail and services that cater to the needs of neighborhoods within a short walk, drive, or bike ride.

- Downtown Gateway, Workplace Gateway, Mixed-Use, and Midtown Segments will focus on a synergistic and compatible mix of workplace, commercial, and medium-density residential uses that orient front doors and public façades onto the corridor. These segments will serve as buffers for the adjacent neighborhoods and will balance automobile and pedestrian access.

- Neighborhood Segments will present a lower-profile mix of corridor uses together with stronger front yard landscaping, putting more emphasis on buffering the edges of the adjacent neighborhoods.

The Specific Plan lays out proposed planning approaches and specific revitalization strategies for each of these center/segment types.

2. METHODOLOGY

To prepare the following historic resources technical report, ARG reviewed existing documentation relevant to the planning area and conducted a reconnaissance survey of potential historic resources in the Corridors Specific Plan area.

Review of Existing Documentation
In addition to examining the General Plan Update and Pomona Corridors Specific Plan, ARG reviewed several background documents that address the treatment of historical resources in Pomona. These include historical survey summary reports (see Section 4.2 below) as well as several background documents prepared in conjunction with the previous (and unsuccessful) effort to finalize a General Plan Update in 2007.

In particular, ARG used the Cultural Resources chapter of the March 2007 Draft Environmental Impact Report (DEIR) completed by EIP Associates for the prior General Plan Update as a starting point for this Historical Resources Technical Report. Specifically, ARG reviewed the content of that chapter, incorporated it as appropriate, and updated it to reflect: (1) any properties designated at the local, state or national levels since the prior report; and (2) any substantive differences between the current General Plan Update and the previously evaluated General Plan Update. As part of this process, ARG contacted the South Coast Central Information Center (SCCIC) to obtain an updated Historic Property Data File for the City of Pomona.

Reconnaissance Historic Resources Survey
To evaluate potential impacts related to the Pomona Corridors Specific Plan, ARG conducted a reconnaissance survey of properties within the plan area that are 50 years of age or older. Prior to going out into the field, ARG created GIS maps that identified all buildings within the plan area that exceed the 50-year age threshold. The reconnaissance survey was conducted June 27-28, 2012. While in the field, ARG identified and photographed properties that meet the age requirement, preliminarily appear to satisfy state (California Register of Historical Resources) or local (City of Pomona) designation criteria, and retain sufficient integrity to convey their significance. Previously designated properties were not surveyed.

Based on the survey results, ARG compiled a list of resources (Appendix A) within the Specific Plan area that preliminarily appear to be eligible for the state and/or local designation criteria, per the requirements of CEQA. Each property in the list is identified by parcel number, address and date of construction, as well as a preliminary California State Historical Resource Status Code (CHRSC).

3. REGULATORY FRAMEWORK: FEDERAL, STATE AND LOCAL DESIGNATION PROGRAMS

The regulatory background provided below offers an overview of federal, state and local criteria used to assess historic significance.

3.1 National Register of Historic Places

The National Register of Historic Places (NRHP) is the nation's master inventory of known historic resources and includes listings of buildings, structures, sites, objects and districts that possess historic, architectural, engineering, archaeological or cultural significance at the national, state or local level. As described in National Register Bulletin Number 15, *How to Apply the National Register Criteria for Evaluation*, a property must have both historical significance and integrity to be eligible for listing in the NRHP.

To be significant, a property must be "associated with an important historic context."[1] The National Register identifies four possible context types, of which at least one must be applicable to the property at the national, state, or local level. As listed under Section 8, "Statement of Significance," of the NRHP Registration Form, these are:

A. Property is associated with events that have made a significant contribution to the broad patterns of our history.

B. Property is associated with the lives of persons significant in our past.

C. Property embodies the distinctive characteristics of a type, period, or method of construction or represents the work of a master, or possesses high artistic values, or represents a significant and distinguishable entity whose components lack individual distinction.

D. Property has yielded, or is likely to yield, information important to prehistory or history.[2]

Second, for a property to qualify under the National Register's Criteria for Evaluation, it must also retain "historic integrity of those features necessary to convey its significance."[3] While a property's significance relates to its role within a specific historic context, its integrity refers to "a property's physical features and how they relate to its significance."[4] To determine if a property retains the physical characteristics corresponding to its historic context, the National Register has identified seven aspects of integrity:

Location is the place where the historic property was constructed or the place where the historic event occurred.

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[1] National Park Service, National Register Bulletin 15, 3.
[2] National Park Service, National Register Bulletin 16A, 75
[3] National Park Service, National Register Bulletin 15, 3.
[4] Ibid., 44.

Setting is the physical environment of a historic property.

Design is the combination of elements that create the form, plan, space, structure, and style of a property.

Materials are the physical elements that were combined or deposited during a particular period of time and in a particular pattern or configuration to form a historic property.

Workmanship is the physical evidence of the crafts of a particular culture or people during any given period in history or prehistory.

Feeling is a property's expression of the aesthetic or historic sense of a particular period of time.

Association is the direct link between an important historic event or person and a historic property.[5]

Since integrity is based on a property's significance within a specific historic context, an evaluation of a property's integrity can only occur after historic significance has been established.[6]

3.2 California Register of Historical Resources

The California Register of Historical Resources (CRHR) is the authoritative guide to the State's significant historical and archeological resources. It serves to identify, evaluate, register and protect California's historical resources. The CRHR program encourages public recognition and protection of resources of architectural, historical, archeological and cultural significance, identifies historical resources for state and local planning purposes, determines eligibility for historic preservation grant funding and affords certain protections under the California Environmental Quality Act. All resources listed on or formally determined eligible for the NRHP are automatically listed on the CRHR. In addition, properties designated under municipal or county ordinances are eligible for listing in the CRHR.

The California Register criteria are modeled on the National Register criteria discussed above. An historical resource must be significant at the local, state, or national level under one or more of the following criteria:

1. It is associated with events or patterns of events that have made a significant contribution to the broad patterns of local or regional history, or the cultural heritage of California or the United States.

2. It is associated with the lives of persons important to local, California, or national history.

3. It embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of a master, or possesses high artistic values.

4. It has yielded, or has the potential to yield, information important to the prehistory or history of the local area, state or the nation.[7]

[5] Ibid., 44-45.
[6] Ibid., 45.
[7] California Office of Historic Preservation, Technical Assistance Series 6, 1.

Like the NRHP, evaluation for eligibility to the California Register requires an establishment of historic significance before integrity is considered. California's integrity threshold is slightly lower than the federal level. As a result, some resources that are historically significant but do not meet NRHP integrity standards may be eligible for listing on the California Register.[8]

California's list of special considerations is shorter and more flexible than the NRHP. It includes some allowances for moved buildings, structures, or objects, as well as lower requirements for proving the significance of resources that are less than 50 years old and a more elaborate discussion of the eligibility of reconstructed buildings.

In addition to separate evaluations for eligibility to the California Register, the State will automatically list resources if they are listed or determined eligible for the NRHP through a complete evaluation process.[9]

The California Historic Resource Status Codes are a series of ratings created by the California Office of Historic Preservation (SHPO) to quickly and easily identify the historic status of resources listed in the state's historic properties database. These codes were revised in August 2003 to better reflect the many historic status options available to evaluators. The following are the seven major status code headings:

1. Properties listed in the National Register or the California Register.

2. Properties determined eligible for listing in the National Register or the California Register.

3. Appears eligible for National Register or California Register through Survey Evaluation.

4. Appears eligible for National Register or California Register through other evaluation.

5. Properties recognized as historically significant by local government.

6. Not eligible for listing or designation.

7. Not evaluated for National Register or California Register or needs revaluation.

3.3 Pomona Historic Preservation Ordinance

Pomona's Historic Preservation Ordinance (Section 5809-13 of the Zoning Ordinance) established the official city landmarks program and the legal basis for the designation and treatment of historic properties. A Historic Preservation Commission was established in 1995 as an advisory board to the City Council. The Commission was established to lead the implementation, enforcement, and education of the Preservation Ordinance.

The City was designated a Certified Local Government (CLG) on November 7, 2003. The Certified Local Government program establishes a partnership between local governments, the state historic preservation program, and the national historic preservation program through activities that strengthen decision-making regarding historic places within the local government. The program also provides

[8] Ibid., 2.

[9] All State Historical Landmarks from number 770 onward are also automatically listed on the California Register (California Office of Historic Preservation, Technical Assistance Series 5, 1).

federal funding and technical assistance to local governments via the State Historic Preservation Officer (SHPO) for preservation activities.

Project Review

Under the city's Historic Preservation Ordinance, projects that entail alteration of one or more designated historic properties, including contributing properties within historic districts, public infrastructure improvements, and streetscape features, are required to obtain a Certificate of Appropriateness (COA). Minor alterations, such as window and door replacements, are reviewed and approved or denied by the City's Planning and Development Services Department Manager, while major alterations, such as new additions or new public sidewalks, are reviewed and approved, conditionally approved, or denied by the Historic Preservation Commission.

Design review of minor and major alterations is conducted in accordance with the *Secretary of the Interior's Standards for Rehabilitation* as well as several local standards. Both minor and major alteration requests may be appealed to the City Council. Property modifications and alterations to non-contributing properties within a designated historic district are also required to obtain a COA. However, design review for non-contributing properties is based upon the impact of a proposed alteration to the historic district the non-contributing property resides within and whether the proposed alteration significantly alters the character or aesthetic value of the district. New construction within a historic district is an example of a non-contributing property that would require a COA.

A proposed demolition of any structure built prior to 1945 requires that a demolition permit application be submitted to the building division and considered by the Historic Preservation Commission for a COA. This includes properties that are not designated, as well as designated historic landmarks, contributing properties to a district, non-contributing properties within a district, and potentially eligible properties identified in the *Pomona Historic Resources Survey* or other surveys and studies.

In reviewing demolitions, the Commission is responsible for determining whether the property would likely meet at least one of the historic landmark criteria. If the Commission deems the property significant then a COA would be denied. However, if the owner establishes grounds for economic hardship and the Commission determines that economic hardship exists, then the Commission may approve, or conditionally approve the applicant's request for a demolition permit. If the Commission's findings for approval of economic hardship result in the demolition of a nominated or designated historic landmark, then the applicant is required to provide building recordation in accordance with the Historic American Building Survey (HABS) guidelines prior to the issuance of a demolition permit.

Pomona Historic Register Eligibility Criteria

As stipulated in Pomona's Historic Preservation Ordinance, an improvement, natural feature, or site may be designated a historic landmark by the historic preservation commission and city council and any area within the city of Pomona may be designated a historic district if the building or majority of buildings (in a district) are 50 or more years old (or of exceptional quality if less than 50 years old) and it meets one or more of the following criteria:

1. It exemplifies or reflects special elements of the city of Pomona's cultural, social, economic, political, aesthetic, engineering, architectural, or natural history;

2. It is identified with persons or events significant in local, state, or national history;

3. It embodies distinctive characteristics of a style, type, period, or method of construction, or is a valuable example of the use of indigenous materials or craftsmanship;

4. It contributes to the significance of an historic area, being a geographically definable area possessing a concentration of historic or scenic properties or thematically related grouping of properties which contribute to each other and are unified aesthetically by plan or physical development;

5. It is the work of a notable builder, designer, landscape designer or architect;

6. It has a unique location or singular physical characteristics or is a view or vista representing an established and familiar visual feature of a neighborhood, community, or the city of Pomona;

7. It embodies elements of architectural design, detail, materials, or craftsmanship that represent a significant structural or architectural achievement or innovation;

8. It is similar to other distinctive properties, sites, areas, or objects based on an historic, cultural, or architectural motif;

9. It reflects significant geographical patterns, including those associated with different eras of settlement and growth, particular transportation modes, or distinctive examples of park or community planning; or

10. It is one of the few remaining examples in the city of Pomona, region, state, or nation possessing distinguishing characteristics of an architectural or historical type or specimen.

4. DESIGNATED HISTORIC RESOURCES

4.1 Historical Overview of Pomona

Chapter 2 of the General Plan Update consists of an overview of the history of Pomona's development, broken into four eras (Early History; The Railroad Era; War and Postwar: Years of Rapid Growth; and The Mature and Built-out Suburb). We summarize that historical background information below for reference.

Native Americans associated with Shoshonean language group first settled the area that would eventually become Pomona three thousand to four thousand years before the arrival of the Spanish to California in 1769. After Mexican gained independence from Spain, the vast tracts of former Mission San Gabriel lands were divided and distributed to private citizens. In 1837, Don Ygnacio Palomares and Don Ricardo Vejar received the enormous Rancho San Jose, which encompassed all of present-day Pomona, as well as La Verne, Claremont, San Dimas and Glendora. Palomares and Vejar retained title to their land grant following assumption of American control of California in 1848, and American settlers began settling in the area. Louis Phillips purchased Vejar's portion of the Rancho in 1864 where he built a home (the extant Phillips Mansion) and encouraged others to settle near him. Phillips sold a portion of his land to William Rubottom, who in 1866 founded the village of Spadra (along Pomona Boulevard near Highway 57 in the western portion of today's Pomona).

Pomona's development began in earnest with the arrival of the Southern Pacific Railroad in the Pomona Valley in 1874. Spadra was the initial terminus, before the railroad was extended eastward to Colton in 1875. Under the leadership of Thomas Garey, the Los Angeles Immigration and Cooperative Land Association plotted a one-square-mile town site around the new train station in what eventually became Downtown Pomona. The Association developed Pomona's first streets and buildings, including Garey Avenue, the railroad depot and Palomares Hotel. The economy of the new town was driven by the citrus industry that had been established in the area by several enterprising individuals. Accordingly, the new town was named "Pomona" after the Roman goddess of fruit.

Initial growth of the town was slow, primarily due to the lack of a reliable water supply. This changed in the 1880s, when the Pomona Land and Water Development Company drilled a series of wells and built a pipeline serving both the town and the surrounding orchards. By 1886, Pomona was home to 2,300 residents and nearly 100 businesses. Pomona was incorporated in 1888, its population of four thousand residents making it the fifth largest city in Los Angeles County. Pomona was quickly established as a commercial and manufacturing center for the area, as well as the western anchor of the citrus-growing Inland Empire region.

Pomona grew steadily over the next several decades, surpassing 25,000 residents by 1930. In 1922, Pomona was established as the site of the Los Angeles County Fair. As automobile ownership increased and roadway networks expanded, Pomona witnessed the rapid growth and development characteristic of most of Southern California at this time. Downtown Pomona became a bustling urban center and the city added several new residential subdivisions, including Lincoln Park. In 1931, the Fox Theatre became the center of the city's nightlife.

The advent of World War II brought thousands of civilians to Pomona to work in war-related industries, much of it related to the region's growing aerospace industry. Pomona's population increased rapidly at this time, at an accelerated growth rate the city would maintain throughout the remainder of the twentieth century. During the war, the county fairgrounds served as both a temporary station for troops arriving from other parts of the country and as a temporary detention center for Japanese Americans prior to their relocation to internment camps farther inland.

The post-war building boom transformed Pomona, as multiple, large residential tracts characterized by modest homes of similar design were constructed on former agricultural land. Pomona's post-war landscape was also shaped by widespread automobile ownership and the expansion of the highway network, which prompted Pomona to sprawl outward. With the opening of Pomona's segment of the San Bernardino Freeway in 1954, Pomona was able to attract middle-class homeowners who commuted via car to central Los Angeles.

During this post-war period, portions of North and South Garey Avenues, Holt Avenue, Mission Boulevard, Indian Hill Boulevard and Foothill Boulevard became corridors of commercial "strip" development characterized by low-rise commercial buildings, parking lots, and tall, eye-catching signs designed to attract the attention of passing motorists. By contrast, Pomona's downtown commercial districts of old shops (and limited parking) along Second Street began to seem out-of-date and unattractive. In response, downtown merchants privately funded and built in 1962 a nine-block pedestrian mall along Second Street, the first of its type west of the Mississippi River. With competition, however, from strips and new freeway-adjacent malls with abundant parking, sales at the Second Street Mall were declining within 3 years of opening. More than a third of the mall's stores were closed within a decade, and Second Street was re-opened to automobile traffic in 1984.

Among many new institutions established in this period, most notable was a branch of the California State Polytechnic College, which opened on the Kellogg Ranch property in 1956. In addition, planning for County offices to locate downtown began in 1953, culminating in the construction of the County Courthouse and Civic Center complexes between 1962 and 1966.

By the 1960s, Pomona was an urbanized, well-developed city with established neighborhoods, a diverse population, an active employment base, full-service financial and administrative businesses, a strong local government, and diverse retail shops and services. In 1963, the City adopted the first Master Plan to respond to the rapid growth of the City - later updated in 1976 as the Pomona General Plan.

Pomona has changed considerably since the 1976 General Plan was adopted, with the city's population growing from 87,400 in 1970 to nearly 150,000 by 2010. Today, with few large sites left for large housing developments, infill and re-use are the primary remaining means to accommodate new housing and employment. Downtown Pomona is undergoing a slow but steady revitalization, most recently accented by the re-opening of the historic Fox Theater as a regional live entertainment venue to complement a mix of downtown restaurants, clubs, galleries, educational facilities, government offices, and residences.

4.2 Past Historic Survey Efforts in Pomona

Before 1992, the City of Pomona addressed historic preservation on a case-by-case basis, primarily supporting the preservation of properties sponsored by local preservation advocacy groups. Early architectural surveys were conducted in 1983 and 1984 that focused on Pomona's downtown commercial and civic core.

Pomona Historic Resources Survey (1992-94)

The City of Pomona, in cooperation with Pomona Heritage, sponsored the Pomona Historic Resources Survey in 1992. The survey, based on architectural considerations, was conducted between 1992 and 1994. The survey examined properties that were at least 50 years old at the time of the survey, and included properties dating from 1835 to 1942. The survey identified:

- 2,784 properties contributing to the history of Pomona, of which 382 are potential local landmarks, and 129 are potentially eligible to the National Register of Historic Places.
- Twelve potentially eligible local historic districts.
- Eight potentially eligible National Register districts.
- Sixteen themes important in developing Pomona's growth and development history.

Since the completion of the 1992–94 survey, several recommendations presented in the study have been implemented. This included the adoption of the Historic Preservation Ordinance (Section 5809-13 of Pomona's Zoning Ordinance) in 1995, which, *inter alia*, established Pomona's Historic Register, a list of formally adopted historic landmarks and historic districts.

Focused Survey of Potential 1945-1954 Historic Districts (2004)
As part of the prior General Plan Update, Heritage Architecture & Planning conducted a reconnaissance survey of neighborhoods and districts developed between 1945 and 1954 in the City of Pomona, in order to identify those areas with potential historic significance and to make recommendations for more in-depth reconnaissance or intensive survey work, if needed. The 2004 survey focused on eight areas:

- Bonita Tract
- East Pomona Residential Area (Indian Hill)
- Kellogg Park
- Kingsley Tract
- Palm Lakes Residential Area
- South Pomona Residential Area
- Westmont Tract
- Commercial Corridors (Garey Avenue, Holt Avenue, Mission Boulevard, and Foothill Boulevard)

Based upon the reconnaissance survey and initial historical research, three of these areas (Kellogg Park, Westmont Estates, and the Kingsley Tract) were identified as potential local historic districts. Further study and an intensive survey, including historical context, was recommended in order to substantiate initial reconnaissance findings, to determine contributing and noncontributing buildings, and to identify any contributing landscape features.

4.3 Designated Historic Districts
Currently, Pomona has two National Register historic districts and three locally designated historic districts, as shown in Figure 4.4-1.

Edison Historic District (NRHP)
The Edison Historic District was added to the National Register of Historic Places in 1986. The district, which is significant for its contribution to architecture and engineering, consists of 34 acres and includes eight contributing buildings located on the 500 block of W. Second Avenue and two buildings on the 600 block of W. Second Avenue. The district's period of significance is from 1875 through 1924. The Edison Historic District is not listed on the Pomona Historic Register; however, local designation was recommended in the Pomona Historic Resources Survey conducted in 1992–94.

Lincoln Park Historic District (NRHP and Local Designation)
The Lincoln Park Historic District is listed in the Pomona Historic Register and was added to the National Register of Historic Places in April 2004. This district is located in central Pomona and is roughly bordered by E. Holt Avenue, N. Garey Avenue, E. McKinley Avenue, and N. Towne Avenue. The Lincoln Park Historic District consists of more than 800 buildings, predominately single-family homes. The district also includes natural and streetscape features, such as Lincoln Park and several heritage trees. While the district's earliest homes were built in the 1890s, the predominant share of properties date from 1900 through the 1930s and include a large number of Craftsman-style homes. Lincoln Park Historic District was identified in the Pomona Historic Resources Survey conducted in 1992-94.

Wilton Heights Historic District (Local Designation)
The Wilton Heights Historic District is listed in the Pomona Historic Register. Wilton Heights is west of and adjacent to the Lincoln Park Historic District and, like that district, consists predominately of single-family homes. The Wilton Heights Historic District is roughly bordered by N. White Avenue, W. Orange

Grove Avenue, N. Garey Avenue and W. Holt Avenue. The Wilton Heights Historic District includes two districts that were identified in the 1992-94 Pomona Historic Resources Survey as potentially eligible for local and NRHP designation: the Alvarado-Randolph Historic District and the Gordon Park Historic District.

Hacienda Park Historic District (Local Designation)
The Hacienda Park Historic District was added to the Pomona Historic Register in October 2003. The district is located directly north of the Wilton Heights Historic District and, roughly between N. White and N. Garey Avenues, extends from W. Orange Grove Avenue to the parcels on the north side of W. McKinley Avenue. Hacienda Park Historic District reflects historic residential development patterns in the city and consists predominately of single-family homes built in the 1930s, 1940s or 1950s.

4.4 Designated Properties
Pomona features nine properties listed individually on the National Register of Historic Places, three California Historic Landmarks, and thirteen properties that are designated historical landmarks on the Pomona Historic Register. Pomona also includes five properties that have formally been determined eligible for listing on the NRHP.

Listed on National Register of Historic Properties (CHRSC 1S)
Pomona includes nine properties that have been listed individually on the National Register of Historic Places:

- Abraham Lincoln Elementary School, 1200 N. Gordon Avenue
- Barbara Greenwood Kindergarten, 332 W. McKinley Avenue [Note: shares parcel with NRHP-listed La Casa Primera]
- La Casa Alvarado, 1459 Old Settlers Lane
- La Casa Primera de Rancho San Jose, 1569 N. Park Avenue (also City of Pomona Landmark)
- Phillips Mansion, 2640 Pomona Boulevard (also City of Pomona Landmark)
- Pomona City Stables, 636 W. Monterey Avenue (also City of Pomona Landmark)
- Pomona Fox Theater, 102-144 E. Third Street (also City of Pomona Landmark)
- Pomona YMCA Building, 350 N. Garey Avenue (also City of Pomona Landmark)
- Ygnacio Palomares Adobe, located at 491 E. Arrow Highway (also CHL #372 and City of Pomona Landmark)

In California, any property listed on the National Register is automatically listed on the California Register. Additionally, the city's Historic Preservation Ordinance encourages that resources designated at the state or national levels are also registered as a local landmark.

Formally determined eligible for NRHP Listing (CHRSC 2S3/2S4)
Pomona includes five properties that have formally been determined eligible for listing on the NRHP, either by consensus through the Section 106 process (CHRSC 2S2) or through Part 1 Tax Certification (CHRSC 2D3/2S3):

- Mayfair Hotel, 115 E. Third Street (2S3; also City of Pomona Landmark)
- 527 E. Holt Avenue (2S2)
- Pomona Armory, National Guard Building, 600 S. Park Avenue (2S2)

- Rothrock Building, 351 S. Thomas Street (2D3)
- Pomona Southern Pacific Railroad Depot, 156 W. Commercial Street (2S2)

Each of these properties is listed on the California Register of Historical Resources.

California Historical Landmarks
California Historical Landmarks are numbered in order of designation. Those with number 770 or higher are automatically listed in the California Register of Historical Resources. Those with numbers below 770 must be re-evaluated and found CRHR-eligible in order to be listed.[10] In addition to the Palomares Adobe (CHL #372) mentioned above, Pomona is home to the following two California Historical Landmarks:

- Ayer Cottage, the first home of Pomona College, 1492 S. Hamilton Boulevard (formerly Fifth Street (Mission Boulevard) at S. White Street (CHL #289)
- Pomona Assembly Center–Temporary Detention Camp for Japanese Americans, 1101 W. McKinley Avenue (CHL #934)

City of Pomona Landmarks (CHRSC 5S1)
Finally, in addition to the six local landmarks identified in the NRHP section above, the City of Pomona has designated 12 properties as historical landmarks, for a total of 18 individual historical landmarks designated locally:

- Armour Residence, 1280 Los Robles Place
- Currier House and Carriage House, 2640 Pomona Boulevard [Note: shares parcel with NRHP-listed Phillips Mansion]
- Mayfair Hotel, 115 E. Third Street
- Old Sanctuary First Baptist Church, 501 N. Garey Avenue
- Pomona Ebell Club, 595 E. Holt Avenue
- Progress Bulletin, 300 S. Thomas Street
- Second Street Mall Improvements, Second Street
- Seventh Day Adventist Church, 360 W. 3rd Street
- Spadra Cemetery, 2884 Pomona Boulevard
- St. Joseph's Elementary School, 1200 W. Holt Avenue
- The Hugues Winery, 1427 S. Garey Avenue
- Vandor Molen Residence, 820 Hillcrest Drive

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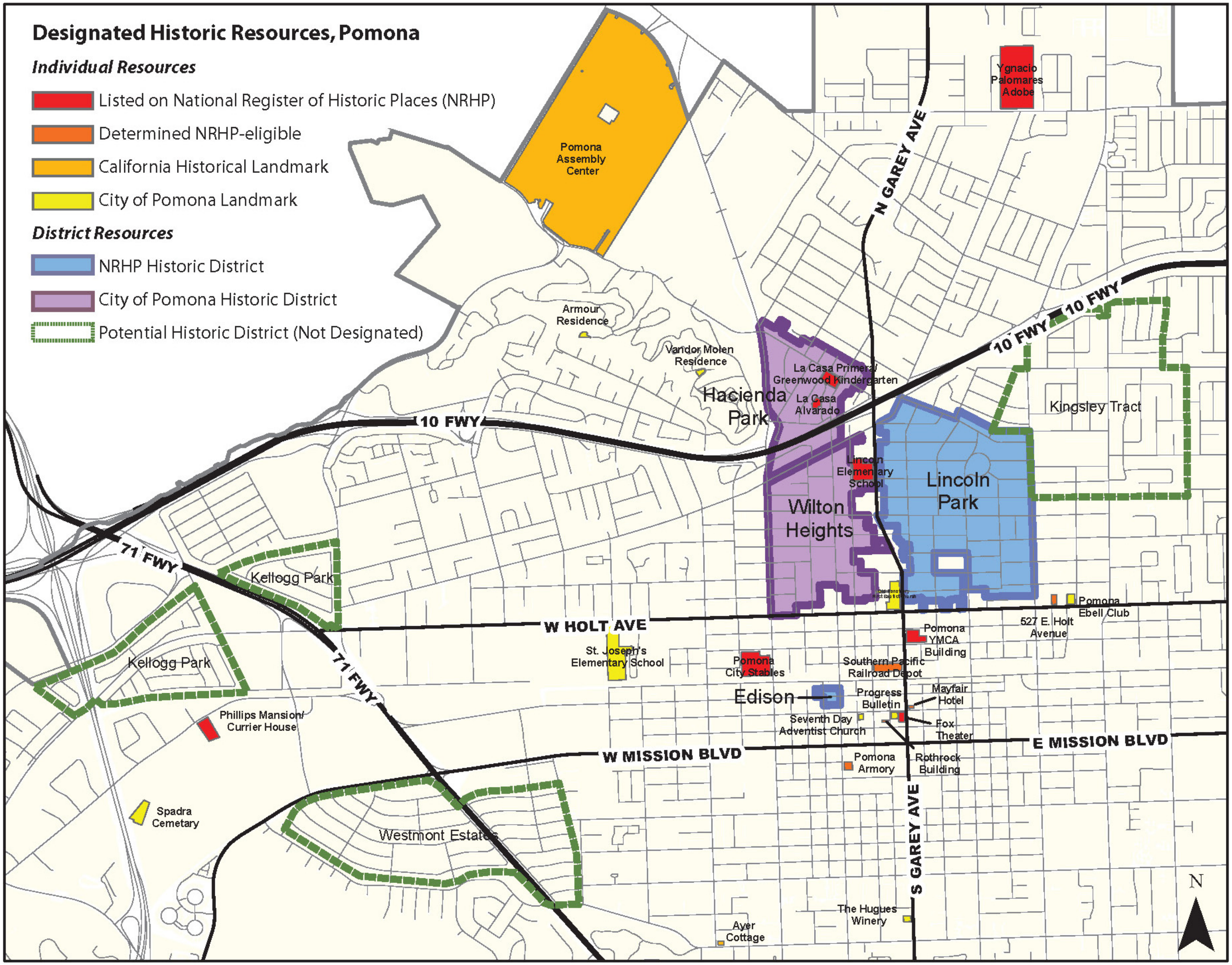
[10] California Public Resources Code, Section 5024.1.


Designated Historic Resources, Pomona
Individual Resources
Listed on National Register of Historic Places (NRHP)
Determined NRHP-eligible
California Historical Landmark
City of Pomona Landmark
District Resources
NRHP Historic District
City of Pomona Historic District
Potential Historic District (Not Designated)
Pomona Assembly Center
Ygnacio Palomares Adobe
N GAREY AVE
Armour Residence
Vandor Molen Residence
La Casa Primera/ Greenwood Kindergarten
La Casa Alvarado
Hacienda Park
10 FWY
Kingsley Tract
Lincoln Elementary School
Lincoln Park
Wilton Heights
71 FWY
Kellogg Park
Kellogg Park
W HOLT AVE
Pomona Ebell Club
527 E. Holt Avenue
Pomona YMCA Building
St. Joseph's Elementary School
Pomona City Stables
Southern Pacific Railroad Depot
Edison
Progress Bulletin
Mayfair Hotel
Seventh Day Adventist Church
Fox Theater
Phillips Mansion/ Currier House
W MISSION BLVD
E MISSION BLVD
Pomona Armory
Rothrock Building
Spadra Cemetary
Westmont Estates
S GAREY AVE
The Hugues Winery
Ayer Cottage
N

5. POTENTIALLY ELIGIBLE HISTORIC RESOURCES

5.1 Potentially Eligible Districts

We summarize below potential historic districts that have been identified in previous survey work. None of these districts has been formally designated at the local, state or national level.

Pomona Historic Resources Survey (1992)

The 1992-1994 Pomona Historic Resources Survey identified twelve historic districts that were considered potentially eligible for local designation and, in some cases, National Register designation. Some of these proposed districts have since been designated or incorporated into larger historic districts that have been designated by the City. Potential historic districts identified in the 1992-94 survey that have not been designated include:

- Berkshire Way-Windsor Place Historic District (Local)
- Center Street Historic District (NRHP & Local)
- Gordon-Park Historic District (Local; partially overlaps Wilton Heights Historic District)
- Hillcrest South Historic District (NRHP)
- Hillcrest North Historic District (Local)
- Kenoak Historic District (Local)
- Los Robles-Hillcrest Historic District (NRHP & Local)
- Presidential Park Historic District & Heritage Court (Local)

Focused Survey of Potential 1945-1954 Historic Districts (2004)

In 2004, Heritage Architecture & Planning completed a preliminary study to identify potential historic districts associated with Pomona's growth and development in the years following WWII. Three potential residential districts were identified through the *Focused Survey of Potential 1945-1954 Historic Districts*:

- Kellogg Park
- Westmont Estates
- Kingsley Tract

As stated in the Focused Survey document, additional survey work and historical research is needed to confirm these areas' potential status as historic districts. As of 2012, the City of Pomona has taken no formal action regarding any of these three potential districts.

5.2 Properties Previously Identified as Potentially Eligible

In addition to potential historic districts, the 1992-1994 Pomona Historic Resources Survey identified 382 properties as potentially eligible for individual designation on the Pomona Historic Register and 129 properties as eligible for individual designation on the National Register of Historic Places. Apart from the resources discussed above in Section 4.4, none of these properties has been formally designated at the local, state or national level. Because the 1992-1994 survey was completed nearly 20 years ago, any of these properties would need to be re-surveyed and re-evaluated prior to formal designation.

5.3 ARG Reconnaissance Survey
To evaluate potential impacts to historical resources related to the Pomona Corridors Specific Plan, ARG conducted a reconnaissance survey of properties within the plan area that are 50 years of age or older. While in the field, ARG identified and photographed properties within the Specific Plan area that (1) were 50 years of age or older; (2) preliminarily appear to meet state (California Register of Historical Resources) or local (City of Pomona) designation criteria; and (3) retain sufficient integrity to convey their significance. Previously designated properties were not surveyed.

Based on the survey results, ARG compiled a list of resources (Appendix A) that preliminarily appear to be eligible for the state and/or local designation criteria, per the requirements of CEQA. Each property in the list is identified by parcel number, address and date of construction, as well as a preliminary California State Historical Resource Status Code (CHRSC). The Specific Plan area includes approximately 2,200 parcels. Of these, ARG identified slightly more than 100 parcels that appear to be significant.

Many of the properties identified in Appendix A share common architectural characteristics and/or historical significance. Common property types include:

- Early-twentieth-century commercial buildings along the former 2nd Street pedestrian mall, between S. Main Street and S. Gibbs Street. These buildings are densely concentrated and, along with three adjacent contributors along S. Garey Avenue, appear to constitute a potential historic district.

- Single-family residences dating from the late nineteenth century or early twentieth century that are likely associated with Pomona's early growth and development. Some of these properties may also possess architectural significance. Some of these properties have since been converted to office or commercial uses.

- Office and/or commercial buildings that appear to be representative examples of Mid-century Modernism.

- Architecturally distinctive institutional buildings, including several churches and governmental buildings.

- Properties along Foothill Boulevard associated with the road's historic role as a portion of U.S. Route 66. These include a commercial building at 133 W. Foothill, two administrative buildings associated with the mobile home park at 402 E. Foothill, as well as distinctive signage at 222 and 760 E. Foothill.

Apart from the potential historic district along 2nd Street, the reconnaissance survey did not identify any other cluster of potential resources that is sufficiently unified by common historic themes, periods of significance, or architectural characteristics to be considered a potential district. In general, the properties identified in Appendix A are widely dispersed throughout the Specific Plan area.

As part of the reconnaissance survey process, ARG assigned preliminary California Historical Resource Status Codes (CHRSC) to surveyed properties. (See Appendix C for an explanatory list of CHRSCs.) Reflecting their potential eligibility, the properties identified in Appendix A were assigned CHRSCs of "3CS/5S3." The CHRSC rating 3CS indicates that the property appears eligible for the CRHR as an individual property through survey evaluation, while the 5S3 rating indicates that the property appears to be individually eligible for local listing or designation through survey evaluation. Similarly, contributing properties to a potential 2nd Street historic district were assigned CHRSCs of “3CD/5D3,” where 3CD indicates the property appears eligible for the CRHR as a contributor to a CRHR-eligible district through survey evaluation, and 5D3 indicates that the property appears to be a contributor to a district that appears eligible for local designation through survey evaluation. Finally, those potential district contributors that also appeared to be individually significant were given CHRSCs of “3CB/5B,” indicating that the properties appear to be eligible for CRHR and local designation both individually and as district contributors.

Note that CHRSCs assigned through this reconnaissance survey process indicate potential eligibility for designation, but are not equivalent to official designation or listing on any historic lists or registers. Further research is required to substantiate any formal listing on the California or Pomona Registers.

As addressed below in Section 8, detailed assessments of historic significance and integrity should be completed for any of the potential resources identified in Appendix A for which demolition or substantial alteration is proposed.

6. REGULATORY FRAMEWORK: CALIFORNIA ENVIRONMENTAL QUALITY ACT (CEQA)

When a proposed project may cause a substantial adverse change in the significance of an historical resource, the California Environmental Quality Act (CEQA) requires a city or county to carefully consider the possible impacts before proceeding (Public Resources Code Section 21098.1). CEQA equates a substantial adverse change in the significance of a historical resource with a significant effect on the environment (Section 21098.1). The Act explicitly prohibits the use of a categorical exemption within the CEQA Guidelines for projects that may cause such a change (Section 21084).

A “substantial adverse change” in the significance of a historical resource is defined as “physical demolition, destruction, relocation, or alteration of the resource or its immediate surroundings such that the significance of an historical resource would be materially impaired.” Further, that the significance of an historical resource is “materially impaired” when a project:

- “demolishes or materially alters in an adverse manner those physical characteristics of an historical resource that convey its historical significance and that justify its inclusion in, or eligibility for inclusion in the California Register of Historical Resources; or

- “demolishes or materially alters in an adverse manner those physical characteristics that account for its inclusion in a local register of historical resources... or its identification in an historical resources survey..., unless the public agency reviewing the effects of the project establishes by a preponderance of evidence that the resource is not historically or culturally significant; or

- “demolishes or materially alters in an adverse manner those physical characteristics of a historical resource that convey its historical significance and that justify its eligibility for inclusion in the California Register of Historical Resources as determined by a lead agency for purposes of CEQA.” (Guidelines Section 15064.5(b))

CEQA effectively requires preparation of a mitigated Negative Declaration or an EIR whenever a project may adversely impact historic resources. Current CEQA law provides that an EIR must be prepared whenever it can be fairly argued, on the basis of substantial evidence in the administrative record, that a project may have a significant effect on a historical resource (Guidelines Section 15064(f)(1)). A mitigated Negative Declaration may be used where all potentially significant effects can be mitigated to a level of insignificance (Guidelines Section 15064(f)(2)). For example, a mitigated Negative Declaration may be adopted for a project that mitigates significant effects on an historical resource by meeting the Secretary *of Interior's Standards for Rehabilitation* and local historic preservation regulations.

For the purposes of CEQA (Guidelines Section 15064.5), the term "historical resources" shall include the following:

1. A resource listed in, or determined to be eligible by the State Historical Resources Commission, for listing in, the California Register of Historical Resources (Pub. Res. Code Section 5024.1, Title 14 CCR, Section 4850 et.seq.).

2. A resource included in a local register of historical resources, as defined in Section 5020.1(k) of the Public Resources Code or identified as significant in an historical resource survey meeting the requirements of Section 5024.1(g) of the Public Resources Code, shall be presumed to be historically or culturally significant. Public agencies must treat any such resource as significant unless the preponderance of evidence demonstrates that it is not historically or culturally significant.

3. Any object, building, structure, site, area, place, record, or manuscript which a lead agency determines to be historically significant or significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California, may be considered to be an historical resource, provided the lead agency's determination is supported by substantial evidence in light of the whole record. Generally, a resource shall be considered by the lead agency to be "historically significant" if the resource meets the criteria for listing in the California Register of Historical Resources (Public Resources Code Section 5024.1, Title 14 CCR, Section 4852) as follows:

   A. Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage;

   B. Is associated with the lives of persons important in our past;

   C. 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

   D. Has yielded, or may be likely to yield, information important in prehistory or history. (Guidelines Section 15064.5)

7. PROPOSED GOALS AND POLICIES RELEVANT TO HISTORICAL RESOURCES

7.1 General Plan Update (Pomona Tomorrow)

The implementation section of the General Plan Update includes the following goals and policies pertaining to Historic Preservation (pp. 233-236):

Goals

7F.G8 Protect historic and cultural resources from demolition, inappropriate alterations and incompatible development.

7F.G9 Promote public awareness of the history of Pomona and historic preservation in the City.

7F.G10 Promote the protection and preservation of important archaeological sites.

Policies

7F.P20 Establish appropriate strategies to protect local cultural resources that do not qualify for designation as historic resources but reflect Pomona's history and traditions. Possible strategies include:

- Conservation districts for older neighborhoods with a unified distinctive character
- Conservation easements in environmentally sensitive areas like Lanterman and within Phillips Ranch

7F.P21 Consider adopting design review districts, specific plans, or other similar mechanisms to preserve the character of neighborhoods that have a unique design character. These areas may be considered for designation as historic districts, or may be designated as local cultural or design districts if they do not qualify for designation as a historic district.

7F.P22 Continue an active program to identify, interpret and designate the City's historic and cultural resources on a regular basis, including exploring the feasibility of establishing potential future historic districts and thematic districts.

7F.P23 Enhance incentives programs to encourage private property owners to maintain their historic properties.

7F.P24 Discourage the demolition or inappropriate alterations of historic buildings and ensure the protection of historic resources…through the continued enforcement of codes and design guidelines.

7F.P25 Update and maintain the Pomona Historic Resources Inventory by adopting a regular survey, inventory and evaluation program, including consideration of the potentially eligible historic resources that are identified in the Focused Survey of Potential 1945-1954 Historic Districts.

7F.P26 Seek grants to undertake a program to explore the feasibility of designating thematic historic districts within the City, such as Victorian residences or Master Architect buildings.

7F.P27 Criteria for establishment of such districts could include:

- Any of the criteria identified in Pomona City Code Section 5809-13 Historic Preservation.
- A group of resources that are contiguous or in close proximity and are thematically related properties possessing a concentration of historic, scenic, or thematic sites, architectural style, development period or other characteristics which contribute to each other and are unified aesthetically by plan, physical development or architectural quality.
- Significant patterns of development including those associated with different eras of settlement and growth, transportation modes or distinctive examples of park or community planning.

7F.P28 Consider the following designation criteria for the creation of merit districts, which allow for the recognition of their history but do not provide for a regulatory structure at this time:

- Any of the criteria identified in Pomona City Code Section 5809-13 Historic Preservation.
- A special area containing a contiguous set of contributing resources that may not merit City of Pomona District landmark designation, but should be acknowledged for their role in the City's history. This may include consideration of the cultural and economic conditions that led to their construction and thereby make them eligible for inclusion on the local register. (The District has the potential to be considered for a City District designation but does not provide for a preservation regulatory structure at this time.)

7F.P29 Consider the following neighborhoods…for creation of merit districts; conduct studies to determine contributing and non-contributing buildings and cultural landscape features:

- Westmont Estates
- Kellogg Park
- Kingsley Tract

7F.P30 Establish a program of incentives leveraging public and private resources, to promote historic preservation by property owners, using the menu of programs in Section 7-F as a guide.

7F.P31 Apply for matching grants available through the State Office of Historic Preservation for Certified Local Governments and encourage owners of historic properties to use the local, state and federal incentives and financial benefits available to them for restoring/maintaining their historic properties.

7F.P32 Per the requirements of the Certified Local Governments program, assign the responsibilities of a Historic Preservation Officer to a dedicated staff person to oversee and implement the historic preservation program.

7F.P33 Facilitate increased public outreach, education and information regarding historic preservation through a variety of methods, which could include:

- Creating a page dedicated to historic preservation on the City's website;
- Creating a brochure explaining the City's historic preservation program;
- Creating a Historic Preservation Month;
- Recognizing historic properties with special plaques, signage or public art;

- Working with local school districts to develop educational programs that inform school-aged children of local history and prehistory;
- Supporting continued development of the Pomona Public Library local history collection; and
- Establishing a program for walking tours.

7F.P34 Promote preservation of older historic landscapes and natural features that help to define neighborhoods or maintain the context of historic districts and landmarks. 7F.P35 Per the Guidelines for the California Environmental Quality Act (CEQA), require that new development avoid or reduce potential impacts to archaeological, paleontological and historic resources.

7F.P36 Per the requirements of Senate Bill 18, consult with California Native American tribes prior to the adoption or amendment of the General Plan or Specific Plans for the purpose of preserving, or mitigating impacts to, cultural places located on land within the City's jurisdiction that may be affected by the proposed Plan adoption or amendment.

7F.P37 Require that, prior to the issuance of a demolition or grading permit, developers of a property that contains a historic resource structure as defined by CEQA retain a qualified consultant to record the structure in accordance with U.S. Secretary of the Interior Guidelines (which includes drawings, photographs, and written data) and submit this information to the Pomona Historic Preservation Commission and City Planning Division.

7F.P38 Require that, prior to the demolition of a historic structure, developers offer the structure for relocation by interested parties.

7F.P39 Maintain sources of information regarding paleontological and archeological sites and the names and addresses of responsible organizations and qualified individuals, who can analyze, classify, record, and preserve paleontological or archeological findings.

7F.P40 Require a qualified paleontologist/archeologist to monitor all grading and/ or excavation where there is a potential to affect cultural, archeological or paleontological resources. If these resources are found, the applicant shall implement the recommendations of the paleontologist/archeologist, subject to the approval of the Planning Division.

7F.P41 Require new development to donate scientifically valuable paleontological or archaeological materials to a responsible public or private institution with a suitable repository, located within Pomona, or Los Angeles County, whenever possible.

7.2 Pomona Corridors Specific Plan

Regulations in the Corridors Specific Plan that pertain to the treatment of historical resources (including new construction adjacent to historical resources) are located in two sections of the Development Code (Book II):

2.3 Building Scale Regulations
2.8 Architecture Regulations

2.3 Building Scale Regulations
Section 2.3 of the Corridors Specific Plan's Development Code does not directly specify any special regulations pertaining to the scale of buildings constructed adjacent to or near a designated historical resource. Section 2.3.2, however, does specify special building height limits for properties (1) along Holt Avenue, Mission Boulevard or Garey Avenue; (2) across the street from housing; or (3) adjacent to housing. Regulations for development adjacent to housing establish the following relational height limit:

> The height of new development shall not exceed a line
> a. Originating at a height of one (1) floor above the height of the adjacent building's eave line
> b. Extending through a point located along the new development's side façade.
> c. With a forty-five (45) degree slope (creating a one (1) to one (1) height to stepback relationship).

2.8 Architecture Regulations
According to page 94 of the Corridors Specific Plan, the regulations in this section are "intended to ensure that new buildings and renovations contribute high quality development, support district character, maintain the desired human scale, and promote stability, value and investment." These regulations are broken into three sections: 2.8.1 Façade Requirements; 2.8.2 Architectural Guidelines; and 2.8.3 Architectural Character.

2.8.1 Façade Requirements
This section consists of regulations pertaining to façade and roof articulation, including base, top, and wall composition. The section identifies a variety of architectural elements that may be employed to satisfy the façade articulation requirements.

2.8.2 Architectural Guidelines
This section consists of a series of design guidelines applicable to new or renovated buildings (including freestanding parking structures) within the plan area. According to the Corridors Specific Plan, the architectural guidelines "encourage buildings that strengthen the quality and character of Pomona's corridors while providing ample opportunities for creativity and choice" (96). The guidelines are divided into four sections:

- Façade Guidelines
- Roof Guidelines
- Green Building Design Guidelines
- Color Guidelines

This section also includes detailed usage recommendations for wall cladding and materials as well as roof cladding and materials. These recommendations are organized by material type.

In general, the guidelines in this section do not speak directly to the issue of maintaining design consistency or complementarity between new development and adjacent historic resources. Important exceptions include:

- Guideline A1d:
  "The compositional arrangement and positioning of entrances, doors, and window openings on the façade should be designed in accordance with the building's and district's architectural style(s), and to support the building's relationship to pedestrian scale" (96).

- Guideline A4a(iii):
  "At additions and accessory buildings, windows should be of the same or related architectural style as the main building, including opening mechanisms and trim" (98).

- Guideline A8(i):
  "Wall cladding materials on additions and accessory buildings should be carried over from the primary building where possible" (100).

- Guideline B1b:
  "Roofs on additions and accessory buildings are encouraged to match the roof of the original or primary building in terms of materials, slope, detailing and style, to the degree possible."

2.8.3 Architectural Character
Section 2.8.3 consists of descriptions of common characteristics of the predominant architectural styles present in Pomona. Styles profiled include:

- Neoclassical Revival Styles (1895-1935)
- Early 20th Century Commercial Style (1900-1935)
- Craftsman/California Bungalow (1905-1925)
- Spanish Mission Revival/Mediterranean Style (1915-1935)
- Art Deco & "Exotic" Revival Decorative Styles (1925-1950)
- Contemporary Styles (1950s-present)

According to the Corridors Specific Plan, "[t]his information is intended to provide guidance for property owners, investors, developers and designers to make sensitive reference to, incorporate, and/or harmonize with characteristics of predominant architectural styles such as (but not limited to) massing, horizontal and vertical scale increments, façade composition, roof form, architectural elements, materials, and colors" (103).

8. PLAN IMPACTS AND MITIGATION MEASURES

We begin this section with a more detailed description of Pomona's existing regulatory process pertaining to development projects that may impact historical resources (summarized above in Section 3.3), as this robust process significantly reduces the likelihood of either the General Plan or the Corridors Specific Plan having significant impacts on historical resources.

8.1 Project Review in Pomona
As stipulated in Section 5809-13 of Pomona's Zoning Ordinance, any project that entails demolition or alteration of any designated historic properties, including contributing properties within historic districts, is required to obtain a Certificate of Appropriateness (COA). Minor alterations, such as window and door replacements, are reviewed and approved or denied by the City's Planning and Development

Services Department Manager, while major alterations, such as new additions or new public sidewalks, are reviewed and approved, conditionally approved, or denied by the Historic Preservation Commission.

According to Section 5809-13(F)(5) of Pomona's Zoning Ordinance, in reviewing a COA application, both planning staff and the Historic Preservation Commission "shall be guided by the following general standards in addition to the most current edition of the *Secretary of the Interior's Standards for Rehabilitation*:

a. Height. The height of any proposed construction shall be compatible with the height and bulk of surrounding structures and in conformance with the maximum allowable height for the applicable zoning district.
b. Proportions of Windows and Doors. The proportions and relationships between doors and windows shall be compatible with the architectural style and character of the surrounding structures, and be of an appropriate material.
c. Relationship of Building Masses and Spaces. The resulting relationships between proposed structures and created spaces, or between remodeled structures and created spaces, shall be consistent with the shapes and setbacks of existing adjacent structures.
d. Roof Shape. The designs of the roof shall be compatible with the architectural character and style of the surrounding structures. Gables, turrets, and other roof forms shall be incorporated when appropriate to accomplish design compatibility with adjacent structures.
e. Scale. The scale of the structure shall be compatible with the architectural character and style of the existing buildings. The new building shall blend in with surrounding buildings through the sensitive use of proper scale and materials.
f. Directional Expression/Facades. Facades in an historic district shall blend in with other structures with regard to directional expression. Structures in an historic district shall be compatible with the dominant horizontal and vertical expression of surrounding structures.
g. Architectural Details. Architectural details, including materials and textures shall be treated so as to make any new construction compatible with the architectural style and character of the historic district.
h. Architectural Rhythm and Articulation. All proposed structures or facade remodeling shall show sufficient and rhythmic repetition of architectural details so as to be compatible with the facade articulation of existing adjacent buildings.
i. New additions and adjacent related new construction shall be undertaken in such a manner that if removed in the future, the essential form and integrity of the historic property and its environment would be unimpaired.
j. All exterior mechanical equipment shall be screened from view with appropriately designed screens, parapet walls, landscaping or any other form of screening which the commission or the planning and development services manager may deem acceptable. The design, style, color and texture of the required screening method shall be compatible with the existing or proposed building/facade design."

In order to issue a COA for major alterations, the Historic Preservation Commission must make a determination that the following findings can be made with regards to the proposed work:

a. The proposed change will not adversely affect any significant historical, cultural, architectural, or aesthetic features of the concerned property or the historic district in which it is located.

b. The proposed change is compatible in architectural style with existing adjacent contributing structures in an historic district.
c. The proposed change is consistent with the architectural style of the building.
d. The scale, massing, proportions, materials, textures, fenestration, decorative features, and details proposed are consistent with the period and/or compatible with adjacent structures.
e. In case of demolition, the applicant must show that demolition of the subject structure(s) will not adversely affect any significant historical, cultural, architectural, or aesthetic features of the concerned property or the historic district in which it is located (Section 5809-13(F)(6)).

If a building permit application is filed for a noncontributing structure within an historic district (including new construction), staff shall review the permit for its potential to significantly alter the special character or aesthetic value of the district. If the exterior alterations or additions are deemed to have significant impact, then a hearing for a certificate of appropriateness would be required (Section 5809-13(F)(7)).

The proposed demolition of any structure built prior to 1945, whether or not it is an identified historical resource, requires that a demolition permit application be submitted to the building division and considered by the Historic Preservation Commission for a COA. In making a determination, the Historic Preservation Commission shall first consider if the property would likely satisfy the historic landmark designation criteria. If the property is deemed to be of historic significance, then the project would be denied a COA for demolition unless it meets the criteria for economic hardship (Section 5809-13(F)(8)).

If the Commission’s findings for approval of economic hardship result in the demolition of a nominated or designated historic landmark, then the applicant is required to provide building recordation in accordance with the Historic American Building Survey (HABS) guidelines prior to the issuance of a demolition permit (Section 5809-13(H)(10)).

8.2 Designated Historic Resources by Focus Area

The Pomona General Plan identifies those areas of the City with the potential for the most change under the objectives and goals espoused in the General Plan. These areas are primarily focused around the main roadway corridors of the City and the Downtown. The City’s estimated growth in population, retail uses and office uses is expected to be concentrated within 13 focus areas, 9 of which sit within the Corridors Specific Plan area. Six of these 13 focus areas contain designated historic resources. Only two focus areas – Downtown and North Garey Avenue (Downtown to I-10) – contain notable concentrations of historic resources.

General Plan Focus Areas within Corridors Specific Plan Area:

Foothill Boulevard

- No designated historic resources

North Metrolink TOD

- No designated historic resources

North Garey Avenue (I-10 to North Metrolink Station)

- No designated historic resources

North Garey Avenue (Downtown to I-10)

- Abraham Lincoln Elementary School, 1200 N. Gordon Avenue (NRHP)
- Old Sanctuary First Baptist Church, 501 N. Garey Avenue (Local Landmark)
- Lincoln Park Historic District (NRHP and Local District) – small area of overlap with focus area
- Wilton Heights Historic District (Local District) – small area of overlap with focus area

West Holt Avenue

- St. Joseph's Elementary School, 1200 W. Holt Avenue (Local Landmark)

West Holt Avenue/State Route 71 TOD

- No designated historic resources

East Holt Avenue

- 527 E. Holt Avenue (determined NRHP-eligible through Section 106 process)
- Pomona Ebell Club, 595 E. Holt Avenue (Local Landmark)

Mission Boulevard and South Garey Avenue

- The Hugues Winery, 1427 S. Garey Avenue (Local Landmark)

South Garey Avenue and Philadelphia Street

- No designated resources

General Plan Focus Areas outside Corridors Specific Plan Area:

Fairplex

- Pomona Assembly Center–Temporary Detention Camp for Japanese Americans, 1101 W. McKinley Avenue (California Historical Landmark #934)

Pomona Valley Hospital Medical Center (PVMHC)

- No designated historic resources

Downtown

- Pomona Fox Theater, 102-144 E. Third Street (NRHP and Local Landmark)
- Pomona YMCA Building, 350 N. Garey Avenue (NRHP and Local Landmark)
- Rothrock Building, 351 S. Thomas Street (determined NRHP-eligible through Part 1 Tax Certification)
- Pomona Southern Pacific Railroad Depot, 156 W. Commercial Street (determined NRHP-eligible through Section 106 process)
- Mayfair Hotel, 115 E. Third Street (Local Landmark)
- Progress Bulletin, 300 S. Thomas Street (Local Landmark)
- Second Street Mall Improvements, Second Street (Local Landmark)
- Seventh Day Adventist Church, 360 W. 3rd Street (Local Landmark)

Mission Boulevard/State Route 71

- No designated historic resources

8.3 Significance Threshold and Anticipated Impacts
Based on CEQA Guidelines Section 15064.5, the Pomona General Plan and the Pomona Corridors Specific Plan – and future development activities facilitated by those plans – would be considered to have a significant impact to historical resources if they would cause a substantial adverse change in the significance of a historical resource. Historical resources include properties eligible for listing on the National Register of Historic Places, the California Register of Historic Resources or the local register of historical resources. In addition, as explained in CEQA Guidelines Section 15064.5, "[s]ubstantial adverse change in the significance of an historical resource means physical demolition, destruction, relocation, or alteration of the resource or its immediate surroundings such that the significance of an historical resource would be materially impaired."

The potential of new development or related projects facilitated by the General and/or Specific Plans to affect historical resources is dependent upon the location of the proposed development with respect to identified historical resources within the plan area. Any future development project that is located near an identified historical resource would have the potential to result in a substantial adverse change to a historical resource. The types of project impacts that may cause a "substantial adverse change" in the significance of an historical resource include:

- Demolition or substantial alteration without consideration of historic features;
- Incompatible massing, size, scale or architectural style of new development adjacent to one or more historical resources;
- Obstruction or extensive shading of significant views to and from a historical resource by new development;
- Incompatible re-use of a historical resource;
- Disruption of a historical resource's integrity of setting; or
- Long-term loss of access to a historical resource.

As described in section 8.1, Pomona's existing development review processes protect locally designated historic resources from demolition, inappropriate alteration and incompatible adjacent development. While projects involving National or California Register-listed properties that are not designated locally would not trigger the certificate of appropriateness process, such projects would be subject to project-level CEQA review, which would necessarily include evaluation of potential project-related impacts to the National or California Register-listed properties. Pomona's historic preservation ordinance also protects any building constructed prior to 1945 from being demolished before it has been evaluated for local register eligibility. In addition, buildings constructed before 1949 that are located within the Downtown Pomona Specific Plan area (generally bound by Holt Avenue, Towne Avenue, Mission Boulevard and White Avenue) require a certificate of appropriateness for significant alterations. Finally, the General Plan includes several goals and policies that underscore that new projects in Pomona involving or adjacent to one or more historical resources shall be designed in keeping with local preservation standards as well as the *Secretary of the Interior's Standards*. As a result, the impact of the General Plan on historical resources is considered ***less than significant***.

The Pomona Corridors Specific Plan includes guidelines designed to foster building additions and new development that are compatible with existing historic resources. The plan, however, may have a significant impact on historical resources, by adversely affecting one or more potential historical resources within the Specific Plan area. These potential resources are not currently designated and have not been fully evaluated for local register eligibility.

Impact 1: Destruction or Inappropriate Alteration of Historical Resources
Future development projects that are otherwise consistent with the proposed Pomona Corridors Specific Plan may cause substantial adverse changes in one or more of the potential historical resources identified in Appendix A. Substantial adverse changes that may occur include demolition, relocation or alteration of one or more resources, such that the resource and/or the potential historic district in which it is located is "materially impaired." Specifically, future development projects that are otherwise consistent with the Specific Plan (1) may demolish or inappropriately alter one or more of the potential historical resources identified in Appendix A built after 1944; or (2) may inappropriately alter one or more of the potential historical resources identified in Appendix A built before 1945.

> ***Mitigation Measure 1: Complete Historic Resource Evaluations***
> Before issuing a permit to demolish or significantly alter any of the potential historical resources identified in Appendix A, the City shall require the completion of a historical evaluation of the affected potential resource(s). This evaluation shall be completed by an architectural historian satisfying the *Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation, Professional Qualifications Standards* and shall determine whether or not each of the affected potential resources appears eligible for designation as a local landmark or as a contributor to a local district.
>
> If a project is found to affect one or more resources that appear eligible for local designation, then the project shall be fully subject to the Certificate of Appropriateness procedures as specified in Section 5809-13(F) of Pomona's Zoning Ordinance. (In other words, for purposes of project review, the resource(s) found to be eligible for local designation shall be treated the same as locally designated resources, whether or not they have been formally designated.)

With implementation of Mitigation Measure 1, the impact of the Pomona Corridors Specific Plan on historical resources would be considered ***less than significant***.

8.4 Cumulative Impacts
Potential cumulative development could include the demolition or alteration of historic resources. Though historic resources may be listed in the NRHP or CRHR, or otherwise listed as historic or potentially historic in the CHRIS maintained by the Office of Historic Preservation, the listing itself often grants little or no inherent protection. Any development in the city would be subject to the requirements of CEQA and undergo CEQA review. With these requirements, coupled with the goals and policies of the proposed General Plan, protection of historical resources in the city would be considered feasible. Therefore the impact on historical resources of the proposed General Plan and Corridors Specific Plan would not be considered cumulatively considerable relative to the impact to historical resources resulting from cumulative development in the vicinity of the city. The cumulative impact would, therefore, be considered ***less than significant***.

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Appendix A: Potential Historic Resources, Corridors Specific Plan Area

General Plan Update and Pomona Corridors Specific Plan
Historic Resources Technical Report, Architectural Resources Group

Appendix A: Potential Historic Resources within the Corridors Specific Plan Area

APN	Number	Street	Year Built	Property Type	Preliminary CHRSC	Notes
8335009008	135	E 2ND ST	1918	commercial	3CD/5D3	potential contributor to 2nd Street district
8335009009	139	E 2ND ST	1939	commercial	3CD/5D3	potential contributor to 2nd Street district
8335009010	151	E 2ND ST	1905	commercial	3CD/5D3	potential contributor to 2nd Street district
8335010016	162-164	E 2ND ST	1934	commercial	3CB/5B	potential contributor to 2nd Street district
8335009011	161	E 2ND ST	1920	commercial	3CD/5D3	potential contributor to 2nd Street district
8335009014	185	E 2ND ST	1939	commercial	3CD/5D3	potential contributor to 2nd Street district
8335009015	197	E 2ND ST	1932	commercial	3CD/5D3	potential contributor to 2nd Street district
8335010008	198	E 2ND ST	1922	commercial	3CD/5D3	potential contributor to 2nd Street district
8335010014	200	E 2ND ST	1927	commercial	3CB/5B	potential contributor to 2nd Street district
8335009001	201	E 2ND ST	1938	commercial	3CD/5D3	potential contributor to 2nd Street district
8335010013	216	E 2ND ST	1931	commercial	3CD/5D3	potential contributor to 2nd Street district
8335010012	224	E 2ND ST	1911	commercial	3CD/5D3	potential contributor to 2nd Street district
8335010011	252	E 2ND ST	1926	commercial	3CD/5D3	potential contributor to 2nd Street district
8335010010	260-290	E 2ND ST	1948	commercial	3CD/5D3	potential contributor to 2nd Street district
8335009002	263	E 2ND ST	1927	commercial	3CD/5D3	potential contributor to 2nd Street district
8335009018	269	E 2ND ST	1925	commercial	3CD/5D3	potential contributor to 2nd Street district
8335009005	285-291	E 2ND ST	1931	commercial	3CD/5D3	potential contributor to 2nd Street district
8341004051	100	W 2ND ST	1963	commercial	3CB/5B	potential contributor to 2nd Street district
8341001035	153	W 2ND ST	1894	commercial	3CD/5D3	potential contributor to 2nd Street district
8341001009	171	W 2ND ST	1891	commercial	3CD/5D3	potential contributor to 2nd Street district
8341001034	173	W 2ND ST	1891	commercial	3CD/5D3	potential contributor to 2nd Street district
8341001011	195	W 2ND ST	1891	commercial	3CD/5D3	potential contributor to 2nd Street district
8341004018	248-266	W 2ND ST	1888	commercial	3CD/5D3	potential contributor to 2nd Street district
8348020021	1441	W 2ND ST	1953	office	3CS/5S3	former industrial property
8348021803	c. 1603	W 2ND ST	c.1930	utility	3CS/5S3	
8335011013	146	E 3RD ST	1924	commercial	3CB/5B	also 300 S Garey Ave; potential contributor to 2nd Street district
8359016037	286	W ARTESIA ST	1912	residence	3CS/5S3	
8359016038	290	W ARTESIA ST	1885	residence	3CS/5S3	
8337016012	563	N CASWELL AVE	1927	residence	3CS/5S3	
8367001009	222	E FOOTHILL BLVD	1947	mobile home park	3CS/5S3	sign only
8367002004	402	E FOOTHILL BLVD	1951	mobile home park	3CS/5S3	two admin bldgs only
8367003017	760	E FOOTHILL BLVD	1965	commercial	3CS/5S3	sign only
8302023008	133	W FOOTHILL BLVD	1954	commercial	3CS/5S3	
8336022015	499	N GAREY AVE	1962	commercial	3CS/5S3	
8336016026	570	N GAREY AVE	1929	chapel	3CS/5S3	
8336009012	715	N GAREY AVE	1960	commercial	3CS/5S3	building and sign
8336010001	889	N GAREY AVE	1955	commercial	3CS/5S3	
8359015031	1607	N GAREY AVE	1948	commercial	3CS/5S3	building and canopy
8359006011	1977	N GAREY AVE	1963	office	3CS/5S3	
8359005008	2001	N GAREY AVE	1961	office	3CS/5S3	
8371016012	2475	N GAREY AVE	1958	religious	3CS/5S3	
8371012809	2701	N GAREY AVE	1941/1966	train station	3CS/5S3	Santa Fe RR Station
8371012901	2701	N GAREY AVE	1941/1966	train station	3CS/5S3	Santa Fe RR Station
8371012902	2701	N GAREY AVE	1941/1966	train station	3CS/5S3	Santa Fe RR Station
8366009900	2704	N GAREY AVE	unknown	industrial	3CS/5S3	shed buildings associated with railroad
8370009040	3285	N GAREY AVE	1960	religious	3CS/5S3	formerly office or retail
8302023010	3641	N GAREY AVE	1932	religious	3CS/5S3	
8335010003	240-242	S GAREY AVE	1893	commercial	3CD/5D3	potential contributor to 2nd Street district
8335010004	250	S GAREY AVE	1948	commercial	3CD/5D3	potential contributor to 2nd Street district
8335025014	668	S GAREY AVE	1925	religious	3CS/5S3	
8335026900	800	S GAREY AVE	c. 1925	public	3CS/5S3	Pomona Unified School District building
8341017001	915	S GAREY AVE	1903	residence	3CS/5S3	
8331009035	2160	S GAREY AVE	1950	residence	3CS/5S3	
8326002010	851	HAWTHORNE PL	1910	residence	3CS/5S3	
8336016021	159	E HOLT AVE	1890	residence	3CS/5S3	student housing
8336019003	239	E HOLT AVE	1917	institutional	3CS/5S3	American Legion
8336020016	250	E HOLT AVE	1905	residence	3CS/5S3	student housing
8336020004	260	E HOLT AVE	1901	residence	3CS/5S3	
8337014024	305	E HOLT AVE	1964	commercial	3CS/5S3	

Appendix A: Potential Historic Resources within the Corridors Specific Plan Area

APN	Number	Street	Year Built	Property Type	Preliminary CHRSC	Notes
8337020028	560	E HOLT AVE	1947	commercial	3CS/5S3	
8337016028	563	E HOLT AVE	1929	residence	3CS/5S3	now commercial
8326001004	770	E HOLT AVE	1920	residence	3CS/5S3	now commercial
8326002002	846	E HOLT AVE	1911	residence	3CS/5S3	
8326020004	930	E HOLT AVE	1946	commercial	3CS/5S3	
8323017019	1229	E HOLT AVE	1957	commercial	3CS/5S3	
8326025029	1280	E HOLT AVE	1959	commercial	3CS/5S3	
8326026029	1600	E HOLT AVE	1954	commercial	3CS/5S3	early shopping mall
8336022002	154	W HOLT AVE	1929	commercial	3CS/5S3	extent of alterations unclear
8336022016	196	W HOLT AVE	1937	commercial	3CS/5S3	
8340027026	502	W HOLT AVE	1940	commercial	3CS/5S3	
8340027016	534	W HOLT AVE	1952	residence	3CS/5S3	early 20th C. house behind mid-century barber shop
8340026005	650	W HOLT AVE	1901	residence	3CS/5S3	
8340026006	658	W HOLT AVE	1935	residence	3CS/5S3	
8357011050	745	W HOLT AVE	1909	residence	3CS/5S3	
8357011049	757	W HOLT AVE	1908	residence	3CS/5S3	
8357011048	761	W HOLT AVE	1910	residence	3CS/5S3	
8348012043	784	W HOLT AVE	1958	commercial	3CS/5S3	sign only
8357012023	855	W HOLT AVE	1890	residence	3CS/5S3	house at rear of lot
8348009038	980	W HOLT AVE	1938	commercial	3CS/5S3	building and sign
8348008010	1146	W HOLT AVE	1955	religious	3CS/5S3	St. Joseph's Catholic Church
8357015031	1207	W HOLT AVE	1962	commercial	3CS/5S3	
8357017042	1535	W HOLT AVE	1903	residence	3CS/5S3	
8348005008	1600	W HOLT AVE	1963	commercial	3CS/5S3	
8323027003	550	INDIAN HILL BLVD	1960	commercial	3CS/5S3	
8323027007	550	INDIAN HILL BLVD	1960	commercial	3CS/5S3	
8371014024	120	E MAGNOLIA ST	1961	commercial	3CS/5S3	also 2585 N Garey Ave; sign only
8371014036	155	W MAGNOLIA ST	1929	residence	3CS/5S3	
8335022005	604	E MISSION BLVD	1902	residence	3CS/5S3	now commercial
8335022001	684	E MISSION BLVD	1920	residence	3CS/5S3	
8335020004	838	E MISSION BLVD	1925	commercial	3CS/5S3	
8335017057	931	E MISSION BLVD	1909	residence	3CS/5S3	
8335018006	940	E MISSION BLVD	1921	residence	3CS/5S3	
8335018008	964	E MISSION BLVD	1927	residence	3CS/5S3	
8326009018	1057	E MISSION BLVD	1954	commercial	3CS/5S3	originally McDonald's Restaurant #7
8326012005	1263	E MISSION BLVD	1910	residence	3CS/5S3	
8326012006	1269	E MISSION BLVD	1910	residence	3CS/5S3	
8327014005	1390	E MISSION BLVD	1913	auto court	3CS/5S3	
8326014007	1491	E MISSION BLVD	1926	residence	3CS/5S3	
8341008007	383	W MISSION BLVD	1957	office	3CS/5S3	
8341007025	435	W MISSION BLVD	1958	offices	3CS/5S3	
8342012006	725	W MISSION BLVD	1909	residence	3CS/5S3	
8342013012	766	W MISSION BLVD	1903	residence	3CS/5S3	
8342013011	780	W MISSION BLVD	1904	residence	3CS/5S3	now commercial
8342013020	888	W MISSION BLVD	1957	commercial	3CS/5S3	
8342019010	1060	W MISSION BLVD	1906	residence	3CS/5S3	
8323006014	545	N MTN VIEW AVE	1910	residence	3CS/5S3	
8359015004	1682	N PARK AVE	1905	residence	3CS/5S3	
8359014016	1751	N PARK AVE	1948	religious	3CS/5S3	
8337016025	588	E PASADENA ST	1910	residence	3CS/5S3	
8336017017	164	E PEARL ST	1923	religious	3CS/5S3	also 600 N Garey Ave
8359007022	151	W WILLOW ST	1951	office	3CS/5S3	
8359007025	155	W WILLOW ST	1951	office	3CS/5S3	

Appendix B: The Secretary of the Interior's Standards for Rehabilitation

Appendix B: The Secretary of the Interior's Standards for Rehabilitation

The Secretary of the Interior is responsible for establishing standards for all programs under Departmental authority and for advising Federal agencies on the preservation of historic properties listed in or eligible for listing in the National Register of Historic Places. The *Standards for Rehabilitation* (codified in 36 CFR 67 for use in the Federal Historic Preservation Tax Incentives program) address the most prevalent treatment. "Rehabilitation" is defined as "the process of returning a property to a state of utility, through repair or alteration, which makes possible an efficient contemporary use while preserving those portions and features of the property which are significant to its historic, architectural, and cultural values."

Initially developed by the Secretary of the Interior to determine the appropriateness of proposed project work on registered properties within the Historic Preservation Fund grant-in-aid program, the *Standards for Rehabilitation* (the *Standards*) have been widely used over the years—particularly to determine if a rehabilitation qualifies as a Certified Rehabilitation for Federal tax purposes. In addition, the *Standards* have guided Federal agencies in carrying out their historic preservation responsibilities for properties in Federal ownership or control; and State and local officials in reviewing both Federal and nonfederal rehabilitation proposals. They have also been adopted by historic district and planning commissions across the country.

The intent of the *Standards* is to assist the long-term preservation of a property's significance through the preservation of historic materials and features. The *Standards* pertain to historic buildings of all materials, construction types, sizes, and occupancy and encompass the exterior and interior of the buildings. They also encompass related landscape features and the building's site and environment, as well as attached, adjacent, or related new construction. To be certified for Federal tax purposes, a rehabilitation project must be determined by the Secretary of the Interior to be consistent with the historic character of the structure(s), and where applicable, the district in which it is located.

The Standards are to be applied to specific rehabilitation projects in a reasonable manner, taking into consideration economic and technical feasibility.

The ten Standards are:

1. A property shall be used for its historic purpose or be placed in a new use that requires minimal change to the defining characteristics of the building and its site and environment.

2. The historic character of a property shall be retained and preserved. The removal of historic materials or alteration of features and spaces that characterize a property shall be avoided.

3. Each property shall be recognized as a physical record of its time, place, and use. Changes that create a false sense of historical development, such as adding conjectural features or architectural elements from other buildings, shall not be undertaken.

4. Most properties change over time; those changes that have acquired historic significance in their own right shall be retained and preserved.

5. Distinctive features, finishes, and construction techniques or examples of craftsmanship that characterize a property shall be preserved.

6. Deteriorated historic features shall be repaired rather than replaced. Where the severity of deterioration requires replacement of a distinctive feature, the new feature shall match the old in design, color, texture, and other visual qualities and, where possible, materials. Replacement of missing features shall be substantiated by documentary, physical, or pictorial evidence.

7. Chemical or physical treatments, such as sandblasting, that cause damage to historic materials shall not be used. The surface cleaning of structures, if appropriate, shall be undertaken using the gentlest means possible.

8. Significant archeological resources affected by a project shall be protected and preserved. If such resources must be disturbed, mitigation measures shall be undertaken.

9. New additions, exterior alterations, or related new construction shall not destroy historic materials that characterize the property. The new work shall be differentiated from the old and shall be compatible with the massing, size, scale, and architectural features to protect the historic integrity of the property and its environment.

10. New additions and adjacent or related new construction shall be undertaken in such a manner that if removed in the future, the essential form and integrity of the historic property and its environment would be unimpaired.

In general, projects that are in compliance with the *Standards* are considered under CEQA to have a less-than-significant impact on historic resources.

Appendix C: California Historical Resource Status Codes

California Historical Resource Status Codes

1	**Properties listed in the National Register (NR) or the California Register (CR)**
1D	Contributor to a district or multiple resource property listed in NR by the Keeper. Listed in the CR.
1S	Individual property listed in NR by the Keeper. Listed in the CR.
1CD	Listed in the CR as a contributor to a district or multiple resource property by the SHRC
1CS	Listed in the CR as individual property by the SHRC.
1CL	Automatically listed in the California Register – Includes State Historical Landmarks 770 and above and Points of Historical Interest nominated after December 1997 and recommended for listing by the SHRC.
2	**Properties determined eligible for listing in the National Register (NR) or the California Register (CR)**
2B	Determined eligible for NR as an individual property and as a contributor to an eligible district in a federal regulatory process. Listed in the CR.
2D	Contributor to a district determined eligible for NR by the Keeper. Listed in the CR.
2D2	Contributor to a district determined eligible for NR by consensus through Section 106 process. Listed in the CR.
2D3	Contributor to a district determined eligible for NR by Part I Tax Certification. Listed in the CR.
2D4	Contributor to a district determined eligible for NR pursuant to Section 106 without review by SHPO. Listed in the CR.
2S	Individual property determined eligible for NR by the Keeper. Listed in the CR.
2S2	Individual property determined eligible for NR by a consensus through Section 106 process. Listed in the CR.
2S3	Individual property determined eligible for NR by Part I Tax Certification. Listed in the CR.
2S4	Individual property determined eligible for NR pursuant to Section 106 without review by SHPO. Listed in the CR.
2CB	Determined eligible for CR as an individual property and as a contributor to an eligible district by the SHRC.
2CD	Contributor to a district determined eligible for listing in the CR by the SHRC.
2CS	Individual property determined eligible for listing in the CR by the SHRC.
3	**Appears eligible for National Register (NR) or California Register (CR) through Survey Evaluation**
3B	Appears eligible for NR both individually and as a contributor to a NR eligible district through survey evaluation.
3D	Appears eligible for NR as a contributor to a NR eligible district through survey evaluation.
3S	Appears eligible for NR as an individual property through survey evaluation.
3CB	Appears eligible for CR both individually and as a contributor to a CR eligible district through a survey evaluation.
3CD	Appears eligible for CR as a contributor to a CR eligible district through a survey evaluation.
3CS	Appears eligible for CR as an individual property through survey evaluation.
4	**Appears eligible for National Register (NR) or California Register (CR) through other evaluation**
4CM	Master List - State Owned Properties – PRC §5024.
5	**Properties Recognized as Historically Significant by Local Government**
5D1	Contributor to a district that is listed or designated locally.
5D2	Contributor to a district that is eligible for local listing or designation.
5D3	Appears to be a contributor to a district that appears eligible for local listing or designation through survey evaluation.
5S1	Individual property that is listed or designated locally.
5S2	Individual property that is eligible for local listing or designation.
5S3	Appears to be individually eligible for local listing or designation through survey evaluation.
5B	Locally significant both individually (listed, eligible, or appears eligible) and as a contributor to a district that is locally listed, designated, determined eligible or appears eligible through survey evaluation.
6	**Not Eligible for Listing or Designation as specified**
6C	Determined ineligible for or removed from California Register by SHRC.
6J	Landmarks or Points of Interest found ineligible for designation by SHRC.
6L	Determined ineligible for local listing or designation through local government review process; may warrant special consideration in local planning.
6T	Determined ineligible for NR through Part I Tax Certification process.
6U	Determined ineligible for NR pursuant to Section 106 without review by SHPO.
6W	Removed from NR by the Keeper.
6X	Determined ineligible for the NR by SHRC or Keeper.
6Y	Determined ineligible for NR by consensus through Section 106 process – Not evaluated for CR or Local Listing.
6Z	Found ineligible for NR, CR or Local designation through survey evaluation.
7	**Not Evaluated for National Register (NR) or California Register (CR) or Needs Revaluation**
7J	Received by OHP for evaluation or action but not yet evaluated.
7K	Resubmitted to OHP for action but not reevaluated.
7L	State Historical Landmarks 1-769 and Points of Historical Interest designated prior to January 1998 – Needs to be reevaluated using current standards.
7M	Submitted to OHP but not evaluated - referred to NPS.
7N	Needs to be reevaluated (Formerly NR Status Code 4)
7N1	Needs to be reevaluated (Formerly NR SC4) – may become eligible for NR w/restoration or when meets other specific conditions.
7R	Identified in Reconnaissance Level Survey: Not evaluated.
7W	Submitted to OHP for action – withdrawn.

Appendix D Traffic Impact Analysis

DRAFT Report

City of Pomona General Plan Corridors Plan and Active Transportation Plan EIR Transportation Impact Analysis

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Updated July 2013

City of Pomona General Plan

Corridors Plan

And Active Transportation Plan EIR

Transportation Impact Analysis

Draft Report

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OC12-0206

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1.0 INTRODUCTION

The purpose of the report is to summarize the findings of the traffic analyses completed for the City of Pomona General Plan, Corridors Specific Plan, and the Pomona Active Transportation Plan for the Environmental Impact Report (EIR). The purpose of this document is to identify the measures necessary to mitigate impacts associated with each of these planning efforts. A brief description of the analyses scenarios will be given as well as the assumptions used.

This Traffic Impact Analysis (TIA) was developed based on the requirements within the City of Pomona's Proposed General Plan and Circulation Element (2012), the City's Traffic Impact Analysis Guidelines (February 2012), the Congestion Management Program (CMP) Guidelines, and the CEQA Guidelines.

1.1 Project Description

This EIR assessment incorporates evaluation of three major planning efforts for the City of Pomona:

- City of Pomona 2011 General Plan Update, Pomona Tomorrow (City of Pomona Public Review Draft, March 2011),
- Pomona Corridors Specific Plan (Administrative Draft, September 2011)
- City of Pomona Active Transportation Plan (Fehr & Peers, November 2012)

All three documents assist the City in their advanced planning efforts as described below. Additionally, land use allocations by development area were provided to Fehr & Peers for incorporation into this assessment.

1.1.1 CITY OF POMONA 2011 GENERAL PLAN UPDATE

The General Plan is the key guiding document for the City of Pomona. It includes goals, policies, and mapping that will guide the development of the City into the future. Its five key purposes are to:

1. Outline a vision for Pomona's long-range physical evolution, economic development, and resource conservation
2. Provide strategies and specific implementing actions that will allow the vision to be accomplished
3. Establish a basis for judging whether development proposals and public projects are in harmony with the City's vision
4. Allow City departments, other public agencies, and private developers to plan projects that will enhance the character of the community
5. Provide the basis for establishing and setting priorities for detailed plans and implementing programs.

The General Plan provides the policies and programs that are used to assess needs within the community. As such, it identifies the following attributes which are included in this assessment:

- Development potential in the City (inclusive of the Corridors Specific Plan)
- Level of service policies for automobiles on City roadways
- Planned roadway infrastructure
- Pedestrian and bicycle circulation recommendations
- Goals and policies related to land use and transportation.

1.1.2 POMONA CORRIDORS SPECIFIC PLAN

The Corridors Specific Plan was established to orchestrate private and public investment activities along the Garey Avenue, Holt Avenue, Mission Boulevard, and Foothill Boulevard corridors. These specific corridors are referenced in the Pomona General Plan and are expected to be guided for development by the Corridors Specific Plan.

1.1.3 ACTIVE TRANSPORTATION PLAN

In the Pomona General Plan, it is acknowledged that cycling is important to assist in reducing traffic, air pollution, energy consumption, and provides greater transportation options to enhance the quality of life. The pedestrian environment has also been improved throughout the City, but in particular in the Downtown area of the City. The Plan is consistent with these efforts as it provides detailed direction on how to continue the City's progress toward better bicycling and walking environments. This is accomplished through proposing bicycle and pedestrian facilities, development of support facilities (such as bicycle parking and education programs), and by identifying potential recommendations for improving safety. The document also satisfies the requirements for the California Bicycle Transportation Act, making the City eligible to pursue funding through the Bicycle Transportation Account (BTA) through Caltrans.

1.2 Project Study Area

The City of Pomona is comprised of 22.84 square miles. As a hub between the eastern end of San Gabriel Valley and western edge of the San Bernardino-Riverside region, Pomona is positioned at the conflux of Interstate 10 (I-10), State Route 57 (SR-57), State Route 71 (SR-71), and State Route 60 (SR-60) freeways. It is also just ten miles from Ontario International Airport. Pomona is surrounded by the cities of Claremont, La Verne, San Dimas, Walnut, Diamond Bar, Chino, Chino Hills, and Montclair. The main campus of California Polytechnic University, Pomona, is located partly inside and outside the city boundaries between the cities of Pomona and Walnut.

SR-57 runs north to south near the western edge of the City. SR-71 diagonally transects the western half of the City, and I-10 runs east to west about one mile north of Downtown. A fourth freeway, SR-60, runs east to west through the hills along the southern edge of the City, separating a residential neighborhood, some major commercial uses, light-industrial/business park uses, and the Diamond Ranch High School from the rest of the City.

Pomona is also traversed by an east-west Union Pacific/Amtrak/Metrolink-Riverside rail line running through the center of Downtown and an east-west Metrolink-San Bernardino line running through the northern part of the City. Like the freeway rights-of-way, the trackways also function as hard neighborhood edges and to some degree, barriers between parts of the City.

While the majority of the City's land area is occupied by residential neighborhoods, other major land uses include public lands and industrial uses. Commercial and professional offices are amongst the least extensive uses.

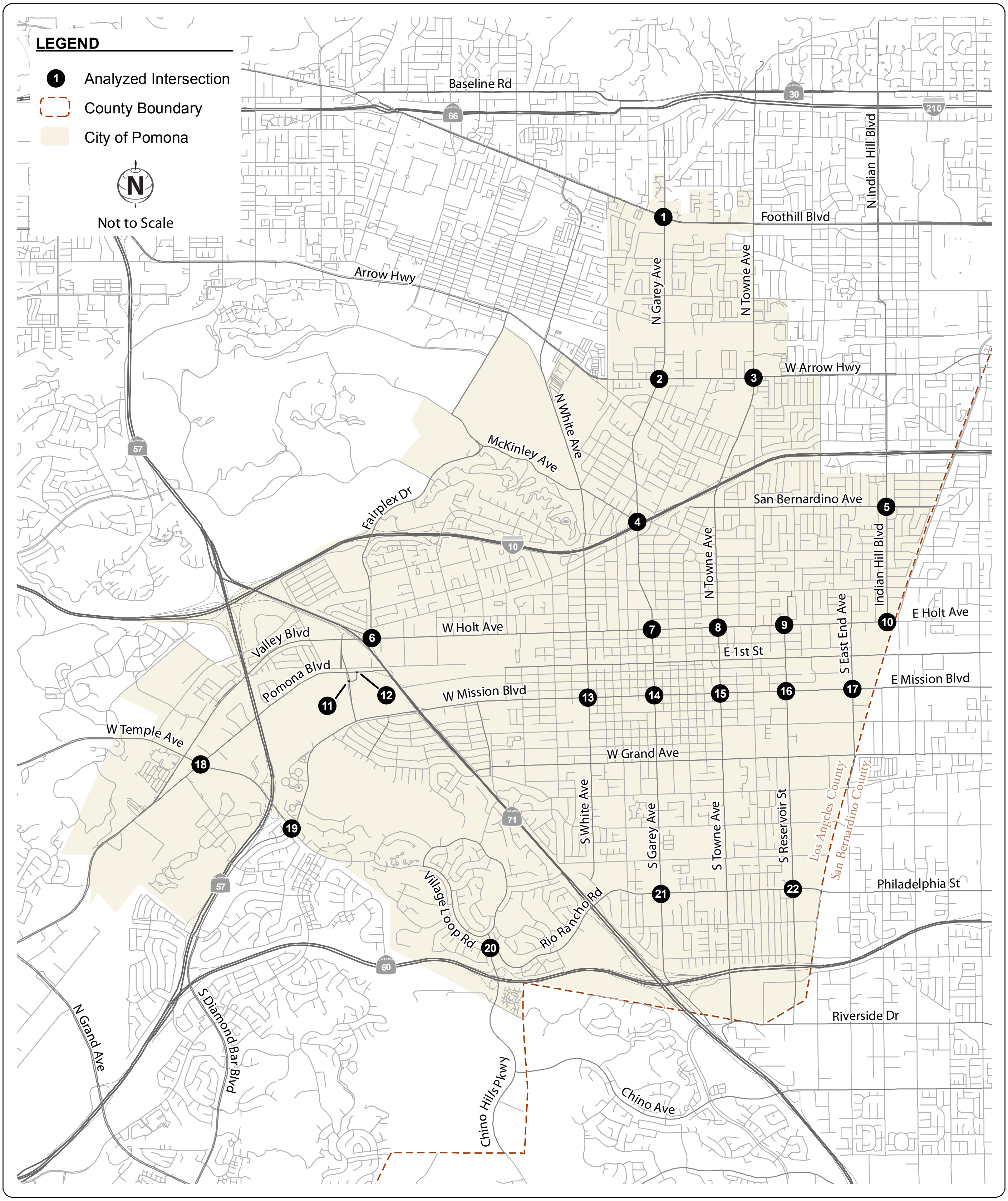
Fehr & Peers worked with City staff and identified 22 study intersections and three study roadway segments for evaluation in this study.

1.2.1 STUDY INTERSECTIONS

Below is a list of the intersections selected for analysis and confirmed by City staff.

1. Garey Avenue & Foothill Boulevard
2. Garey Avenue & Arrow Highway
3. Towne Avenue & Arrow Highway
4. Garey Avenue & McKinley Avenue & I-10 On Ramp
5. Indian Hill Boulevard & San Bernardino Avenue
6. Fairplex Drive & Holt Avenue
7. Garey Avenue & Holt Avenue
8. Towne Avenue & Holt Avenue
9. Reservoir Street & Holt Avenue
10. Indian Hill Boulevard & Holt Avenue
11. Humane Way & Roselawn Avenue
12. Roselawn Avenue & Pomona Boulevard
13. White Avenue & Mission Boulevard
14. Garey Avenue & Mission Boulevard
15. Towne Avenue & Mission Boulevard
16. Reservoir Street & Mission Boulevard
17. East End Avenue & Mission Boulevard
18. Pomona Boulevard & West Temple Avenue
19. Mission Boulevard & Temple Avenue
20. Phillips Ranch Road & Rio Rancho Road
21. Garey Avenue & Philadelphia Street
22. Reservoir Street & Philadelphia Street

Figure 1-1 displays the study area and analyzed intersections.



FEHR PEERS

STUDY AREA AND ANALYZED INTERSECTIONS

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FIGURE 1-1

1.3 Analysis Scenarios

To identify significant project impacts, Fehr & Peers evaluated the following scenarios for study area intersections and roadway segments as part of the proposed project:

- Existing Year (2012) Traffic Conditions– Consists of existing counts collected in the study area between 2007 and 2012.
- Future Buildout (2035) Plus Project Traffic Conditions – Includes buildout of the three project components (General Plan, Corridors Specific Plan, and the Active Transportation Plan), Funded roadway improvement projects identified in the 2012 Southern California Association of Governments (SCAG) Regional Transportation Plan (RTP), and SCAG-projected growth for areas outside of the City based on the SCAG 2012 RTP Travel Demand Forecasting Model.

1.4 Data Collection

Peak period intersection counts were conducted from 7:00 to 9:00 AM and 4:00 to 6:00 PM. Some of this data was available from the City which was supplemented with new counts on area roadways and area intersections. Table 1-1 indicates the source for each of the analyzed intersections. Daily traffic counts for roadway segments were conducted over a twenty four-hour period for the analyzed roadway segments. Table 1-2 outlines the source for each segment.

TABLE 1-1 – ANALYZED INTERSECTION DATA COLLECTION SOURCES		
Location	Source	Date
1. Garey Ave & Foothill Blvd	Pomona Corridor Specific Plan	04-2011
2. Garey Ave & Arrow Hwy	Pomona Corridor Specific Plan	04-2011
3. Towne Ave & Arrow Hwy	Pomona Valley Hospital Specific Plan	04-2009
4. Garey Ave & McKinley Ave & I-10 On-Ramp	Pomona Corridor Specific Plan	04-2011
5. Indian Hill Blvd & San Bernardino Ave	Pomona General Plan EIR	2007
6. Fairplex Dr & Holt Ave	Pomona Corridor Specific Plan	04-2011
7. Garey Ave & Holt Ave	`Pomona Corridor Specific Plan	04-2011
8. Towne Ave & Holt Ave	Pomona Corridor Specific Plan	04-2011
9. Reservoir St & Holt Ave	NDS Counts	05-2012
10. Indian Hill Blvd & Holt Ave	Pomona General Plan EIR	2007
11. Humane Way & Roselawn Ave	NDS Counts	05-2012
12. Roselawn Ave & Pomona Blvd	NDS Counts	05-2012
13. White Ave & Mission Blvd	Pomona Corridor Specific Plan	04-2011
14. Garey Ave & Mission Blvd	Pomona Corridor Specific Plan	04-2011
15. Towne Ave & Mission Blvd	Pomona Corridor Specific Plan	04-2011
16. Reservoir St & Mission Blvd	Pomona Corridor Specific Plan	04-2011
17. East End Ave & Mission Blvd	Pomona General Plan EIR	2007
18. Pomona Blvd & West Temple Ave	Cal Poly Pomona Master Plan	10-2008
19. Mission Blvd & Temple Ave	Pomona General Plan EIR	2007
20. Phillips Ranch Rd & Rio Rancho Rd	Pomona General Plan EIR	2007
21. Garey Ave & Philadelphia St	Pomona General Plan EIR	2007
22. Reservoir St & Philadelphia St	Pomona General Plan EIR	2007

TABLE 1-2 – ANALYZED ROADWAY SEGMENT DATA COLLECTION SOURCES		
Location	**Source**	**Date**
1. Village Loop Road (Mill Valley Rd to North Ranch Rd)	NDS Counts	05-2012
2. Westmont Ave (Brea Canyon Rd to Buffington St)	NDS Counts	05-2012
3. Humane Way (Roselawn Ave to Valley Blvd)	NDS Counts	05-2012

2.0 Existing Condition

This chapter discusses the existing transportation conditions in the project study area including the roadway, transit, and pedestrian networks.

2.1 EXISTING ROADWAY FACILITIES

The five major freeways serving the Pomona sub-region provide primary regional access to and from the City and described in detail below.

2.1.1 REGIONAL ROADS

- San Bernardino Freeway (I-10)—I-10 provides east-west access to Pomona from Santa Monica and Los Angeles to the west, and Ontario, San Bernardino, and Riverside to the east. The freeway has four lanes in either direction with an additional lane designated for high occupancy vehicles (HOV).
- Pomona Freeway (SR-60) - SR-60 is a 10 lane (five in either direction) freeway which provides access east to west, south of the I-10. One lane in either direction is designated for HOV.
- Foothill Freeway (I-210) - I-210 provides an additional east-west connection to the north of Pomona, extending west to Pasadena and the San Fernando Valley. The roadway has four lanes, one of which is designated as HOV, in either direction.
- Corona Expressway (SR-71) - SR-71 is a freeway through Chino and Chino Hills. It changes to an expressway between the SR-60 and the I-10. The roadway is two lanes in either direction with an additional left or right turning lane at parts. There has been construction work along the expressway, and most recently an overpass was completed over the interchange at Mission Boulevard. There are plans to widen SR-71 to a standard 8-lane facility by adding one mixed-flow lane in each direction plus a HOV lane.
- Orange Freeway (SR-57) - SR-57 provides the City with connections to Corona and Orange County. The roadway has four lanes in either direction and is divided by a barrier.

2.1.2 LOCAL ACCESS ROADS

- Garey Avenue - Garey Avenue is classified as a minor arterial by the City's General Plan. It runs north to south. There are two lanes in either direction, as well as a center turning lane. Sections of the roadway are divided by a raised median, and there is a posted speed limit of 35 MPH. On-street parking is allowed.
- Holt Avenue - Holt Avenue runs east to west and is classified as a major arterial street in the General Plan. There are three lanes in either direction with a center turning lane. While there are

some intersections where it is allowed, on-street parking is generally prohibited. The posted speed limit is 35 MPH.

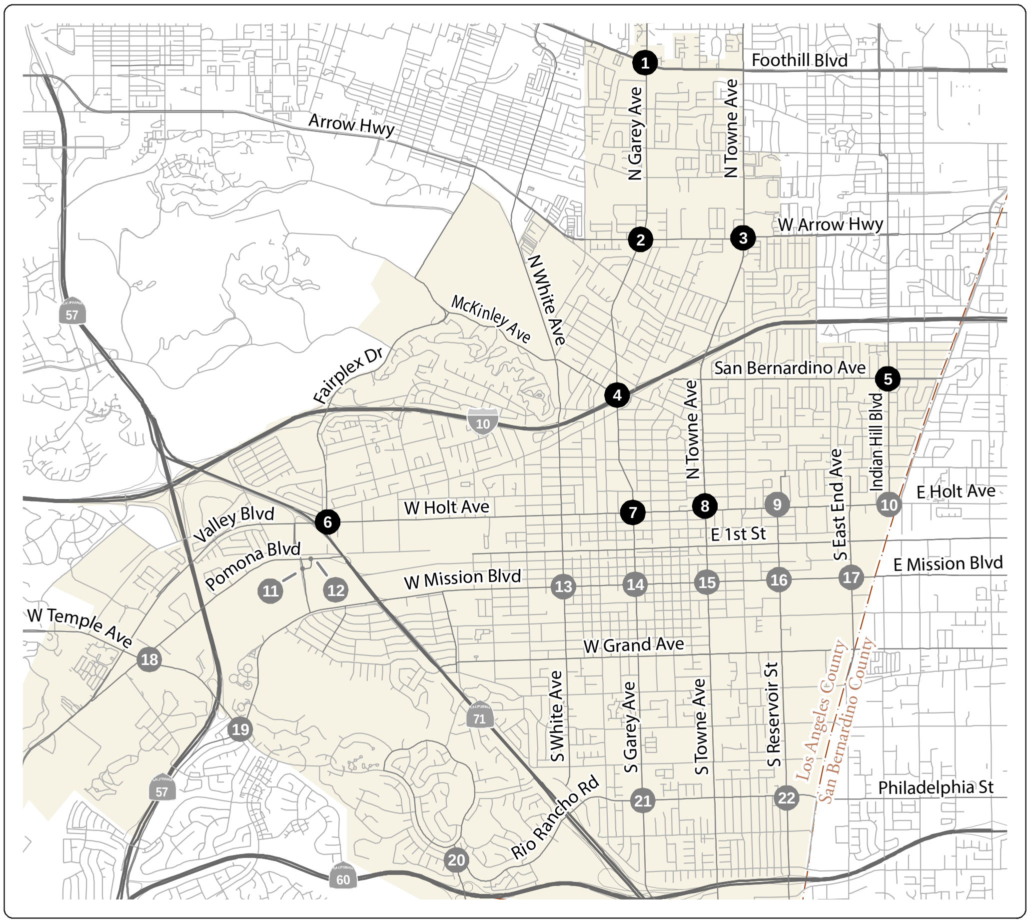
- Mission Boulevard - Mission Boulevard is classified as a major arterial street in the General Plan. It runs east to west and crosses both the SR-71 and SR-57 freeways. There are two lanes in either direction with a center turning lane. The posted speed limit is 35 MPH and on-street parking is allowed.
- Towne Avenue - Towne Avenue is identified as a major arterial in the City's General Plan. It runs north to south. There are two lanes in either direction with a center turning lane. On-street parking is allowed and the posted speed limit is 40 MPH.
- White Avenue - White Avenue runs north to south and is classified as a minor arterial street in the General Plan. There are three lanes in either direction and the roadway is divided by a raised median at certain sections. The posted speed limit is 35 MPH and on-street parking is sometimes allowed.
- Reservoir Street - The General Plan classifies Reservoir Street as a minor arterial which starts at Holt Avenue and goes south. There are two lanes in either direction, and a center turning lane. On street parking is generally prohibited and the posted speed limit is 40 MPH.
- East End Avenue - East End Avenue begins at Holt Avenue as a minor arterial street. As it extends south and crosses Mission Boulevard, the street's classification changes to major arterial. North of Mission Boulevard, the roadway has two lanes traveling in either direction; and a center turning lane. South of Mission Boulevard, the roadway changes to one lane in either direction. The posted speed limit is 40 MPH.
- San Bernardino Avenue - San Bernardino Avenue begins at Towne Avenue and runs east. It is classified as a minor arterial street in the City's General Plan. The roadway is two lanes in either direction with a center turning lane. On-street parking is generally allowed. The posted speed limit is 35 MPH.
- Indian Hill Boulevard - Indian Hill Boulevard runs north to south and ends at Holt Avenue. It is classified as a minor arterial street in the City's General Plan. The roadway has two lanes in either direction in addition to a center turning lane. On-street parking is not allowed. The posted speed limit is 40 MPH.

2.1.3 EXISTING OPERATIONS

Intersection Assessment

Existing AM and PM peak hour traffic volumes, traffic controls and intersection geometrics are summarized in Figure 2-1

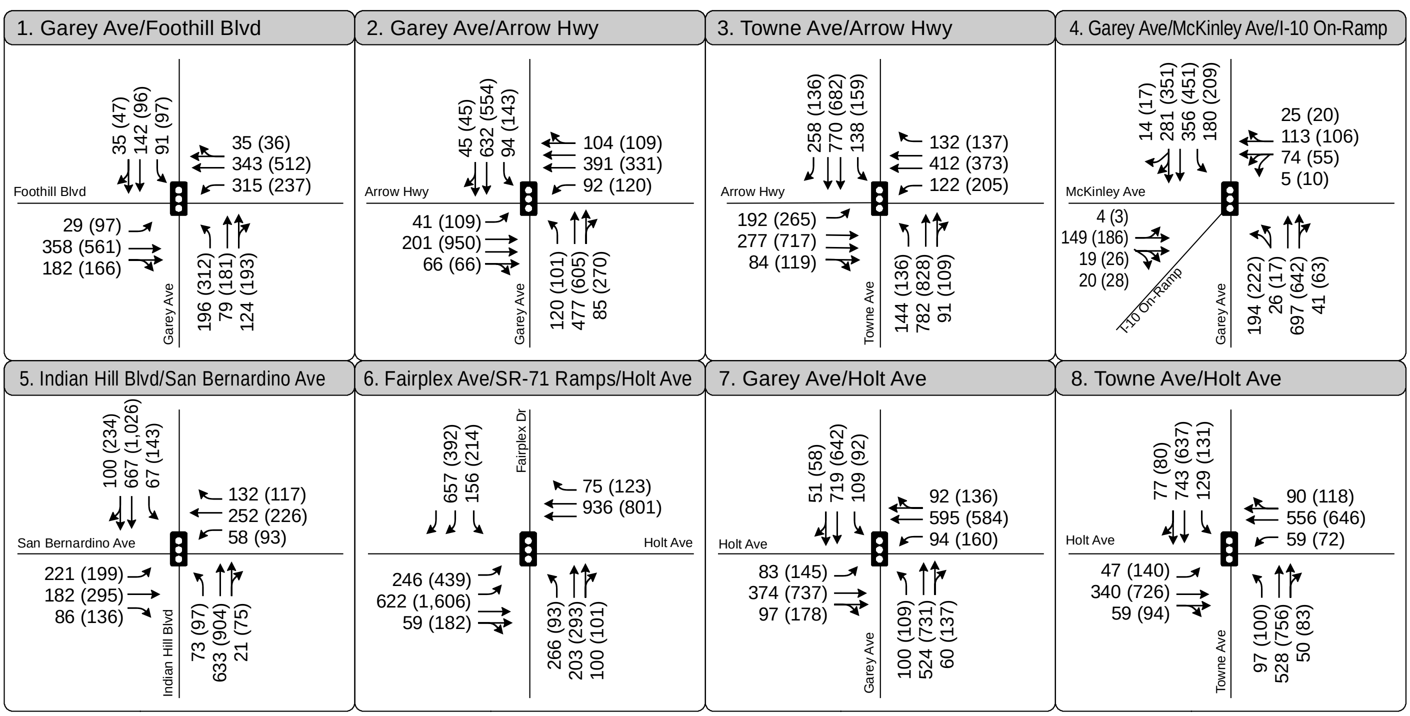
Existing traffic volumes described above, lane configurations collected in the field, and signal timing information provided by City staff were used to evaluate operations at the study intersections for existing AM and PM peak hour conditions. The results are summarized in Table 2-1.



LEGEND

	Turn Lane
AM (PM)	Peak Hour Traffic Volume
1	Study Intersection
1	Study Intersection (See Figures 2B/2C)
	Traffic Signal
	Stop Sign
	City of Pomona
	County Boundary

Not to Scale



PEAK HOUR TRAFFIC VOLUMES AND LANE CONFIGURATIONS - EXISTING CONDITIONS

FIGURE 2-1

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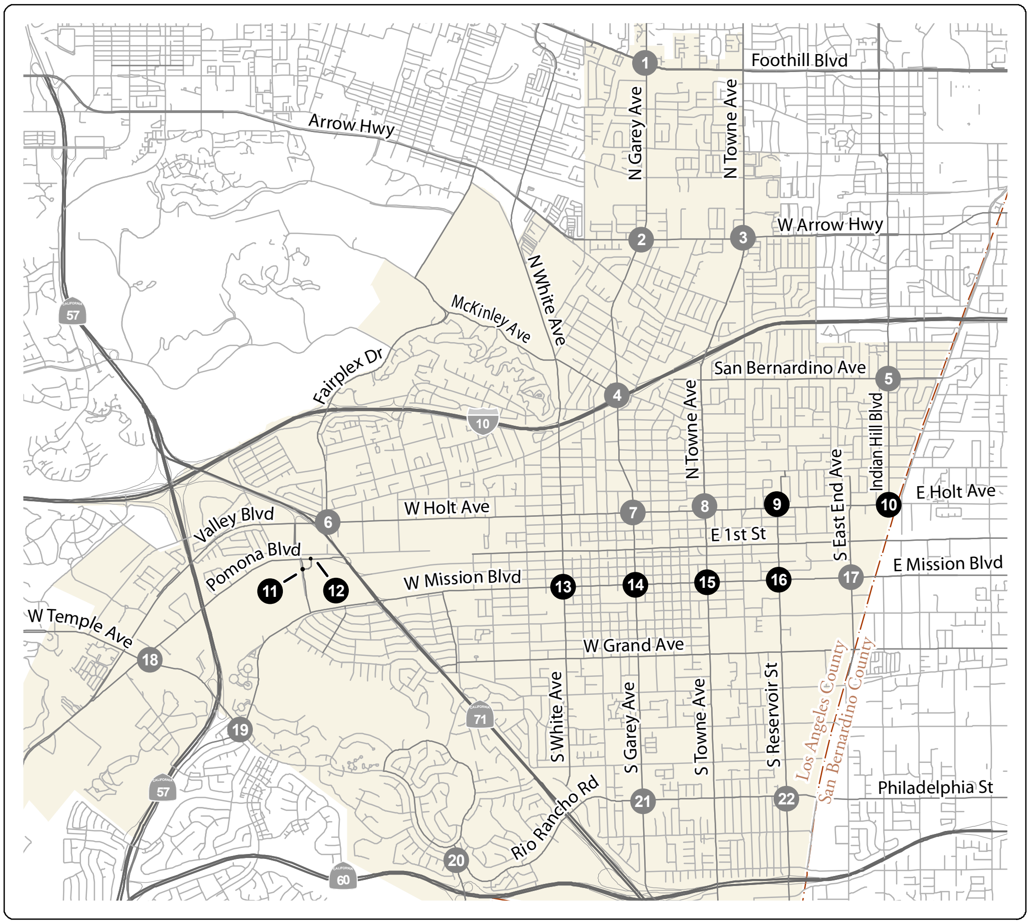
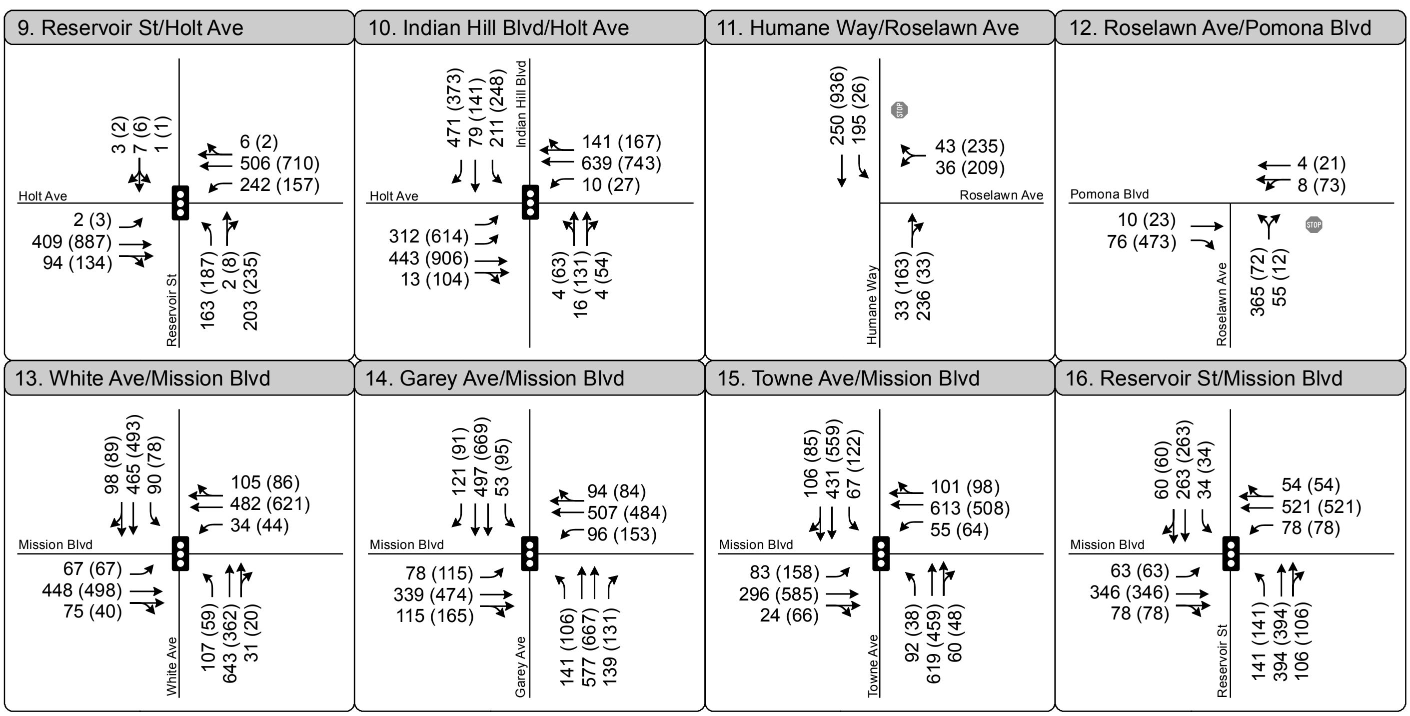


LEGEND

	Turn Lane
AM (PM)	Peak Hour Traffic Volume
1	Study Intersection
1	Study Intersection (See Figures 2A/2C)
	Traffic Signal
STOP	Stop Sign
	City of Pomona
	County Boundary

N

Not to Scale



FEHR & PEERS

PEAK HOUR TRAFFIC VOLUMES AND LANE CONFIGURATIONS - EXISTING CONDITIONS

FIGURE 2-1

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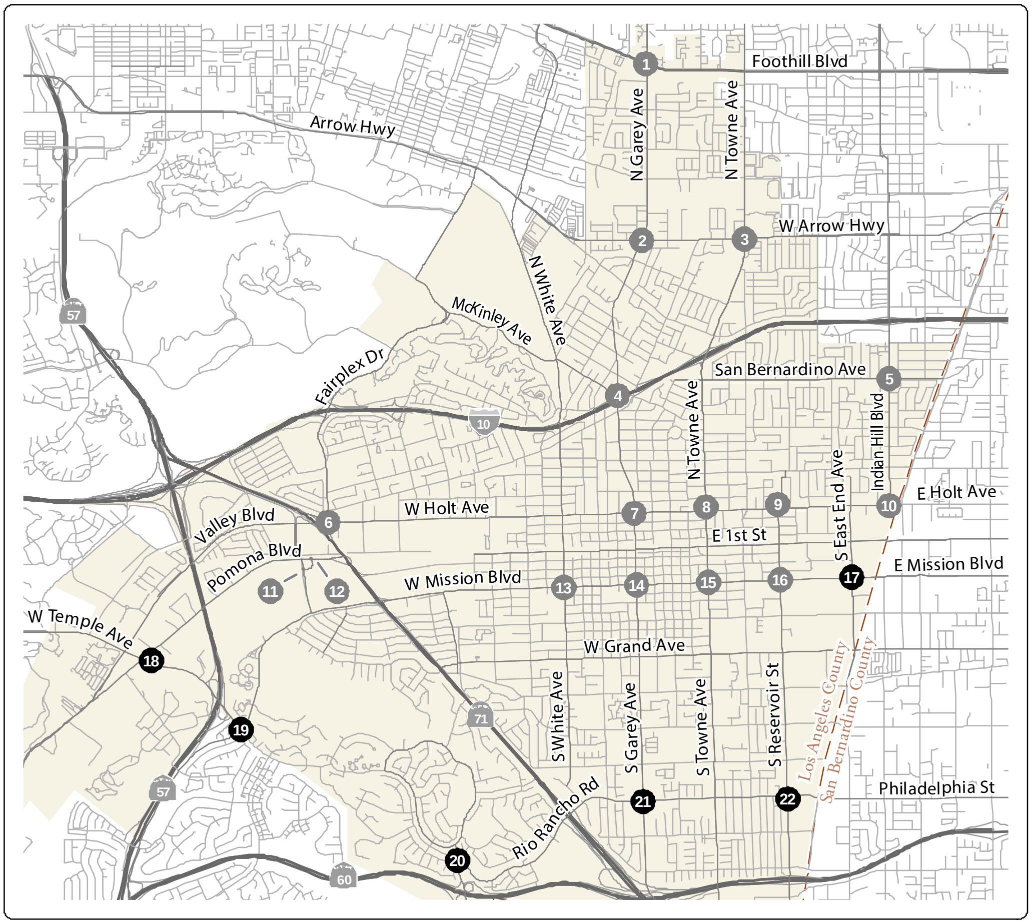
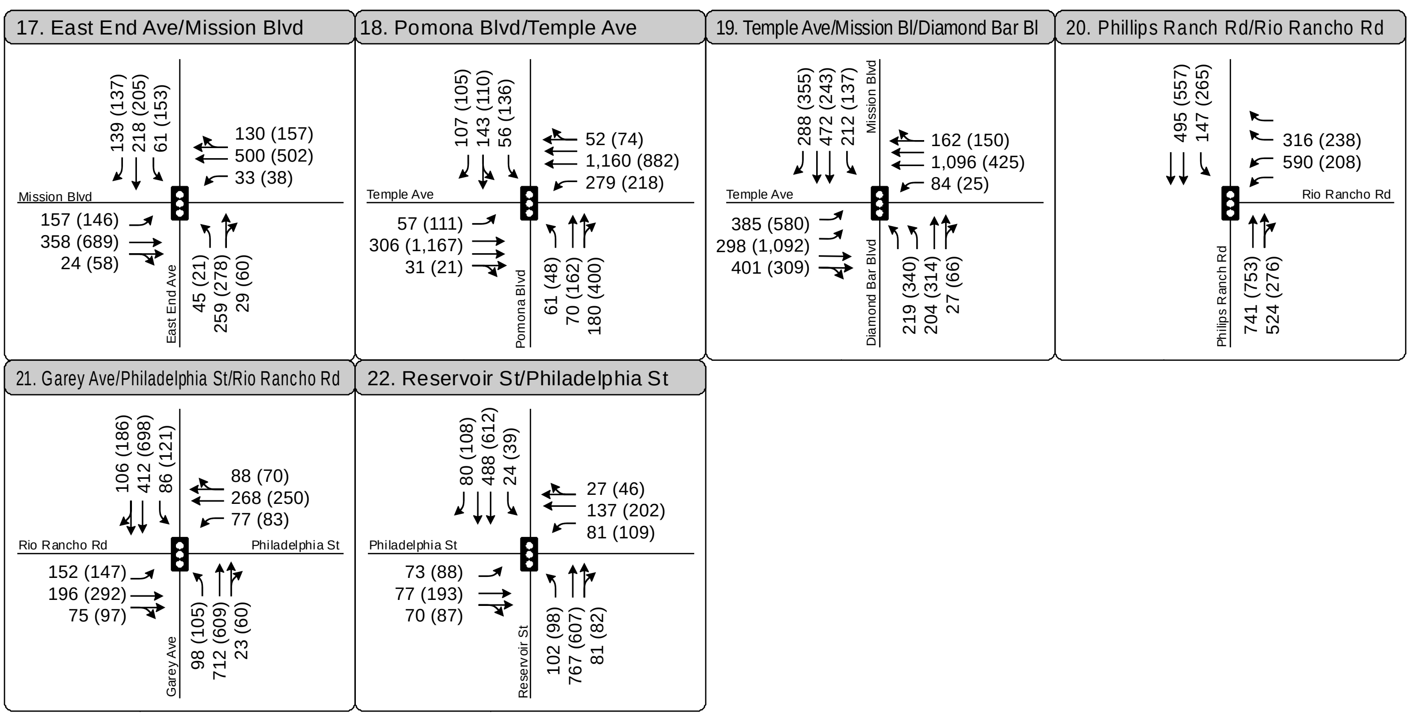


LEGEND

	Turn Lane
AM (PM)	Peak Hour Traffic Volume
	Study Intersection
	Study Intersection (See Figures 2A/2B)
	Traffic Signal
	Stop Sign
	City of Pomona
	County Boundary

N

Not to Scale



FEHR & PEERS

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PEAK HOUR TRAFFIC VOLUMES AND LANE CONFIGURATIONS - EXISTING CONDITIONS

FIGURE 2-1

TABLE 2-1 – INTERSECTION LEVEL OF SERVICE
EXISTING (2012) CONDITIONS

Intersection	Control	Place Type	AM Peak		PM Peak	
			Delay	LOS	Delay	LOS
1. Garey Ave & Foothill Blvd	Signal	CMP Roadway	29	C	39	D
2. Garey Ave & Arrow Hwy	Signal	CMP Roadway	33	C	50	D
3. Towne Ave & Arrow Hwy	Signal	CMP Roadway	54	D	62	E
4. Garey Ave & McKinley Ave & I-10	Signal	CMP Roadway	26	C	28	C
5. Indian Hill Blvd & San Bernardino Ave	Signal	Other Area	25	C	29	C
6. Fairplex Dr & Holt Ave	Signal	CMP Roadway	21	C	33	C
7. Garey Ave & Holt Ave	Signal	High Volume Corridor	41	D	48	D
8. Towne Ave & Holt Ave	Signal	High Volume Corridor	51	D	71	E
9. Reservoir St & Holt Ave	Signal	High Volume Corridor	31	C	34	C
10. Indian Hill Blvd & Holt Ave	Signal	High Volume Corridor	29	C	33	C
11. Humane Way & Roselawn Ave	Side-Street Stop	N/A	20	C	>90.0	F
12. Roselawn Ave & Pomona Blvd	Side-Street Stop	N/A	12	B	11	B
13. White Ave & Mission Blvd	Signal	Other Area	24	C	33	C
14. Garey Ave & Mission Blvd	Signal	Pedestrian-Oriented	31	C	34	C
15. Towne Ave & Mission Blvd	Signal	Other Area	19	B	19	B
16. Reservoir St & Mission Blvd	Signal	Other Area	20	B	28	C
17. East End Ave & Mission Blvd	Signal	Other Area	10	A	11	B
18. Pomona Blvd & West Temple Ave	Signal	Other Area	27	C	32	C
19. Mission Blvd & Temple Ave	Signal	Other Area	35	D	36	D
20. Phillips Ranch Rd & Rio Rancho Rd	Signal	Other Area	34	C	24	C
21. Garey Ave & Philadelphia St	Signal	High Volume Corridor	26	C	25	C
22. Reservoir St & Philadelphia St	Signal	Other Area	15	B	13	B

Notes:

1. Shaded cells indicate intersections operating below acceptable levels of service.

Source: Fehr & Peers, 2013

As shown in Table 2-1, the Humane Way at Roselawn Avenue intersection currently operates below the acceptable level of service during at the PM peak hour.

Roadway Segment Assessment

Existing ADT volumes were compared to the roadway segment daily LOS thresholds in Table 4-2 and are summarized in Table 2-2 below.

TABLE 2-2 – ANALYZED ROADWAY SEGMENT LOS

Roadway	Classification	Number of Lanes	Place Type	ADT	LOS
Village Loop Rd (Mill Valley Rd to North Ranch Rd)	Collector	2	Other	1,280	C or Better
Westmont Ave (Brea Canyon Rd to Buffington St)	Local Street	2	Other	3,578	C or Better
Humane Way (Roselawn Ave to Valley Blvd)	Minor Arterial	3	Other	9,782	C or Better

Source: Draft Pomona General Plan Update, 2013

Congestion Management Program Assessment

The *2010 Congestion Management Program for Los Angeles County* (Metropolitan Transportation Authority, adopted 2010) identifies specific requirements associated with CMP facilities. These requirements include evaluation of CMP-designated facilities using specific methodologies outlined in the CMP.

The level of service at the study CMP segments are summarized in the following tables. Table 2-3 summarizes the operations during the AM peak hour. Table 2-4 summarizes the operations of study CMP segments during the PM peak hour.

TABLE 2-3 – CMP FREEWAY SEGMENT ANALYSIS EXISTING CONDITIONS, AM PEAK HOUR

CMP Freeway Monitoring Location	City	Mainline Lanes[1]/Capacity[2]		Existing Conditions[3]					
				NB/EB			SB/WB		
		NB/EB	SB/WB	Demand	D/C Ratio	LOS	Demand	D/C Ratio	LOS
Interstate 10									
At Dudley St	Pomona	5/10,000	5/10,000	8,000	0.80	D	9,200	0.92	E
West of Indian Hill Blvd	Pomona	5/10,000	5/10,000	7,100	0.71	C	9,700	0.97	E
State Route 57									
South of Jct. Rtes 10/71/60	Pomona	5/10,000	5/10,000	6,200	0.62	B	6,100	0.61	B

Notes: 1. Number of existing freeway mainline lanes per direction
2. Capacity is based on assumed lane utilization of 2,000 passenger cars per lane per hour
3. Capacity, Demand, D/C Ratio and LOS are based on 2010 Congestion Management Program.
- D/C Ratio = demand-to-capacity ratio
- LOS = level of service

Source: 2010 Congestion Management Program for Los Angeles County, Metropolitan Transportation Authority, 2010.

TABLE 2-4 – CMP FREEWAY SEGMENT ANALYSIS EXISTING CONDITIONS, PM PEAK HOUR

CMP Freeway Monitoring Location	City	No. of Mainline Lanes[1]/Capacity[2]		Existing Conditions[3]					
				NB/EB			SB/WB		
		NB/EB	SB/WB	Demand	D/C Ratio	LOS	Demand	D/C Ratio	LOS
Interstate 10									
At Dudley St	Pomona	5/10,000	5/10,000	10,200	1.02	F(0)	8,400	0.84	D
West of Indian Hill Blvd	Pomona	5/10,000	5/10,000	8,700	0.87	D	8,300	0.83	D
State Route 57									
South of Jct. Rtes 10/71/60	Pomona	5/10,000	5/10,000	6,000	0.60	A	6,200	0.62	B

Notes: 1. Number of existing freeway mainline lanes per direction
2. Capacity is based on assumed lane utilization of 2,000 passenger cars per lane per hour
3. Capacity, Demand, D/C Ratio and LOS are based on 2010 Congestion Management Program.
- D/C Ratio = demand-to-capacity ratio
- LOS = level of service

Source: 2010 Congestion Management Program for Los Angeles County, Metropolitan Transportation Authority, 2010.

As shown in Table 2-4, one CMP freeway monitoring location currently operates below the acceptable level of service during the PM peak hour.

- I-10 at Dudley St – LOS F in the PM peak hour

Table 2-5 summarizes the arterial CMP facilities, Foothill Boulevard and Arrow Highway.

TABLE 2-5 – CMP ARTERIAL ANALYSIS EXISTING CONDITIONS

Responsible Agency	CMP Route	Cross Street	AM		PM	
			V/C	LOS	V/C	LOS
Pomona	Arrow Hwy	Garey Ave	0.52	A	0.58	A
Pomona	Foothill Blvd	Garey Ave	0.57	A	0.59	A

Source: 2010 Congestion Management Program for Los Angeles County, Metropolitan Transportation Authority, 2010.

As shown in Table 2-5, both CMP arterial monitoring locations operate at acceptable levels of service during both peak hours.

2.2 EXISTING TRANSIT FACILITIES

The study area is well serviced by public transportation. Foothill Transit, Omnitrans, and Los Angeles county MTA buses all operate within the City. In addition, there are two Metrolink commuter rail stations, one of which also serves as an Amtrak station. The Cal Poly Pomona Campus is a major destination within the City and offers a shuttle service, the “Bronco Shuttle,” to provide connections between major destinations within the campus and the City. The services are described below:

2.2.1 BUS SERVICE

Three transit operators provide bus service on a number of routes within the City.

- Foothill Transit—Foothill Transit provides the most extensive bus service and most bus lines serve Downtown and the Downtown Pomona Transit Center. Several bus routes provide frequent service, with the time between bus arrivals (headways) resulting in frequencies of 10-15 minutes during peak hours.
- Omnitrans—Omnitrans operates one bus route within the City, traveling down Holt Avenue to the Downtown Pomona Transit Center with service every 15 minutes.
- Los Angeles County Metropolitan Transportation Authority (MTA)—MTA operates two bus routes within Pomona. Line 484 provides service connecting Downtown Pomona and Cal Poly with Downtown Los Angeles, Union Station, and Cal State Los Angeles with peak headways of 10-15 minutes. Line 490 provides service connecting the Lanterman Development Center with Downtown Los Angeles, Union Station, Mount San Antonio College, and Cal State Los Angeles. Peak headways are approximately every 20 minutes.

2.2.2 RAIL SERVICE

- Downtown Station—Metrolink’s Riverside line serves the Downtown Pomona Station, with destinations between Downtown Los Angeles and Riverside. Six trains stop in Pomona daily with trains arriving every 30 minutes during the peak hour and peak direction.
- North Pomona Station—Metrolink’s San Bernardino line serves the North Pomona Station, providing both weekday and weekend service, with destinations between Downtown Los Angeles and Downtown San Bernardino. During weekdays, trains arrive every 30 minutes in peak hour and peak direction.

2.2.3 POMONA CAMPUS SHUTTLE

The Bronco Express shuttle operates four routes on the Cal Poly Pomona campus. Campus shuttle routes cover most of the major on-campus roadways and Camphor Lane, Kellogg West Drive, and Lots K and B. The campus shuttle operates from Monday to Friday with a frequency of 10-15 minutes and varying operating hours depending on the route.

Cal Poly Pomona has enhanced bus stop amenities at several of its transit stops. The amenities include decorative bus shelters, benches, and trash cans. In addition, Cal Poly Pomona has implemented a special system which informs transit patrons of the real-time location and waiting time of the Bronco Express buses. Digital signs at four prominent stops on campus have the bus arrival information. A website compliments the bus stop amenities by displaying arrival times at all 32 bus stops on-campus as well as including a map showing real-time bus locations and arrival times.

The Bronco Link Shuttle service also carries Cal Poly related passengers between the main campus and the Pomona North Station. The service includes two stops on campus and runs twice in the morning and twice in the evening. According to the University, the Bronco Shuttle Link is significantly quicker than the existing local transit lines, as the Shuttle does not stop between the transit stations and Cal Poly Pomona. The Bronco Link Shuttle is a free service for students, faculty, and staff.

Figure 2-2 shows the transit services which travel through the City.

2.3 EXISTING BICYCLE AND PEDESTRIAN NETWORK

Pomona has a grid-based network of streets that provide excellent opportunities to develop a bikeway system. An inventory was completed of existing multi-use paths and on-street bikeway facilities based on the City's data files, project documents provided by City staff, information from the general public, and extensive field visits.

These bikeways include three distinct types of facilities:

- Class I Shared-Use Paths—these facilities provide a completely separate right-of-way and are designated for the exclusive use of bicycles and pedestrians with vehicle cross-flow minimized.
- Class II Bike Lanes—these facilities provide a restricted right-of-way and are designated for the use of bicycles with a striped lane on a street or highway.
- Class III Bike Routes—these facilities provide a right-of-way designated by signs or pavement markings for shared uses with pedestrians or motor vehicles. .

The City currently has approximately 3.28 miles of bikeway facilities, consisting of approximately 2.1 miles of Class I multi-use paths, 1.27 miles of Class II bike lanes, and no miles of Class III bike routes

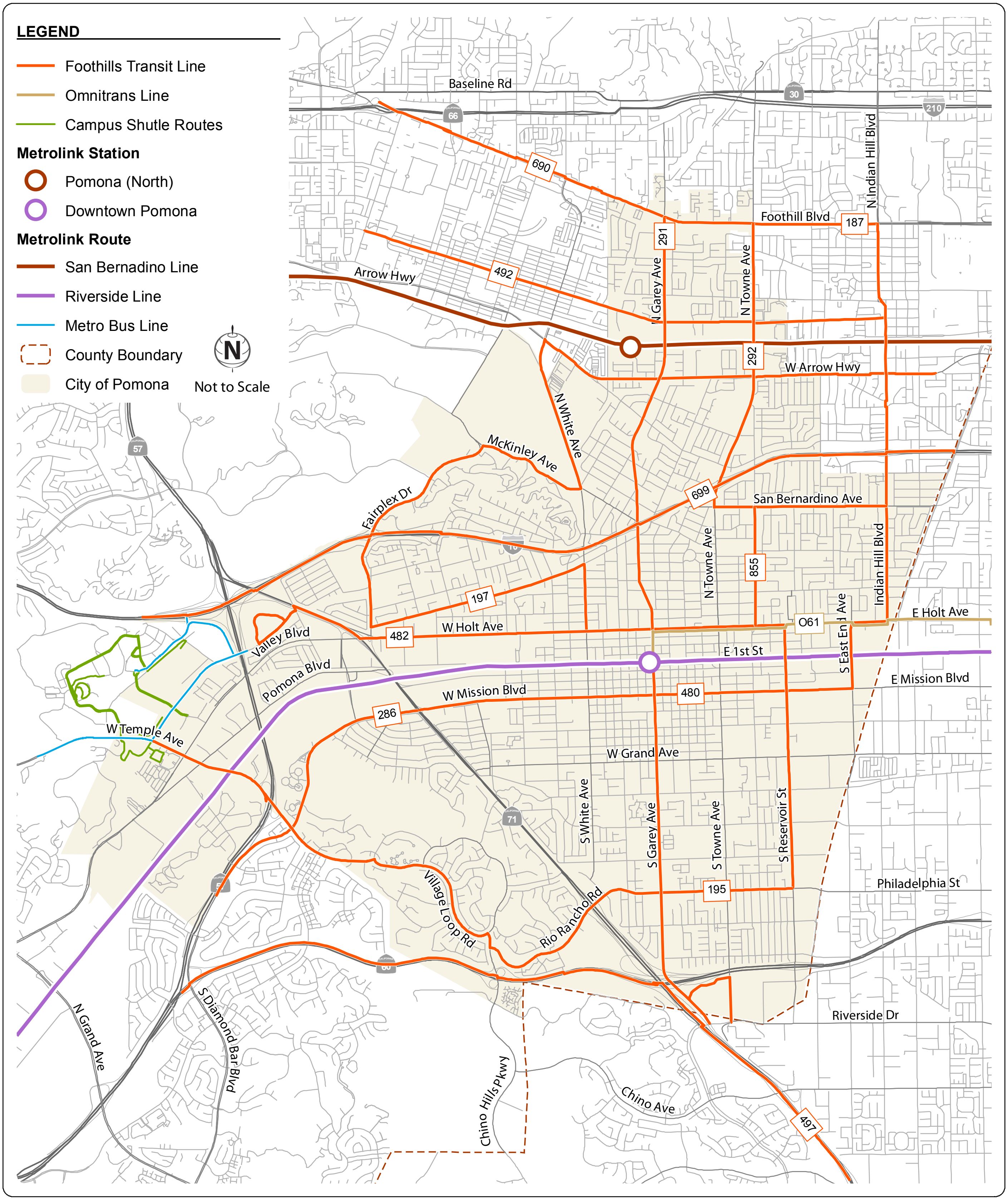
Bicycle parking is present at Pomona's two Metrolink stations, the Pomona Civic Center, and major educational institutions such as Cal Poly Pomona, while limited bicycle parking is present throughout the rest of the City. The City does not currently have a rack placement or rack request program enabling accurate tracking or geographic locating of city-installed racks in the public right-of-way or on other publicly-owned properties.

The 2012 Los Angeles County Bicycle Master Plan proposes two major regional Class I facilities that would pass through the City of Pomona: the Thompson Creek Path, which would travel north-south through the northwestern corner of the City, and the San Jose Creek Trail, which would travel north-south through the western part of the City.

The Citrus Regional Bikeway, which is the Los Angeles County continuation of San Bernardino County's Pacific Electric Trail, would travel through north Pomona parallel to the Metrolink rail tracks, connecting to surface streets in Claremont at its eastern end, continuing west through La Verne and eventually connecting to the San Gabriel River Trail.

Pedestrian facilities throughout the City of Pomona are well developed along most major roadways, and the City has an extensive trail network. However, particularly outside of the central district, gaps in the sidewalk network, long crossing distances on wide arterial roadways, lack of marked crosswalks, and longer blocks with lack of street connectivity often make walking difficult.

Figure 2-3 shows the existing bicycle facilities within Pomona.



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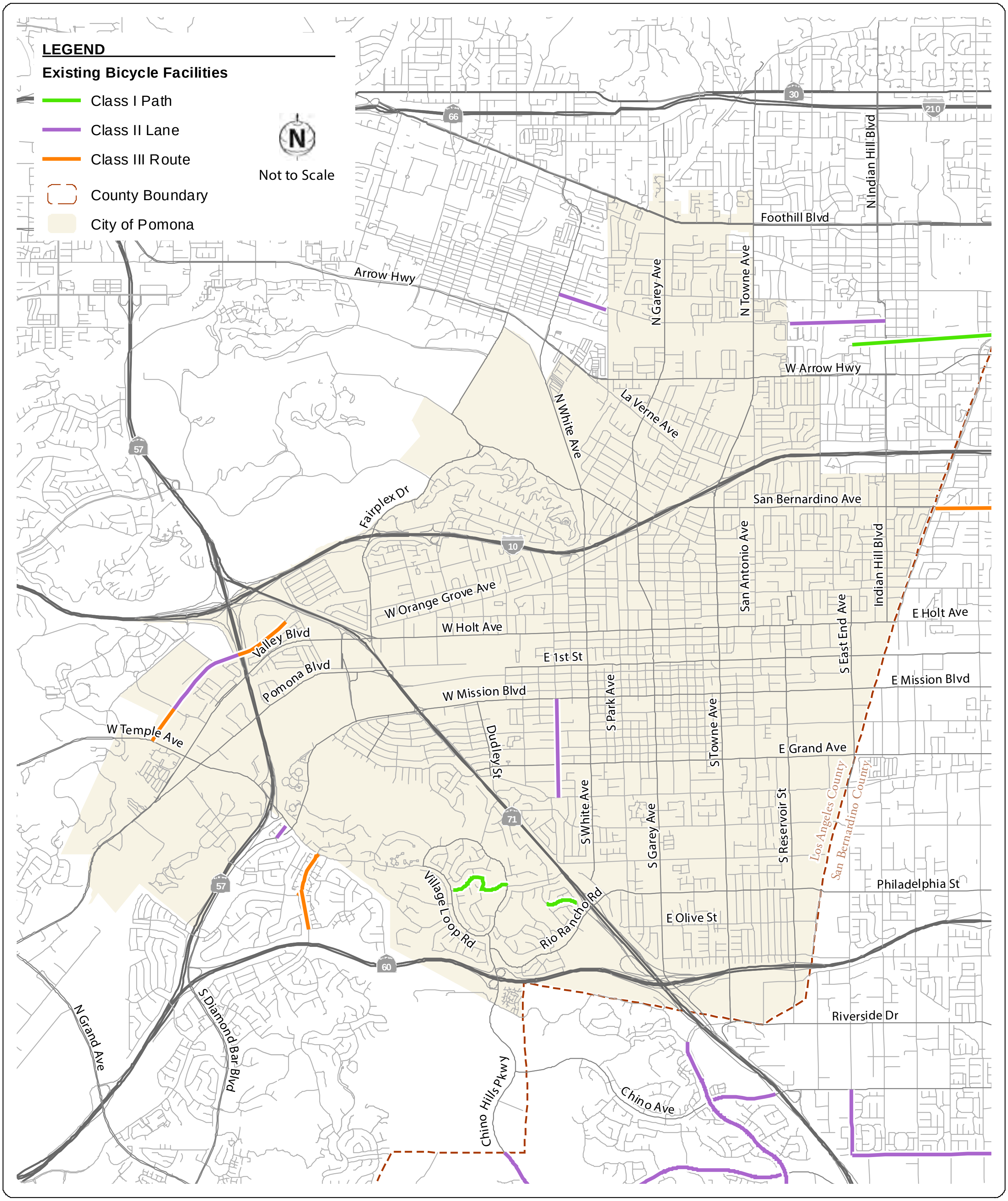
EXISTING TRANSIT FACILITIES

FIGURE 2-2



FEHR & PEERS

EXISTING BICYCLE FACILITIES

FIGURE 2-3

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3.0 FUTURE CONDITION (2035)

For General Plan assessment, the Future Condition represents the basis for the impact determination. Specifically, the analysis scenario represents the "with project" conditions under buildout of the City's General Plan, Corridors Specific Plan, Active Transportation Plan, and incorporates projected growth associated with the SCAG Regional Transportation Plan (RTP) / Sustainable Communities Strategy (SCS). For purposes of this assessment, the Future Condition generally corresponds to a Year 2035 development horizon outside of the City limits and land use / transportation facilities consistent with the City's planning efforts.

3.1 Traffic Volumes

To develop traffic volumes for this assessment, Fehr & Peers developed the Pomona Traffic Analysis Model (PTAM). PTAM utilizes the TransCAD travel demand forecasting software and is a traditional three-step travel demand model – (1) trip generation, (2) trip distribution, and (3) trip assignment.

The model began with the SCAG regional 2012 RTP travel demand forecasting model. The roadway network and land use information (traffic analysis zones (TAZs) and land use) from the regional model was extracted and incorporated into the stand-alone PTAM model. Existing land use was updated to reflect better land use information than the SCAG TAZ land use information and included updating location of schools, updating school enrollment information, and verifying employment and population information to census and other available land use data. Additionally, the roadway network was improved to incorporate network information that was not incorporated into the SCAG model and to fix some network coding anomalies in the SCAG model.

3.1.1 BASE YEAR MODEL INFORMATION

Trip Generation

Trip generation for the PTAM model was developed using rates by land use category consistent with ITE, NCHRP (National Cooperative Highway Research Program), and other local trip rate sources. These rates were also verified to be consistent with SCAG model trip rates by reviewing trips loading onto the roadway system from TAZs that had homogenous land use information. The base year PTAM model sufficiently satisfied all state and federal model validation guidelines (model validation results are presented in the appendix), further evidence that the trip rate information is appropriate for the City of Pomona.

Trip Distribution

This component of the model was developed by establishing friction factor curves by trip purpose. Friction factor curves effectively identify the average travel distance based on the type of trip that occurs. These curves were calibrated to existing trip length information within the SCAG region and using Caltrans travel survey information for the City of Pomona. For trips that are not internal to the City (e.g. trips that pass through the City or trips that have only one trip end within the City), Fehr & Peers utilized the SCAG 2012 RTP model to estimate those trip interactions.

Trip Assignment

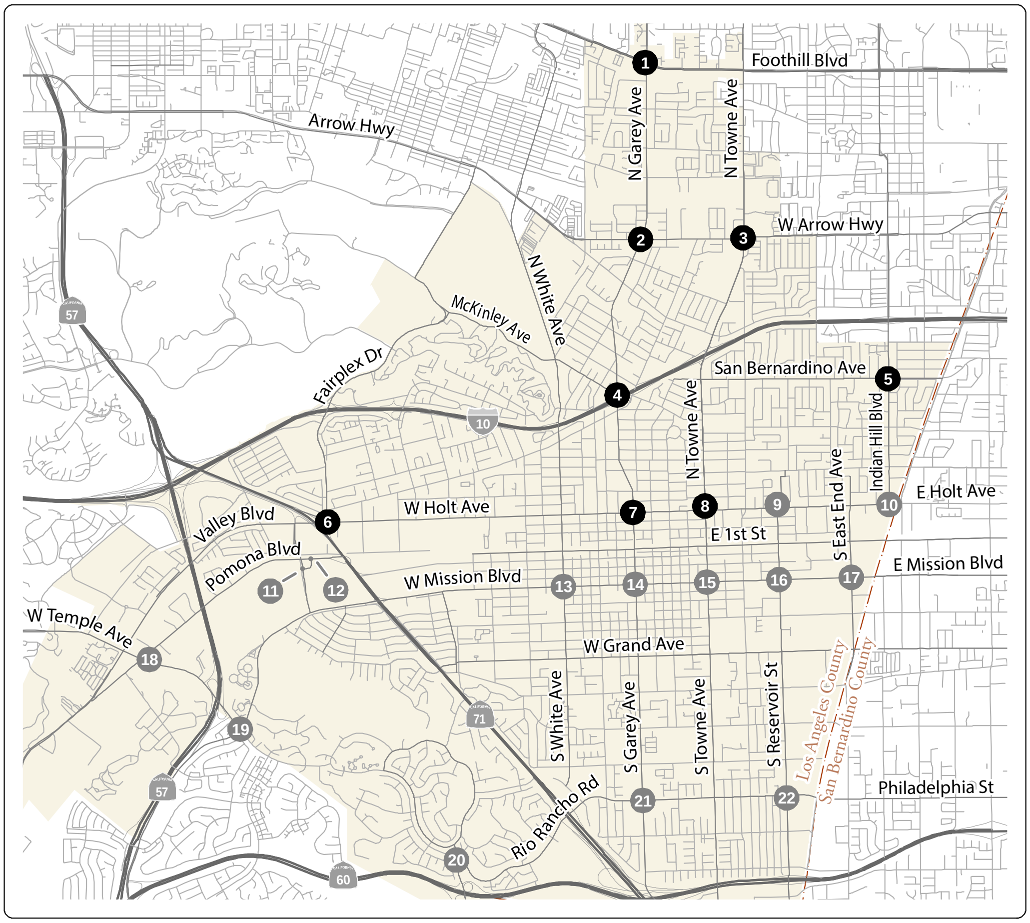
The model assigns trips to the roadway system using the trip generation and distribution information described above. The model assigns trips to the shortest path, but it also identifies roadway congestion in the area and reassigns traffic to other routes that have a travel time savings due to less congestion on those facilities. The model runs through a series of assignment iterations until it reaches a "convergence" point, where assignment is generally balanced between the origins and destinations and vehicle route choice is using the most time-efficient routes.

As discussed in the trip assignment section above, the validation results are further evidence that the trip distribution function and the trip assignment functions are working correctly and are replicating travel behavior within the City.

3.1.2 FUTURE YEAR MODEL INFROMATION

The model was utilized to evaluate the transportation system by incorporating the future land use and roadway network information into the future year model. Future land use information was provided to Fehr & Peers from Rincon and incorporates the General Plan land use projections, the Corridors Specific Plan land use projections, Mount Sac and Cal Poly Pomona land use projections from their Master Plans, and SCAG RTP/SCS land use projections outside of the City limits.

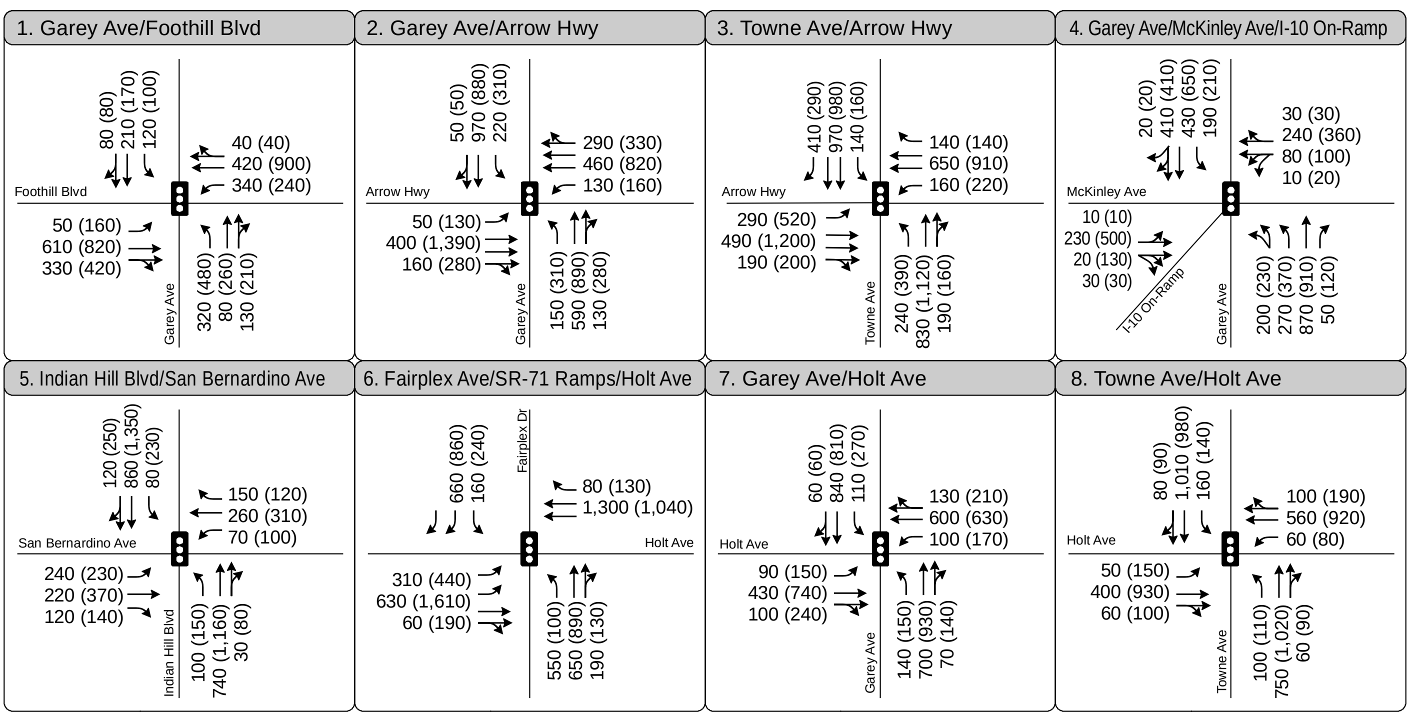
The roadway network inside the City was updated to reflect the proposed changes consistent with the Circulation Element, the Active Transportation Plan, and Tier 1 Funded RTP improvements from the 2012 SCAG RTP. Future traffic growth passing through the City was estimated directly from the SCAG 2012 RTP model. The Future Year Traffic Volumes and lane configurations are shown on Figure 3-1.



LEGEND

- Turn Lane
- AM (PM) Peak Hour Traffic Volume
- 1 Study Intersection
- 1 Study Intersection (See Figures 4-1B/4-1C)
- Traffic Signal
- Stop Sign
- City of Pomona
- County Boundary

Not to Scale



FEHR & PEERS

PEAK HOUR TRAFFIC VOLUMES AND LANE CONFIGURATIONS - FUTURE YEAR 2035 CONDITIONS

FIGURE 3-1

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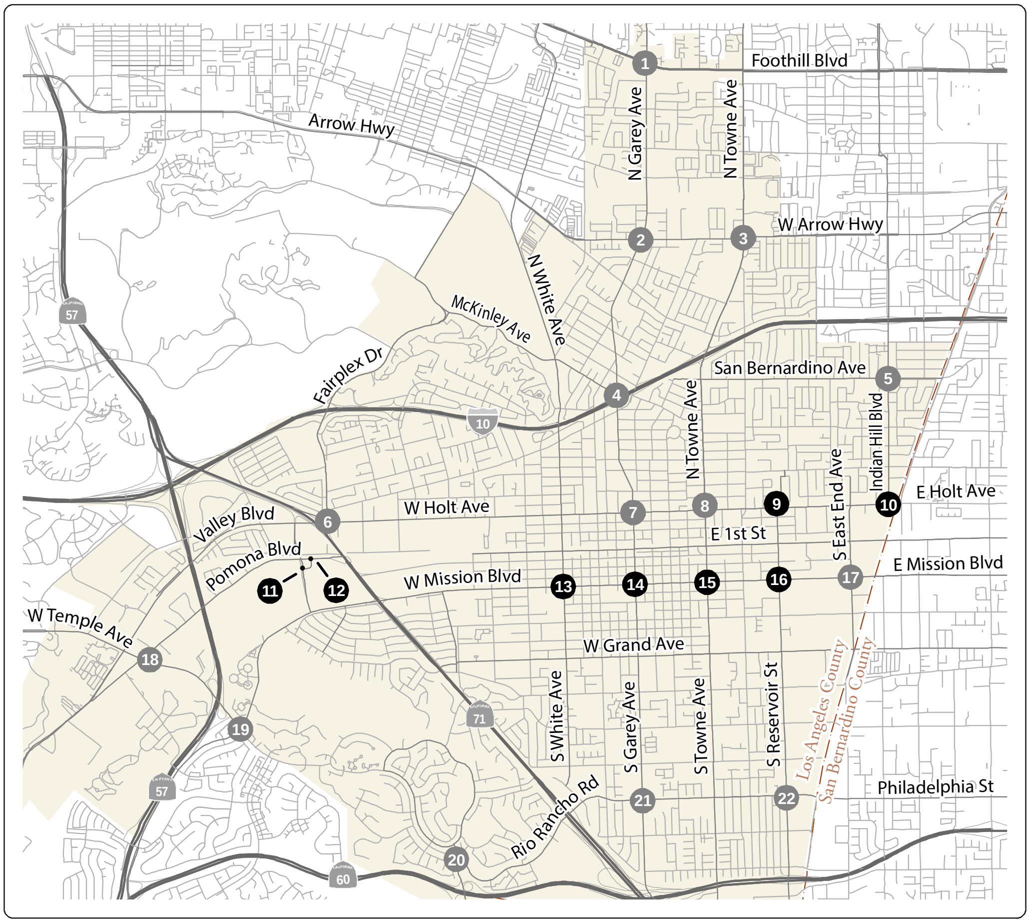


LEGEND

Turn Lane

AM (PM) Peak Hour Traffic Volume

Study Intersection

Study Intersection (See Figures 4-1A/4-1C)

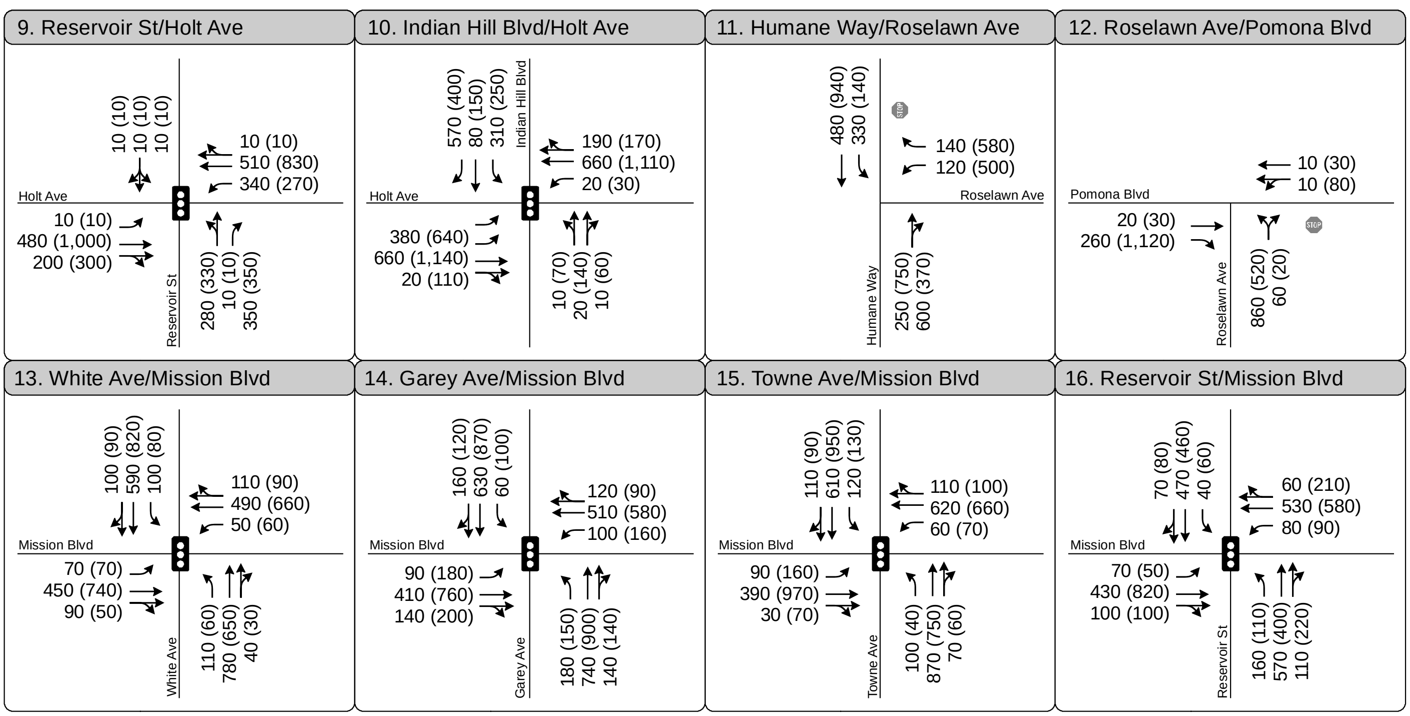
Traffic Signal

Stop Sign

City of Pomona

County Boundary

Not to Scale



FEHR & PEERS

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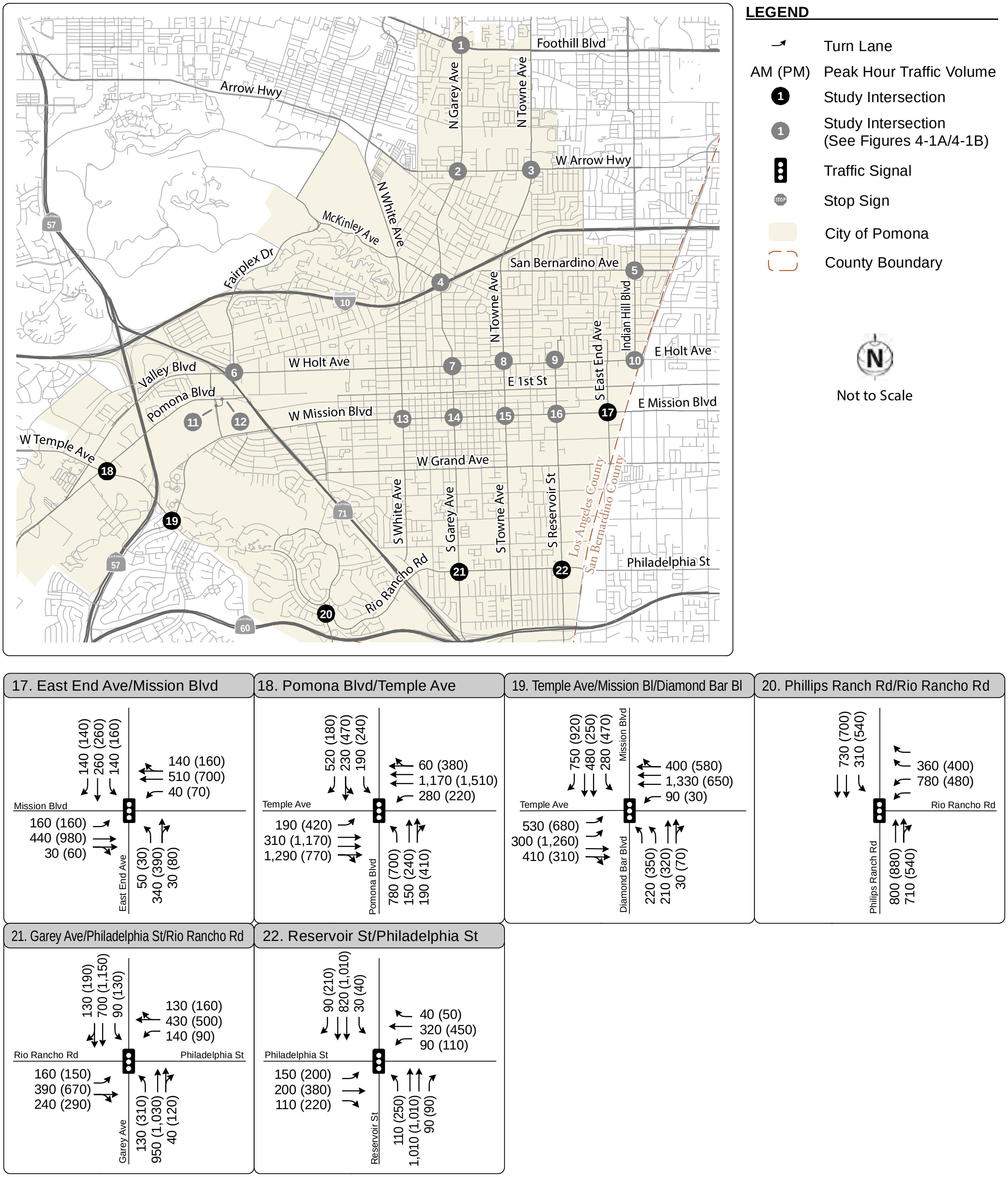
PEAK HOUR TRAFFIC VOLUMES AND LANE CONFIGURATIONS - FUTURE YEAR 2035 CONDITIONS

FIGURE 3-1



FEHR & PEERS

PEAK HOUR TRAFFIC VOLUMES AND LANE CONFIGURATIONS - FUTURE YEAR 2035 CONDITIONS

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FIGURE 3-1

3.2 FUTURE ROADWAY FACILITIES

The information identified above was incorporated into the level of service assessment for the study facilities under the Future (2035) Condition. The information is summarized below:

3.2.1 INTERSECTION OPERATIONS

The future roadway network lane configurations and traffic volumes were incorporated into the level of service analysis to evaluate future intersection operations. The results are summarized in Table 3-1.

As shown in Table 3-1, the following intersections are expected to operate unacceptably with the current lane configurations identified as part of the proposed plans:

- Garey Avenue / Arrow Highway
- Towne Avenue / Arrow Highway
- Garey Avenue / McKinley Ave & I-10
- Fairplex Drive / Holt Avenue / SR-71 Freeway Ramps
- Humane Way / Roselawn Avenue
- Roselawn Avenue / Pomona Avenue
- Mission Boulevard / Temple Avenue
- Phillips Ranch Road / Rio Rancho Road
- Garey Avenue / Philadelphia Street

Measures to improve these facilities are described in Chapter 6.

Roadway Segment Assessment

Existing ADT volumes were compared to the roadway segment daily LOS thresholds in Table 4-2 and are summarized in Table 3-2 below. The roadway segment assessment shows that all three roadways will operate at an acceptable level of service. However, LOS does not completely describe the story related to traffic volumes in this area. The specifics about each of these roadways, and how traffic changes on them, are described in further detail below:

- Village Loop Road (Mill Valley Road to North Ranch Road) – Traffic volumes significantly reduce on this segment by approximately 1,000 ADT. This is primarily due to the North Ranch Road and Old Pomona Road connections to SR 71 (that currently exists) being eliminated with the SR 71 freeway project.
- Westmont Avenue (Brea Canyon Road to Buffington Street) – Traffic volumes are projected to substantially increase on this roadway segment (more than double). This is anticipated due to the West Phillips Drive Connection to SR 71 being removed with the freeway project which will force the majority of the traffic generated in the neighborhood to utilize this access point. This is a

substantial increase in traffic on a street generally serving households, a major impact to that neighborhood. Measures to address this are described in Chapter 6.

TABLE 3-1 – INTERSECTION LEVEL OF SERVICE
FUTURE (2035) CONDITIONS

Intersection	Control	Place Type	AM Peak		PM Peak	
			Delay	LOS	Delay	LOS
1. Garey Ave & Foothill Blvd	Signal	CMP Roadway	61	E	59	E
2. Garey Ave & Arrow Hwy	Signal	CMP Roadway	50	D	> 90	F
3. Towne Ave & Arrow Hwy	Signal	CMP Roadway	50	D	> 90	F
4. Garey Ave & McKinley Ave & I-10	Signal	CMP Roadway	65	E	> 90	F
5. Indian Hill Blvd & San Bernardino Ave	Signal	Other Area	32	C	59	E
6. Fairplex Dr & Holt Ave	Signal	CMP Roadway	52	D	>90	F
7. Garey Ave & Holt Ave	Signal	High Volume Corridor	33	C	56	E
8. Towne Ave & Holt Ave	Signal	High Volume Corridor	31	C	57	E
9. Reservoir St & Holt Ave	Signal	High Volume Corridor	22	C	73	E
10. Indian Hill Blvd & Holt Ave	Signal	High Volume Corridor	25	C	43	D
11. Humane Way & Roselawn Ave	Side-Street Stop	N/A	> 90	F	> 90	F
12. Roselawn Ave & Pomona Blvd	Side-Street Stop	N/A	54	F	37	E
13. White Ave & Mission Blvd	Signal	Other Area	20	C	30	C
14. Garey Ave & Mission Blvd	Signal	Pedestrian-Oriented	30	C	52	D
15. Towne Ave & Mission Blvd	Signal	Other Area	12	B	22	C
16. Reservoir St & Mission Blvd	Signal	Other Area	10	B	32	C
17. East End Ave & Mission Blvd	Signal	Other Area	14	B	18	B
18. Pomona Blvd & West Temple Ave	Signal	Other Area	> 90	F	> 90	F
19. Mission Blvd & Temple Ave	Signal	Other Area	> 90	F	> 90	F
20. Phillips Ranch Rd & Rio Rancho Rd	Signal	Other Area	63	E	88	F
21. Garey Ave & Philadelphia St	Signal	High Volume Corridor	45	D	> 90	F
22. Reservoir St & Philadelphia St	Signal	Other Area	20	C	36	D

Notes:

1. Shaded cells indicate intersections operating below acceptable levels of service.

Source: Fehr & Peers, 2013

TABLE 3-2 – ANALYZED ROADWAY SEGMENT LOS							
Roadway	Classification	Number of Lanes	Place Type	Existing		Future	
				ADT	LOS	ADT	LOS
Village Loop Rd (Mill Valley Rd to North Ranch Rd)	Collector	2	Other	1,280	C or Better	260	C or Better
Westmont Ave (Brea Canyon Rd to Buffington St)	Local Street	2	Other	3,578	C or Better	7,600	C or Better
Humane Way (Roselawn Ave to Valley Blvd)	Minor Arterial	3	Other	9,782	C or Better	21,800	D
Source: Draft Pomona General Plan Update, 2013							

- Humane Way (Roselawn Avenue to Valley Boulevard) – Traffic volumes on this segment are expected to increase substantially (more than double). This is primarily due to the amount of development anticipated to west on Pomona Boulevard (such as the Lanterman area) and the reduced accessibility to SR-71. Please note, this facility will continue to operate acceptably as a 3-lane facility.

Congestion Management Program Assessment

The *2010 Congestion Management Program for Los Angeles County* (Metropolitan Transportation Authority, adopted 2010) identifies specific requirements associated with CMP facilities. These requirements include evaluation of CMP-designated facilities using specific methodologies outlined in the CMP.

The level of service at the study CMP segments are summarized in the following tables. Table 3-3 summarizes the operations during the AM peak hour. Table 3-4 summarizes the operations of study CMP segments during the PM peak hour.

The results indicate that two CMP freeway segments will operate at an unacceptable LOS F:

- I-10, West of Indian Hill Boulevard (AM Peak Hour) – Buildout of the plans and regional growth will degrade operations to LOS F.
- I-10, At Dudley (PM Peak Hour) - Buildout of the plans and regional growth will degrade operations to LOS F.

TABLE 3-3 – CMP FREEWAY SEGMENT ANALYSIS FUTURE CONDITIONS, AM PEAK HOUR

CMP Freeway Monitoring Location	City	Mainline Lanes[1]/Capacity[2]		Future Conditions[3]					
				NB/EB			SB/WB		
		NB/EB	SB/WB	Demand	D/C Ratio	LOS	Demand	D/C Ratio	LOS
Interstate 10									
At Dudley St	Pomona	5/10,000	5/10,000	9,000	0.90	E	9,600	0.96	E
West of Indian Hill Blvd	Pomona	5/10,000	5/10,000	8,400	0.84	D	10,000	1.00	F(0)
State Route 57									
South of Jct. Rtes 10/71/60	Pomona	5/10,000	5/10,000	7,000	0.70	C	8,100	0.81	D

Notes: 1. Number of existing freeway mainline lanes per direction
2. Capacity is based on assumed lane utilization of 2,000 passenger cars per lane per hour
3. Capacity, Demand, D/C Ratio and LOS are based on 2010 Congestion Management Program.
- D/C Ratio = demand-to-capacity ratio
- LOS = level of service
- Shaded cells indicate unacceptable operations.

Source: 2010 Congestion Management Program for Los Angeles County, Metropolitan Transportation Authority, 2010.

TABLE 3-4 – CMP FREEWAY SEGMENT ANALYSIS FUTURE CONDITIONS, PM PEAK HOUR									
CMP Freeway Monitoring Location	City	No. of Mainline Lanes[1]/Capacity[2]		Future Conditions[3]					
				NB/EB			SB/WB		
		NB/EB	SB/WB	Demand	D/C Ratio	LOS	Demand	D/C Ratio	LOS
Interstate 10									
At Dudley St	Pomona	5/10,000	5/10,000	10,400	1.04	F(0)	9,400	0.94	E
West of Indian Hill Blvd	Pomona	5/10,000	5/10,000	9,000	0.90	E	9,000	0.90	E
State Route 57									
South of Jct. Rtes 10/71/60	Pomona	5/10,000	5/10,000	6,500	0.65	B	7,800	0.78	C

Notes: 1. Number of existing freeway mainline lanes per direction
2. Capacity is based on assumed lane utilization of 2,000 passenger cars per lane per hour
3. Capacity, Demand, D/C Ratio and LOS are based on 2010 Congestion Management Program.
- D/C Ratio = demand-to-capacity ratio
- LOS = level of service
- Shaded cells indicate unacceptable operations.

Source: 2010 Congestion Management Program for Los Angeles County, Metropolitan Transportation Authority, 2010.

Table 3-5 summarizes the arterial CMP facilities, Foothill Boulevard and Arrow Highway.

TABLE 3-5 – CMP ARTERIAL ANALYSIS FUTURE CONDITIONS						
Responsible Agency	CMP Route	Cross Street	AM		PM	
			V/C	LOS	V/C	LOS
Pomona	Arrow Hwy	Garey Ave	0.84	D	1.11	F
Pomona	Foothill Blvd	Garey Ave	0.76	C	0.69	B

Source: 2010 Congestion Management Program for Los Angeles County, Metropolitan Transportation Authority, 2010.

As shown in Table 3-5, the project degrades LOS at the Gary Avenue/Arrow Highway intersection to LOS F, and unacceptable level for CMP-designated facilities. Impacts and mitigations associated with this are further described in Chapters 5 and 6.

4.0 TRANSPORTATION ANALYSIS

This chapter discusses analysis methodologies and assumptions approved by the City used to evaluate the project impacts and summarizes the level of service of each scenario.

4.1 Analysis Methodology

Fehr & Peers' analysis of intersections employs a methodology based on empirical research conducted by the Transportation Research Board (TRB) and other authorities. Signalized and unsignalized intersection operations were evaluated using methodologies provided in Highway Capacity Manual (HCM) 2000 (TRB), are considered state-of-the-practice methodologies for evaluating intersection operations, and are consistent with the City of Pomona Traffic Impact Study Guidelines requirements.

The City of Pomona Traffic Impact Study Guidelines note that there are several CMP designated facilities within the City of Pomona. These facilities must be evaluated using the criteria and methodologies consistent with the County's CMP requirements. CMP assessment should be conducted for all study scenarios.

The CMP roadways within Pomona are Foothill Boulevard, Arrow Highway, I-10, SR-57, SR-60, and SR-71. The guidelines also apply to signalized intersections that include freeway on- or off-ramps.

The Los Angeles County Congestion Management Program (CMP) guidelines specify that certain facilities maintain LOS E or better for acceptable performance. LOS F is therefore considered unacceptable on CMP facilities. CMP facilities include five freeways, Foothill Boulevard, and Arrow Highway within the City of Pomona.

4.1.1 INTERSECTION ASSESSMENT

Intersection level of service is determined based on average delay per the standard Transportation Research Board (TRB) Highway Capacity Manual 2000 (HCM 2000) methodology. This is in line with the City of Pomona Traffic Impact Study Guidelines. Delay (in seconds) was calculated at each study intersection using Trafficware Synchro Software v. 8, and compared to the LOS thresholds outlined in the HCM 2000. CMP-designated intersections were also evaluated using the Intersection Capacity Utilization Methodology and the TRAFFIX level of service software. Descriptions of the LOS letter grades for signalized and unsignalized intersections are provided in Table 4-1.

TABLE 4-1 – INTERSECTION AND FREEWAY LOS CRITERIA

Level of Service	Description	Volume-to-Capacity Ratio (CMP intersections/freeways)	Signalized Delay (Seconds)	Unsignalized Delay (Seconds)
A	Operations with very low delay occurring with favorable progression and/or short cycle length.	0-0.60	≤ 15.0	≤ 10.0
B	Operations with low delay occurring with good progression and/or short cycle lengths.	0.61-0.70	> 15.0 to 25.0	>10.0 to 15.0
C	Operations with average delays resulting from fair progression and/or longer cycle lengths. Individual cycle failures begin to appear.	0.71-0.80	> 25.0 to 35.0	>15.0 to 25.0
D	Operations with longer delays due to a combination of unfavorable progression, long cycle lengths, or high V/C ratios. Many vehicles stop and individual cycle failures are noticeable.	0.81-0.90	> 35.0 to 55.0	>25.0 to 35.0
E	Operations with high delay values indicating poor progression, long cycle lengths, and high V/C ratios. Individual cycle failures are frequent occurrences.	0.91-1.00	> 55.0 to 80.0	>35.0 to 50.0
F	Operation with delays unacceptable to most drivers occurring due to over saturation, poor progression, or very long cycle lengths.	> 1.01	> 80.0	>50.0

Source: *Highway Capacity Manual* (Transportation Research Board, 2000) and the LA County Congestion Management Program (2010).

The HCM 2000 methodology for signalized and all-way stop-controlled intersections estimates the average control delay for the vehicle at the intersection. For side-street stop-controlled intersections, the methodology estimates the control delays for each turning movement and identifies the delay for the longest delayed approach (if there is a shared lane, delay is averaged for all turning movements from that lane). After the quantitative delay estimates are complete, the methodology assigns a qualitative letter grade that represents the operations of the intersection. These grades range from level of service (LOS) A (minimal delay) to LOS F (excessive congestion). LOS E represents at-capacity operations.

The CMP intersection assessment was completed using the TRAFFIX analysis software using the ICU analysis methodology (consistent with CMP requirements). All defaults were set consistent with CMP analysis requirements within the software package.

4.1.2 ROADWAY SEGMENT ASSESSMENT

The City of Pomona Traffic Impact Study Guidelines specifies for roadway link analysis to use the latest version of the TRB, HCM 2000 methodology. Roadway segment operations were evaluated by comparing the projected traffic volumes to the maximum two-way daily traffic volume identified in the HCM 2000 (TRB). These traffic volumes are shown in Table 4-2 below. In accordance with the City's Draft General Plan mobility Element, Table 4-3 defines the acceptable LOS thresholds for roadway links.

The proposed General Plan includes new LOS standards that would vary by location and street context. By establishing LOS guidelines for different Place Types, as seen below in Table 4-3, the City intends to use LOS as a tool to gauge when improvements to intersections or roadways throughout the City may be needed and to begin planning for these improvements. The City's response to congestion in specific locations, as indicated by degrading LOS, will be guided by its traffic congestion management policy.

TABLE 4-2 – ROADWAY LINK DAILY LOS THRESHOLDS

Facility Type	C	D	E
4-Lane, Multilane Highway [1]	25,300	32,800	36,500
4-Lane Arterial, Divided	19,200	35,400	37,400
4-Lane Arterial, Undivided	17,500	27,400	28,900
3-Lane Arterial [2]	13,600	22,500	23,800
2-Lane Arterial	9,700	17,600	18,700
2-Lane Collector	9,000	11,300	12,500
2-Lane Local	8,200	10,200	11,300

Notes:
1. LOS capacity threshold is for one direction.
2. 3-Lane Arterial capacity derived from average of 2-Lane Arterial and 4-Lane Arterial, Undivided.
- LOS is not achievable due to type of facility.

Sources: *Highway Capacity Manual* (Transportation Research Board, 2000).
Fehr & Peers, 2012

TABLE 4-3 – MOTOR VEHICLE LEVEL OF SERVICE GUIDELINES

Functional Roadway Classification	Place Type: High Volume Vehicle Corridor	Place Type: Pedestrian Oriented District	Place Type: Residential Area	Place Type: All Other Areas
CMP Roadway	E	E	E	E
Major Arterial	E	E	D	D
Minor Arterial	E	E	C	D
Collector	D	D	C	D
Local	C	D	C	C

Notes:
1. At stop-controlled intersections, the LOS standard would not apply unless signalization is warranted based on warrant standards.
2. Where two streets intersect, the larger facility's LOS guideline shall apply.
3. Congestion management plan (CMP) roadways within Pomona are Foothill Boulevard, Arrow Highway , I-10, SR-57, SR-60, and SR-71. This standard would apply to signalized intersections that include freeway on- or off-ramps.

Source: Draft Pomona General Plan Update, 2011.

5.0 TRANSPORTATION IMPACTS

To determine significant impacts, the CEQA guidelines were combined with the City's impact criteria and the CMP impact criteria. This information and the resulting impacts are described below:

a) Does the proposed project conflicts with an applicable plan, ordinance or policy?

Threshold: Would the project conflict with an applicable plan, ordinance, or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit?

For the purposes of this project, the following traffic components would result in a traffic impact:

- *Implementation of the plans degrades operations for study intersections and roadway segments below the thresholds identified in Table 4-3 at City intersections.*

The analyses presented in Chapter 3 indicate that the project would result in a ***significant impact*** at the following locations:

- Garey Avenue and Arrow Highway
- Towne Avenue and Arrow Highway
- Garey Avenue / McKinley Ave & I-10
- Fairplex Drive and Holt Drive / SR-71 Ramps
- Humane Way and Roselawn Avenue
- Roselawn Avenue and Pomona Boulevard
- Mission Boulevard and Temple Avenue
- Phillips Ranch Road and Rio Rancho Road
- Garey Avenue and Philadelphia Street
- Pomona Boulevard and Temple Avenue

Mitigations for these impacts are described further in Chapter 6.

b) Would the project conflict with an applicable congestion management program (CMP), including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways?

Threshold: For the purposes of this project, the following traffic components would result in a traffic impact:

- *Implementation of the plans degrades operations for CMP facilities from an acceptable LOS E or better to LOS F, or*
- *Implementation of the plans increases the volume-to-capacity ratio at CMP-designated facilities by 0.02 or more for facilities already operating at LOS F.*

The results of the assessment indicate that plans would result in a ***significant impact*** at the following locations:

- Intersection of Garey Avenue and Arrow Highway (PM Peak Hour) – currently operates at an acceptable level but is projected to operate at LOS F with the proposed plans.
- I-10 west of Indian Hill Boulevard (AM Peak Hour) – currently operates at LOS E and the proposed plans will degrade operations to LOS F(0).
- I-10 at Dudley Street – currently operates at LOS F(0) with a volume-to-capacity ratio of 1.02; the plans will increase the volume-to-capacity ratio to 1.04.

c) Would the project result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?

The plans will not affect air traffic patterns and this impact is considered ***less-than-significant.***

d) Would the project substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?

The plans will not increase these hazards. Additionally, the City has design standards that all future facilities will be required to meet. As such, this impact is considered ***less-than-significant.***

e) Would the project result in inadequate emergency access?

These are planning documents and do not inherently represent project-specific components. As such, the plans do not result in inadequate emergency access. However, any development or improvement processed under these plans should be reviewed by the City Emergency Services Departments to ensure adequate emergency access. As such, this impact is considered ***less-than-significant.***

f) Would the project conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities?

These planning documents are the policies, plans, and programs related to non-automotive travel. As such, this impact is considered ***less-than-significant.***

As noted above, there are several impacts that are subject to mitigation. Mitigation measures to reduce the impacts to a less-than-significant level are described in Chapter 6.

6.0 MITIGATIONS AND RECOMMENDATIONS

This chapter summarizes the mitigation measures that would reduce project impacts to a less-than-significant level.

6.1 MITIGATION MEASURES

6.1.1 INTERSECTIONS

The following intersections were identified as resulting in a significant impact:

- Garey Avenue and Arrow Highway (City and CMP impact)
- Towne Avenue and Arrow Highway
- Garey Avenue and McKinley Avenue & I-10
- Fairplex Drive and Holt Drive / SR-71 Ramps
- Humane Way and Roselawn Avenue
- Roselawn Avenue and Pomona Boulevard
- Mission Boulevard and Temple Avenue
- Phillips Ranch Road and Rio Rancho Road
- Garey Avenue and Philadelphia Street
- Pomona Boulevard and Temple Avenue

Figure 6-1 identifies the intersection improvements that would be required to satisfy the LOS significance criteria. The City shall work with future development to implement the improvements. Additionally, to implement the identified improvements, the Active Transportation Plan shall be updated at the Garey Avenue/Arrow Highway and Garey Avenue/ Philadelphia Street intersections to the Recommended Future Roadway Improvements lane configurations shown in Figure 6-1

Please note that no improvements are identified for the Pomona Boulevard and Temple Avenue intersection. This intersection is expected to operate at an unacceptable LOS F with the proposed project and no feasible mitigation measures exist for the intersection to operate at an acceptable level.

With the identified improvements, most of the facilities would operate at an acceptable level. However, the Pomona Boulevard and Temple Avenue intersection will operate unacceptably. Therefore the project impact at the Pomona Boulevard and Temple Avenue intersection is considered ***significant and unavoidable.*** The project impact to the other impacted intersections is considered less-than-significant after mitigation.

6.1.2 FREEWAY SEGMENTS

The following freeway segments are projected to operate unacceptably:

- I-10, West of Indian Hill Boulevard (AM Peak Hour)
- I-10, At Dudley (PM Peak Hour)

These facilities are controlled by Caltrans and the City cannot guarantee implementation of any capacity improvements to these segments. As such, the impacts to the freeway facilities are considered ***significant and unavoidable.***

6.2 RECOMMENDATIONS

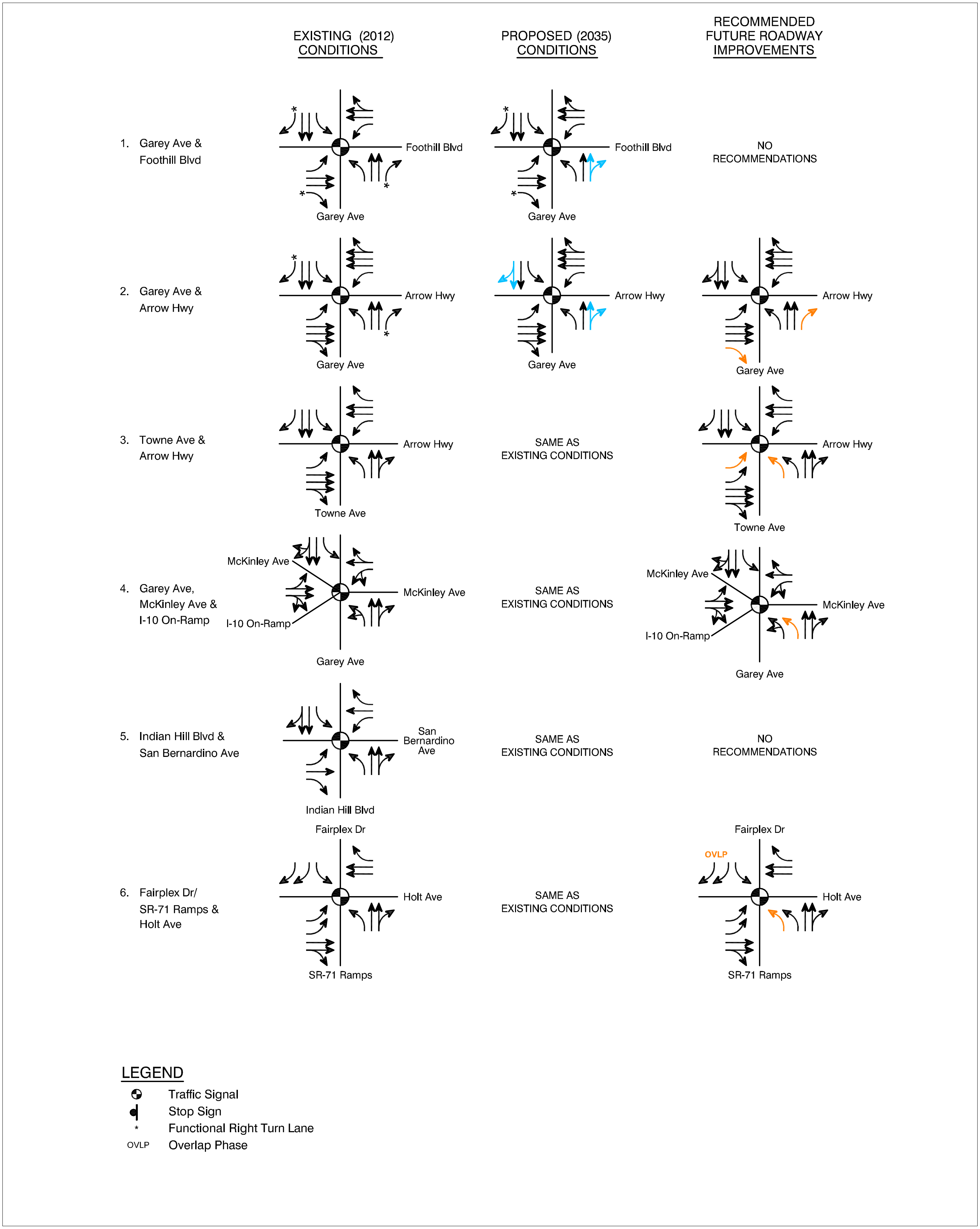
In addition to the mitigation measures described above, our assessment indicated several areas that should be considered within the context of the General Plan, Corridor Specific Plan, and Alternative Transportation Plan. These are described in detail below.

6.2.1 NEIGHBORHOOD TRAFFIC INTRUSION

The roadway segment assessment identifies that, with completion of the SR-71 project (which removes the West Phillips Street connection to SR-71), some 4,000 additional vehicles will funnel through the neighborhood and impact Westmont Avenue. As such, Fehr & Peers recommends that the City consider speed control measures in the neighborhood generally bound by SR-71 to the east, Mission Boulevard to the north, and hills to the south and west. Specific measures to consider would include radar speed limit signs, bulb outs, chicanes, or raised crosswalks. Implementing these measures will assist in managing the increased traffic to this neighborhood.

6.2.2 ACTIVE TRANSPORTATION PLAN

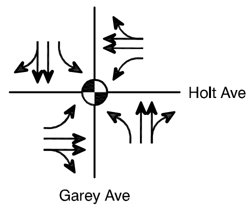
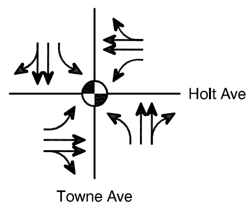
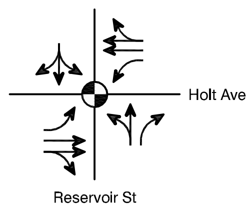
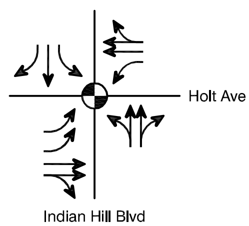
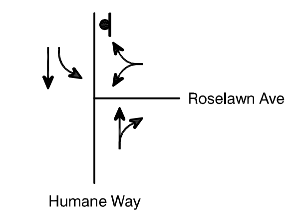
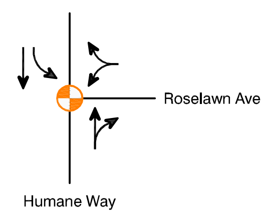
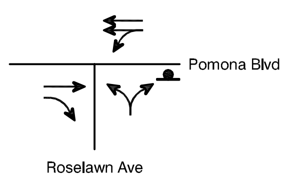
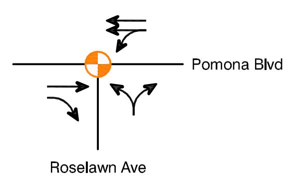
As identified above, the active transportation plan identified some pedestrian intersection improvements that would affect intersection geometrics that conflict with the City's vehicle level of service thresholds. Fehr & Peers recommends that plan to be updated to incorporate the improvements identified in Figure 6-1.



FEHR & PEERS

INTERSECTION LANE CONFIGURATION RECOMMENDATIONS

FIGURE 6-1

	EXISTING (2012) CONDITIONS	PROPOSED (2035) CONDITIONS	RECOMMENDED FUTURE ROADWAY IMPROVEMENTS
7. Garey Ave & Holt Ave		SAME AS EXISTING CONDITIONS	NO RECOMMENDATIONS
8. Towne Ave & Holt Ave		SAME AS EXISTING CONDITIONS	NO RECOMMENDATIONS
9. Reservoir St & Holt Ave		SAME AS EXISTING CONDITIONS	NO RECOMMENDATIONS
10. Indian Hill Blvd & Holt Ave		SAME AS EXISTING CONDITIONS	NO RECOMMENDATIONS
11. Humane Way & Roselawn Ave		SAME AS EXISTING CONDITIONS	
12. Roselawn Ave & Pomona Blvd		SAME AS EXISTING CONDITIONS	

LEGEND

- Traffic Signal
- Stop Sign
- * Functional Right Turn Lane
- OVLP Overlap Phase

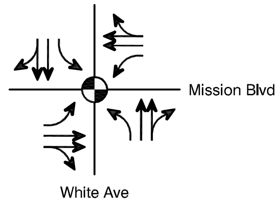
FEHR PEERS

INTERSECTION LANE CONFIGURATION RECOMMENDATIONS

FIGURE 6-1

EXISTING (2012) CONDITIONS | PROPOSED (2035) CONDITIONS | RECOMMENDED FUTURE ROADWAY IMPROVEMENTS

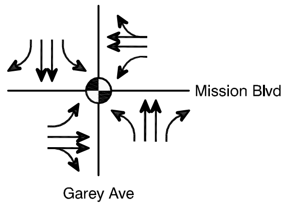
13. White Ave & Mission Blvd

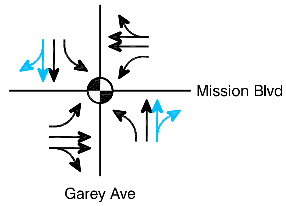


SAME AS EXISTING CONDITIONS

NO RECOMMENDATIONS

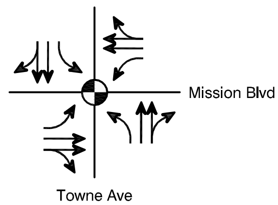
14. Garey Ave & Mission Blvd





NO RECOMMENDATIONS

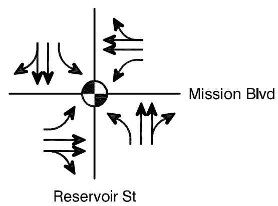
15. Towne Ave & Mission Blvd



SAME AS EXISTING CONDITIONS

NO RECOMMENDATIONS

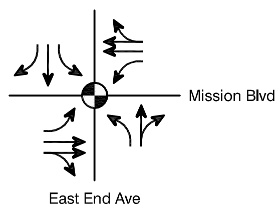
16. Reservoir St & Mission Blvd



SAME AS EXISTING CONDITIONS

NO RECOMMENDATIONS

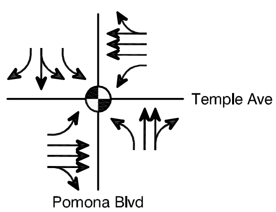
17. East End Ave & Mission Blvd



SAME AS EXISTING CONDITIONS

NO RECOMMENDATIONS

18. Pomona Blvd & Temple Ave



SAME AS EXISTING CONDITIONS

NO RECOMMENDATIONS

LEGEND

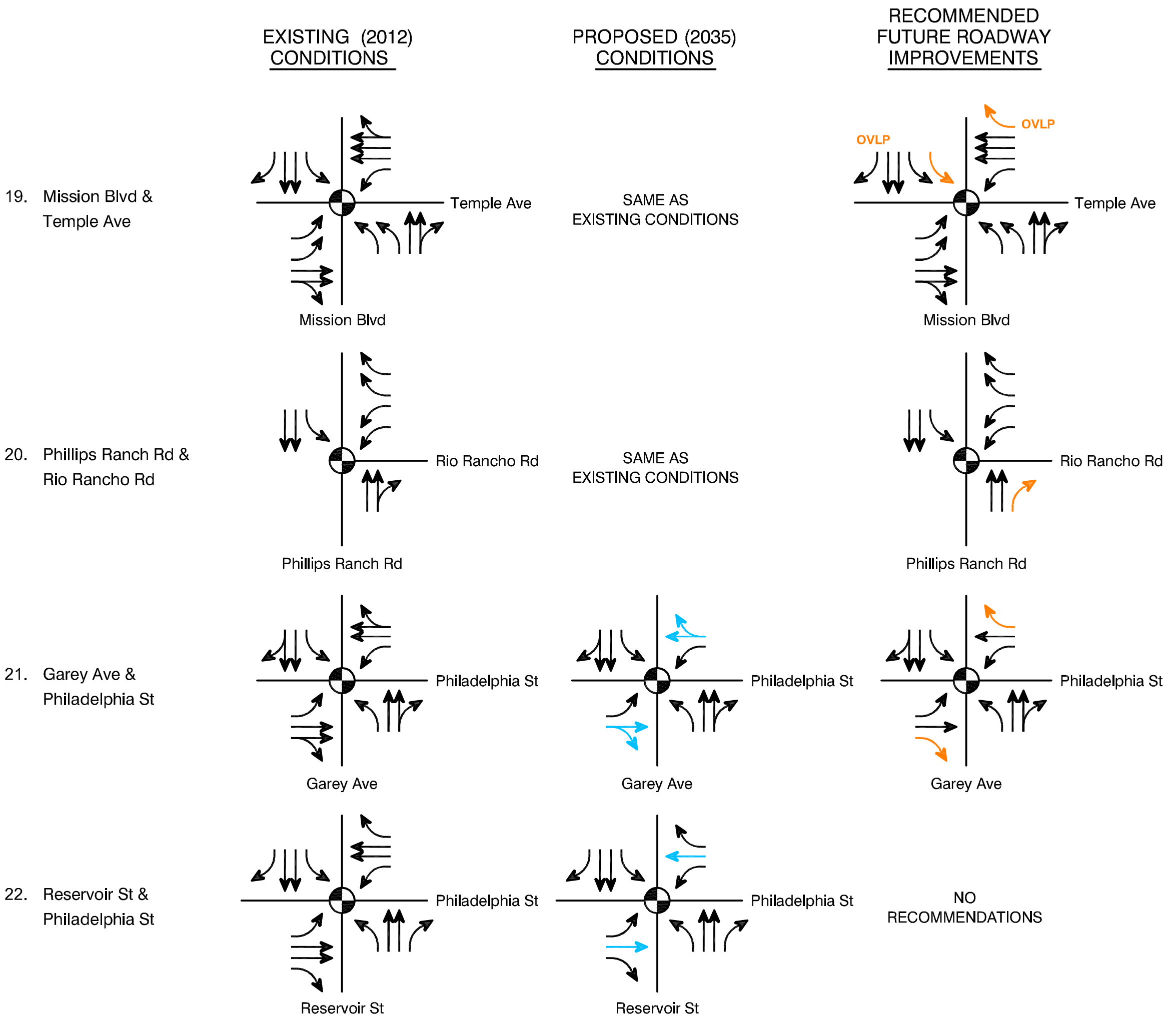
- Traffic Signal
- Stop Sign
- * Functional Right Turn Lane
- OVLP Overlap Phase

FEHR PEERS

INTERSECTION LANE CONFIGURATION RECOMMENDATIONS

Jul 19, 2013 PH
W:\Orange County N Drive\PROJECTS\OC12\0206_Pomona GP\Graphics\ACAD\Pomona GP Lane Configs 7.19.13.dwg

FIGURE 6-1



LEGEND

Traffic Signal
Stop Sign
* Functional Right Turn Lane
OVLP Overlap Phase

FEHR PEERS

INTERSECTION LANE CONFIGURATION RECOMMENDATIONS

Jul 19, 2013 PH
W:\Orange County N Drive\PROJECTS\OC12\0206_Pomona GP\Graphics\ACAD\Pomona GP Lane Configs 7.19.13.dwg

FIGURE 6-1

6.2.3 TRUCK ROUTES

Fehr & Peers reviewed the currently designated truck routes as shown in the City's General Plan. Fehr & Peers recommends removing the designated truck routes on the following roadway from the City's Truck Route Designation Map:

- White Ave between Mission Blvd and Arrow Hwy
- Garey Ave between SR-60 and Holt Ave
- Towne Ave between Riverside Dr and Foothill Blvd
- Indian Hill Blvd between Grand Ave and Holt Ave
- Bonita Ave between Fulton Rd and Carnegie Ave
- Pomona Blvd between Valley Blvd and SR-71
- Temple Ave between Valley Blvd and SR-57
- 2nd St between SR-71 and White Ave
- Mission Blvd between SR-71 and Reservoir St
- Phillips Blvd between Garey Ave and East End Ave

These roadways generally do not connect to any specific industrial uses nor should they be used for regional truck traffic. Therefore, Fehr & Peers recommends they be removed from the Truck Route Designation Map.

APPENDIX A: EXISTING TRAFFIC COUNTS

Prepared by NDS/ATD

VOLUME

Village Loop Rd btwn Mill Valley Rd North Ranch Rd

Day: Wednesday
Date: 5/30/2012

City: Pomona
Project #: CA12_5221_001

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	670	610	1,280

AM Period	NB	SB	EB		WB		TOTAL		PM Period	NB	SB	EB		WB		TOTAL	
00:00			5		6		11		12:00			10		8		18	
00:15			3		1		4		12:15			9		9		18	
00:30			5		0		5		12:30			10		6		16	
00:45			1	14	0	7	1	21	12:45			8	37	5	28	13	65
01:00			1		3		4		13:00			6		10		16	
01:15			1		0		1		13:15			15		13		28	
01:30			0		3		3		13:30			16		12		28	
01:45			1	3	2	8	3	11	13:45			10	47	7	42	17	89
02:00			0		0		0		14:00			7		13		20	
02:15			0		0		0		14:15			13		12		25	
02:30			0		1		1		14:30			22		15		37	
02:45			0		0	1	0	1	14:45			16	58	8	48	24	106
03:00			1		2		3		15:00			19		11		30	
03:15			0		0		0		15:15			6		4		10	
03:30			0		0		0		15:30			11		11		22	
03:45			0	1	0	2	0	3	15:45			10	46	10	36	20	82
04:00			0		0		0		16:00			6		8		14	
04:15			0		2		2		16:15			10		11		21	
04:30			0		1		1		16:30			11		12		23	
04:45			0		1	4	1	4	16:45			14	41	11	42	25	83
05:00			0		2		2		17:00			9		9		18	
05:15			4		0		4		17:15			18		9		27	
05:30			1		5		6		17:30			15		5		20	
05:45			3	8	1	8	4	16	17:45			15	57	10	33	25	90
06:00			4		5		9		18:00			11		5		16	
06:15			3		10		13		18:15			12		12		24	
06:30			3		4		7		18:30			8		1		9	
06:45			2	12	9	28	11	40	18:45			15	46	4	22	19	68
07:00			9		15		24		19:00			9		6		15	
07:15			9		18		27		19:15			4		8		12	
07:30			10		25		35		19:30			13		7		20	
07:45			18	46	20	78	38	124	19:45			6	32	8	29	14	61
08:00			22		20		42		20:00			7		6		13	
08:15			11		12		23		20:15			8		2		10	
08:30			5		7		12		20:30			4		9		13	
08:45			4	42	10	49	14	91	20:45			8	27	6	23	14	50
09:00			7		10		17		21:00			11		5		16	
09:15			11		7		18		21:15			3		1		4	
09:30			8		8		16		21:30			6		6		12	
09:45			8	34	11	36	19	70	21:45			3	23	3	15	6	38
10:00			7		4		11		22:00			5		2		7	
10:15			8		8		16		22:15			3		2		5	
10:30			4		3		7		22:30			2		6		8	
10:45			8	27	8	23	16	50	22:45			8	18	3	13	11	31
11:00			10		4		14		23:00			2		4		6	
11:15			8		8		16		23:15			5		2		7	
11:30			12		3		15		23:30			1		3		4	
11:45			9	39	9	24	18	63	23:45			4	12	2	11	6	23
TOTALS				226		268		**494**	**TOTALS**				444		342		**786**
SPLIT %				45.7%		54.3%		**38.6%**	**SPLIT %**				56.5%		43.5%		**61.4%**

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	670	610	1,280

	NB	SB	EB	WB	TOTAL		NB	SB	EB	WB	TOTAL
AM Peak Hour			07:30	07:15	**07:15**	**PM Peak Hour**			14:15	14:00	**14:15**
AM Pk Volume			61	83	**142**	**PM Pk Volume**			70	48	**116**
Pk Hr Factor			0.693	0.830	**0.845**	**Pk Hr Factor**			0.795	0.800	**0.784**
7 - 9 Volume	0	0	88	127	**215**	**4 - 6 Volume**	0	0	98	75	**173**
7 - 9 Peak Hour			07:30	07:15	**07:15**	**4 - 6 Peak Hour**			17:00	16:15	**16:30**
7 - 9 Pk Volume	0	0	61	83	**142**	**4 - 6 Pk Volume**	0	0	57	43	**93**
Pk Hr Factor	0.000	0.000	0.693	0.830	**0.845**	**Pk Hr Factor**	0.000	0.000	0.792	0.896	**0.861**

Prepared by NDS/ATD

VOLUME

Humane Way btwn Roselawn Ave & Valley Blvd

Day: Wednesday **City:** Pomona

Date: 5/30/2012 **Project #:** CA12_5221_003

DAILY TOTALS	NB	SB	EB	WB	Total
	4,167	5,615	0	0	9,782

AM Period	NB		SB		EB	WB	TOTAL		PM Period	NB		SB		EB	WB	TOTAL	
00:00	9		5				14		12:00	67		74				141	
00:15	9		7				16		12:15	58		49				107	
00:30	11		10				21		12:30	62		59				121	
00:45	7	36	7	29			14	65	12:45	53	240	59	241			112	481
01:00	18		6				24		13:00	49		77				126	
01:15	3		4				7		13:15	55		97				152	
01:30	1		9				10		13:30	64		78				142	
01:45	5	27	3	22			8	49	13:45	87	255	73	325			160	580
02:00	4		1				5		14:00	64		81				145	
02:15	5		6				11		14:15	46		63				109	
02:30	2		1				3		14:30	89		69				158	
02:45	0	11	3	11			3	22	14:45	65	264	64	277			129	541
03:00	3		1				4		15:00	87		100				187	
03:15	1		2				3		15:15	68		73				141	
03:30	3		8				11		15:30	134		89				223	
03:45	4	11	11	22			15	33	15:45	94	383	109	371			203	754
04:00	5		4				9		16:00	126		131				257	
04:15	14		8				22		16:15	104		120				224	
04:30	3		18				21		16:30	120		128				248	
04:45	15	37	27	57			42	94	16:45	134	484	140	519			274	1003
05:00	14		28				42		17:00	131		173				304	
05:15	10		38				48		17:15	113		272				385	
05:30	22		57				79		17:30	97		267				364	
05:45	22	68	79	202			101	270	17:45	77	418	246	958			323	1376
06:00	26		49				75		18:00	65		168				233	
06:15	26		52				78		18:15	49		113				162	
06:30	34		60				94		18:30	43		77				120	
06:45	25	111	68	229			93	340	18:45	53	210	44	402			97	612
07:00	46		65				111		19:00	37		50				87	
07:15	66		75				141		19:15	32		40				72	
07:30	134		121				255		19:30	38		31				69	
07:45	98	344	156	417			254	761	19:45	32	139	36	157			68	296
08:00	56		105				161		20:00	23		49				72	
08:15	59		81				140		20:15	25		46				71	
08:30	55		57				112		20:30	29		48				77	
08:45	49	219	74	317			123	536	20:45	33	110	43	186			76	296
09:00	63		60				123		21:00	21		28				49	
09:15	78		48				126		21:15	15		22				37	
09:30	42		46				88		21:30	26		23				49	
09:45	53	236	55	209			108	445	21:45	13	75	19	92			32	167
10:00	43		53				96		22:00	17		28				45	
10:15	37		54				91		22:15	17		17				34	
10:30	42		40				82		22:30	6		16				22	
10:45	50	172	54	201			104	373	22:45	17	57	19	80			36	137
11:00	51		44				95		23:00	16		12				28	
11:15	50		73				123		23:15	16		15				31	
11:30	59		66				125		23:30	13		15				28	
11:45	48	208	55	238			103	446	23:45	7	52	11	53			18	105
TOTALS		1480		1954				**3434**	**TOTALS**		2687		3661				**6348**
SPLIT %		43.1%		56.9%				**35.1%**	**SPLIT %**		42.3%		57.7%				**64.9%**

DAILY TOTALS	NB	SB	EB	WB	Total
	4,167	5,615	0	0	9,782

	NB	SB	EB	WB	TOTAL		NB	SB	EB	WB	TOTAL
AM Peak Hour	07:15	07:30			**07:15**	**PM Peak Hour**	16:30	17:00			**17:00**
AM Pk Volume	354	463			**811**	**PM Pk Volume**	498	958			**1376**
Pk Hr Factor	0.660	0.742			**0.795**	**Pk Hr Factor**	0.929	0.881			**0.894**
7 - 9 Volume	563	734	0	0	**1297**	**4 - 6 Volume**	902	1477	0	0	**2379**
7 - 9 Peak Hour	07:15	07:30			**07:15**	**4 - 6 Peak Hour**	16:30	17:00			**17:00**
7 - 9 Pk Volume	354	463	0	0	**811**	**4 - 6 Pk Volume**	498	958	0	0	**1376**
Pk Hr Factor	0.660	0.742	0.000	0.000	**0.795**	**Pk Hr Factor**	0.929	0.881	0.000	0.000	**0.894**

Prepared by NDS/ATD

VOLUME

Westmont Ave btwn Brea Canyon Rd & Buffington St

Day: Wednesday
Date: 5/30/2012

City: Pomona
Project #: CA12_5221_002

DAILY TOTALS	NB	SB	EB	WB	Total
	1,682	1,896	0	0	3,578

AM Period	NB		SB		EB	WB	TOTAL		PM Period	NB		SB		EB	WB	TOTAL	
00:00	3		8				11		12:00	22		37				59	
00:15	4		9				13		12:15	26		25				51	
00:30	7		11				18		12:30	32		29				61	
00:45	4	18	4	32			8	50	12:45	26	106	31	122			57	228
01:00	1		4				5		13:00	23		25				48	
01:15	2		2				4		13:15	26		26				52	
01:30	0		3				3		13:30	21		24				45	
01:45	1	4	0	9			1	13	13:45	21	91	22	97			43	188
02:00	2		0				2		14:00	28		24				52	
02:15	3		3				6		14:15	19		28				47	
02:30	3		2				5		14:30	21		25				46	
02:45	3	11	1	6			4	17	14:45	29	97	32	109			61	206
03:00	1		3				4		15:00	24		41				65	
03:15	2		1				3		15:15	22		39				61	
03:30	6		2				8		15:30	16		20				36	
03:45	9	18	0	6			9	24	15:45	19	81	34	134			53	215
04:00	9		2				11		16:00	21		37				58	
04:15	5		0				5		16:15	28		33				61	
04:30	19		0				19		16:30	21		43				64	
04:45	10	43	2	4			12	47	16:45	24	94	42	155			66	249
05:00	10		5				15		17:00	22		46				68	
05:15	21		2				23		17:15	24		57				81	
05:30	15		3				18		17:30	29		49				78	
05:45	22	68	4	14			26	82	17:45	22	97	53	205			75	302
06:00	23		11				34		18:00	31		47				78	
06:15	19		7				26		18:15	24		49				73	
06:30	37		10				47		18:30	22		36				58	
06:45	26	105	12	40			38	145	18:45	13	90	32	164			45	254
07:00	30		11				41		19:00	28		40				68	
07:15	38		8				46		19:15	21		36				57	
07:30	35		9				44		19:30	22		33				55	
07:45	30	133	11	39			41	172	19:45	16	87	40	149			56	236
08:00	30		10				40		20:00	18		27				45	
08:15	29		15				44		20:15	24		32				56	
08:30	32		18				50		20:30	18		31				49	
08:45	26	117	15	58			41	175	20:45	17	77	21	111			38	188
09:00	15		13				28		21:00	20		28				48	
09:15	22		14				36		21:15	15		27				42	
09:30	26		12				38		21:30	13		13				26	
09:45	20	83	16	55			36	138	21:45	6	54	26	94			32	148
10:00	22		20				42		22:00	9		25				34	
10:15	17		15				32		22:15	10		16				26	
10:30	20		22				42		22:30	5		10				15	
10:45	20	79	28	85			48	164	22:45	6	30	9	60			15	90
11:00	22		21				43		23:00	5		10				15	
11:15	19		26				45		23:15	4		7				11	
11:30	20		33				53		23:30	8		14				22	
11:45	18	79	30	110			48	189	23:45	3	20	7	38			10	58
TOTALS		758		458				1216	TOTALS		924		1438				2362
SPLIT %		62.3%		37.7%				34.0%	SPLIT %		39.1%		60.9%				66.0%

DAILY TOTALS	NB	SB	EB	WB	Total
	1,682	1,896	0	0	3,578

	NB	SB	EB	WB	Total		NB	SB	EB	WB	Total
AM Peak Hour	07:00	11:15			11:45	PM Peak Hour	12:15	17:15			17:15
AM Pk Volume	133	126			219	PM Pk Volume	107	206			312
Pk Hr Factor	0.875	0.851			0.898	Pk Hr Factor	0.836	0.904			0.963
7 - 9 Volume	250	97	0	0	347	4 - 6 Volume	191	360	0	0	551
7 - 9 Peak Hour	07:00	08:00			07:45	4 - 6 Peak Hour	16:45	17:00			17:00
7 - 9 Pk Volume	133	58	0	0	175	4 - 6 Pk Volume	99	205	0	0	302
Pk Hr Factor	0.875	0.806	0.000	0.000	0.875	Pk Hr Factor	0.853	0.899	0.000	0.000	0.932

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	29	358	182	315	343	35	196	79	124	91	142	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	1.00	0.85	1.00	0.99		1.00	0.91		1.00	0.97	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3539	1583	1770	3490		1770	3215		1770	3434	
Flt Permitted	0.51	1.00	1.00	0.52	1.00		0.63	1.00		0.61	1.00	
Satd. Flow (perm)	952	3539	1583	972	3490		1175	3215		1143	3434	
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)	32	389	198	342	373	38	213	86	135	99	154	38
RTOR Reduction (vph)	0	0	94	0	14	0	0	91	0	0	26	0
Lane Group Flow (vph)	32	389	104	342	397	0	213	130	0	99	166	0
Turn Type	Perm		Perm	Perm			Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8			2			6		
Actuated Green, G (s)	29.0	29.0	29.0	29.0	29.0		18.0	18.0		18.0	18.0	
Effective Green, g (s)	29.0	29.0	29.0	29.0	29.0		18.0	18.0		18.0	18.0	
Actuated g/C Ratio	0.53	0.53	0.53	0.53	0.53		0.33	0.33		0.33	0.33	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Lane Grp Cap (vph)	502	1866	835	513	1840		385	1052		374	1124	
v/s Ratio Prot		0.11			0.11			0.04			0.05	
v/s Ratio Perm	0.03		0.07	c0.35			c0.18			0.09		
v/c Ratio	0.06	0.21	0.13	0.67	0.22		0.55	0.12		0.26	0.15	
Uniform Delay, d1	6.4	6.9	6.6	9.5	6.9		15.2	13.0		13.6	13.1	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.2	0.3	0.3	6.7	0.3		5.6	0.2		1.7	0.3	
Delay (s)	6.6	7.2	6.9	16.2	7.2		20.8	13.2		15.3	13.4	
Level of Service	A	A	A	B	A		C	B		B	B	
Approach Delay (s)		7.0			11.3			17.0			14.0	
Approach LOS		A			B			B			B	

Intersection Summary			
HCM Average Control Delay	11.6	HCM Level of Service	B
HCM Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	55.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	56.6%	ICU Level of Service	B
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)	97	561	166	237	512	36	312	181	193	97	96	47
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	1.00	0.85	1.00	0.99		1.00	0.92		1.00	0.95	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3539	1583	1770	3504		1770	3265		1770	3365	
Flt Permitted	0.39	1.00	1.00	0.38	1.00		0.65	1.00		0.50	1.00	
Satd. Flow (perm)	730	3539	1583	715	3504		1218	3265		928	3365	
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)	105	610	180	258	557	39	339	197	210	105	104	51
RTOR Reduction (vph)	0	0	95	0	9	0	0	125	0	0	32	0
Lane Group Flow (vph)	105	610	85	258	587	0	339	282	0	105	123	0
Turn Type	Perm		Perm	Perm			Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8			2			6		
Actuated Green, G (s)	26.0	26.0	26.0	26.0	26.0		21.0	21.0		21.0	21.0	
Effective Green, g (s)	26.0	26.0	26.0	26.0	26.0		21.0	21.0		21.0	21.0	
Actuated g/C Ratio	0.47	0.47	0.47	0.47	0.47		0.38	0.38		0.38	0.38	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Lane Grp Cap (vph)	345	1673	748	338	1656		465	1247		354	1285	
v/s Ratio Prot		0.17			0.17			0.09			0.04	
v/s Ratio Perm	0.14		0.05	c0.36			c0.28			0.11		
v/c Ratio	0.30	0.36	0.11	0.76	0.35		0.73	0.23		0.30	0.10	
Uniform Delay, d1	8.9	9.2	8.1	12.0	9.2		14.6	11.5		11.9	10.9	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	2.3	0.6	0.3	15.0	0.6		9.7	0.4		2.1	0.1	
Delay (s)	11.2	9.9	8.4	27.0	9.8		24.2	11.9		14.0	11.1	
Level of Service	B	A	A	C	A		C	B		B	B	
Approach Delay (s)		9.7			15.0			17.5			12.2	
Approach LOS		A			B			B			B	

Intersection Summary			
HCM Average Control Delay	13.7	HCM Level of Service	B
HCM Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	55.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	63.4%	ICU Level of Service	B
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)	41	201	66	92	391	104	120	477	85	94	632	45
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	0.95		1.00	0.95	
Frt	1.00	0.96		1.00	1.00	0.85	1.00	0.98		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3407		1770	3539	1583	1770	3459		1770	3504	
Flt Permitted	0.50	1.00		0.57	1.00	1.00	0.33	1.00		0.40	1.00	
Satd. Flow (perm)	932	3407		1070	3539	1583	608	3459		739	3504	
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)	45	218	72	100	425	113	130	518	92	102	687	49
RTOR Reduction (vph)	0	46	0	0	0	73	0	32	0	0	12	0
Lane Group Flow (vph)	45	244	0	100	425	40	130	578	0	102	724	0
Turn Type	Perm			Perm		Perm	Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8		8	2			6		
Actuated Green, G (s)	16.0	16.0		16.0	16.0	16.0	21.0	21.0		21.0	21.0	
Effective Green, g (s)	16.0	16.0		16.0	16.0	16.0	21.0	21.0		21.0	21.0	
Actuated g/C Ratio	0.36	0.36		0.36	0.36	0.36	0.47	0.47		0.47	0.47	
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Grp Cap (vph)	331	1211		380	1258	563	284	1614		345	1635	
v/s Ratio Prot		0.07			c0.12			0.17			0.21	
v/s Ratio Perm	0.05			0.09		0.03	c0.21			0.14		
v/c Ratio	0.14	0.20		0.26	0.34	0.07	0.46	0.36		0.30	0.44	
Uniform Delay, d1	9.8	10.1		10.3	10.6	9.6	8.1	7.7		7.4	8.1	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.9	0.4		1.7	0.7	0.2	5.2	0.6		2.2	0.9	
Delay (s)	10.7	10.4		12.0	11.3	9.8	13.4	8.3		9.6	8.9	
Level of Service	B	B		B	B	A	B	A		A	A	
Approach Delay (s)		10.5			11.2			9.2			9.0	
Approach LOS		B			B			A			A	

Intersection Summary			
HCM Average Control Delay	9.8	HCM Level of Service	A
HCM Volume to Capacity ratio	0.41		
Actuated Cycle Length (s)	45.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	53.0%	ICU Level of Service	A
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)	109	950	66	120	331	109	101	605	270	143	554	45
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	0.95		1.00	0.95	
Frt	1.00	0.99		1.00	1.00	0.85	1.00	0.95		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3498		1770	3539	1583	1770	3357		1770	3488	
Flt Permitted	0.52	1.00		0.12	1.00	1.00	0.29	1.00		0.17	1.00	
Satd. Flow (perm)	964	3498		231	3539	1583	548	3357		320	3488	
Peak-hour factor, PHF	0.88	0.87	0.72	0.81	0.90	0.83	0.90	0.95	0.81	0.78	0.87	0.66
Adj. Flow (vph)	124	1092	92	148	368	131	112	637	333	183	637	68
RTOR Reduction (vph)	0	8	0	0	0	69	0	29	0	0	10	0
Lane Group Flow (vph)	124	1176	0	148	368	62	112	941	0	183	695	0
Turn Type	Perm			Perm		Perm	Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8		8	2			6		
Actuated Green, G (s)	38.0	38.0		38.0	38.0	38.0	34.0	34.0		34.0	34.0	
Effective Green, g (s)	38.0	38.0		38.0	38.0	38.0	34.0	34.0		34.0	34.0	
Actuated g/C Ratio	0.48	0.48		0.48	0.48	0.48	0.42	0.42		0.42	0.42	
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Grp Cap (vph)	458	1662		110	1681	752	233	1427		136	1482	
v/s Ratio Prot		0.34			0.10			0.28			0.20	
v/s Ratio Perm	0.13			c0.64		0.04	0.20			c0.57		
v/c Ratio	0.27	0.71		1.35	0.22	0.08	0.48	0.66		1.35	0.47	
Uniform Delay, d1	12.7	16.6		21.0	12.3	11.5	16.6	18.4		23.0	16.5	
Progression Factor	1.00	1.00		1.00	1.00	1.00	0.79	0.78		0.85	0.86	
Incremental Delay, d2	1.5	2.6		204.0	0.3	0.2	5.1	1.7		195.4	1.0	
Delay (s)	14.1	19.2		225.0	12.6	11.7	18.2	16.1		214.9	15.3	
Level of Service	B	B		F	B	B	B	B		F	B	
Approach Delay (s)		18.7			61.0			16.3			56.4	
Approach LOS		B			E			B			E	

Intersection Summary			
HCM Average Control Delay	33.6	HCM Level of Service	C
HCM Volume to Capacity ratio	1.35		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	81.6%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	EBR2	WBL2	WBL	WBT	WBR	NBL2	NBL	NBT	NBR
Lane Configurations												
Volume (vph)	4	149	19	20	5	74	113	25	194	26	697	41
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0		4.0		4.0	4.0			4.0	4.0	
Lane Util. Factor		1.00		1.00		1.00	1.00			1.00	0.95	
Frt		0.98		0.85		1.00	0.97			1.00	0.99	
Flt Protected		1.00		1.00		0.95	1.00			0.95	1.00	
Satd. Flow (prot)		1821		1583		1770	1804			1770	3508	
Flt Permitted		0.98		1.00		0.55	1.00			0.33	1.00	
Satd. Flow (perm)		1792		1583		1019	1804			611	3508	
Peak-hour factor, PHF	0.33	0.85	0.68	0.71	0.31	0.74	0.76	0.63	0.92	0.81	0.92	0.85
Adj. Flow (vph)	12	175	28	28	16	100	149	40	211	32	758	48
RTOR Reduction (vph)	0	0	0	21	0	0	16	0	0	0	8	0
Lane Group Flow (vph)	0	215	0	7	0	116	173	0	0	243	798	0
Turn Type	Perm			Perm	Perm	Perm			Perm	Perm		
Protected Phases		4					8				2	
Permitted Phases	4			4	8	8			2	2		
Actuated Green, G (s)		16.0		16.0		16.0	16.0			36.0	36.0	
Effective Green, g (s)		16.0		16.0		16.0	16.0			36.0	36.0	
Actuated g/C Ratio		0.27		0.27		0.27	0.27			0.60	0.60	
Clearance Time (s)		4.0		4.0		4.0	4.0			4.0	4.0	
Lane Grp Cap (vph)		478		422		272	481			367	2105	
v/s Ratio Prot							0.10				0.23	
v/s Ratio Perm		c0.12		0.00		0.11				c0.40		
v/c Ratio		0.45		0.02		0.43	0.36			0.66	0.38	
Uniform Delay, d1		18.3		16.2		18.2	17.8			8.0	6.2	
Progression Factor		1.00		1.00		1.56	1.55			0.55	0.39	
Incremental Delay, d2		3.0		0.1		3.7	1.6			6.7	0.4	
Delay (s)		21.4		16.3		32.1	29.2			11.1	2.8	
Level of Service		C		B		C	C			B	A	
Approach Delay (s)		20.8					30.3				4.7	
Approach LOS		C					C				A	

Intersection Summary			
HCM Average Control Delay	10.6	HCM Level of Service	B
HCM Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	61.5%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	SBL	SBT	SBR	SBR2
Lane Configurations				
Volume (vph)	180	356	281	14
Ideal Flow (vphpl)	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		
Lane Util. Factor	1.00	0.95		
Frt	1.00	0.93		
Flt Protected	0.95	1.00		
Satd. Flow (prot)	1770	3299		
Flt Permitted	0.31	1.00		
Satd. Flow (perm)	586	3299		
Peak-hour factor, PHF	0.92	0.84	0.85	0.70
Adj. Flow (vph)	196	424	331	20
RTOR Reduction (vph)	0	3	0	0
Lane Group Flow (vph)	196	772	0	0
Turn Type	Perm			
Protected Phases		6		
Permitted Phases	6			
Actuated Green, G (s)	36.0	36.0		
Effective Green, g (s)	36.0	36.0		
Actuated g/C Ratio	0.60	0.60		
Clearance Time (s)	4.0	4.0		
Lane Grp Cap (vph)	352	1979		
v/s Ratio Prot		0.23		
v/s Ratio Perm	0.33			
v/c Ratio	0.56	0.39		
Uniform Delay, d1	7.2	6.3		
Progression Factor	1.00	1.00		
Incremental Delay, d2	6.2	0.6		
Delay (s)	13.4	6.8		
Level of Service	B	A		
Approach Delay (s)		8.2		
Approach LOS		A		

Intersection Summary

Movement	EBL2	EBL	EBT	EBR	WBL	WBT	WBR	WBR2	NBL	NBT	NBR	NBR2
Lane Configurations												
Volume (vph)	27	326	26	2	59	110	62	30	1	214	402	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		4.0	4.0	4.0		4.0	4.0		
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00		1.00	0.95		
Frt		1.00	0.98		1.00	1.00	0.85		1.00	0.91		
Flt Protected		0.95	1.00		0.95	1.00	1.00		0.95	1.00		
Satd. Flow (prot)		1770	1823		1770	1863	1583		1770	3213		
Flt Permitted		0.95	1.00		0.95	1.00	1.00		0.22	1.00		
Satd. Flow (perm)		1770	1823		1770	1863	1583		405	3213		
Peak-hour factor, PHF	0.48	0.98	0.54	0.25	0.74	0.60	0.67	0.83	0.25	0.66	0.83	0.59
Adj. Flow (vph)	56	333	48	8	80	183	93	36	4	324	484	32
RTOR Reduction (vph)	0	0	5	0	0	0	11	0	0	2	0	0
Lane Group Flow (vph)	0	389	51	0	80	183	118	0	4	838	0	0
Turn Type	Prot	Prot			Prot		Perm		Perm			
Protected Phases	7	7	4		3	8				2		
Permitted Phases							8		2			
Actuated Green, G (s)		26.0	30.0		12.0	16.0	16.0		66.0	66.0		
Effective Green, g (s)		26.0	30.0		12.0	16.0	16.0		66.0	66.0		
Actuated g/C Ratio		0.22	0.25		0.10	0.13	0.13		0.55	0.55		
Clearance Time (s)		4.0	4.0		4.0	4.0	4.0		4.0	4.0		
Lane Grp Cap (vph)		384	456		177	248	211		223	1767		
v/s Ratio Prot		c0.22	0.03		0.05	c0.10				0.26		
v/s Ratio Perm							0.07		0.01			
v/c Ratio		1.01	0.11		0.45	0.74	0.56		0.02	0.47		
Uniform Delay, d1		47.0	34.7		50.9	50.0	48.7		12.3	16.4		
Progression Factor		1.00	1.03		1.00	1.00	1.00		0.81	0.88		
Incremental Delay, d2		46.9	0.4		8.1	17.8	10.2		0.1	0.6		
Delay (s)		93.7	36.3		59.0	67.7	58.9		10.1	15.1		
Level of Service		F	D		E	E	E		B	B		
Approach Delay (s)			86.5			63.1				15.1		
Approach LOS			F			E				B		

Intersection Summary			
HCM Average Control Delay	40.7	HCM Level of Service	D
HCM Volume to Capacity ratio	0.99		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	68.4%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	SBL2	SBL	SBT	SBR
Lane Configurations				
Volume (vph)	151	36	678	106
Ideal Flow (vphpl)	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	
Lane Util. Factor		1.00	0.95	
Frt		1.00	0.98	
Flt Protected		0.95	1.00	
Satd. Flow (prot)		1770	3472	
Flt Permitted		0.27	1.00	
Satd. Flow (perm)		497	3472	
Peak-hour factor, PHF	0.64	0.75	0.80	0.86
Adj. Flow (vph)	236	48	848	123
RTOR Reduction (vph)	0	0	9	0
Lane Group Flow (vph)	0	284	962	0
Turn Type	Perm	Perm		
Protected Phases			6	
Permitted Phases	6	6		
Actuated Green, G (s)		66.0	66.0	
Effective Green, g (s)		66.0	66.0	
Actuated g/C Ratio		0.55	0.55	
Clearance Time (s)		4.0	4.0	
Lane Grp Cap (vph)		273	1910	
v/s Ratio Prot			0.28	
v/s Ratio Perm		c0.57		
v/c Ratio		1.04	0.50	
Uniform Delay, d1		27.0	16.8	
Progression Factor		1.00	1.00	
Incremental Delay, d2		65.4	1.0	
Delay (s)		92.4	17.8	
Level of Service		F	B	
Approach Delay (s)			34.6	
Approach LOS			C	

Intersection Summary

Movement	EBL	EBT	EBR	EBR2	WBL2	WBL	WBT	WBR	NBL2	NBL	NBT	NBR
Lane Configurations												
Volume (vph)	3	186	26	28	10	55	106	20	222	17	642	63
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0		4.0		4.0	4.0			4.0	4.0	
Lane Util. Factor		1.00		1.00		1.00	1.00			1.00	0.95	
Frt		0.98		0.85		1.00	0.97			1.00	0.99	
Flt Protected		1.00		1.00		0.95	1.00			0.95	1.00	
Satd. Flow (prot)		1816		1583		1770	1799			1770	3488	
Flt Permitted		0.99		1.00		0.48	1.00			0.26	1.00	
Satd. Flow (perm)		1802		1583		901	1799			493	3488	
Peak-hour factor, PHF	0.38	0.91	0.65	0.44	0.63	0.72	0.86	0.56	0.73	0.61	0.91	0.83
Adj. Flow (vph)	8	204	40	64	16	76	123	36	304	28	705	76
RTOR Reduction (vph)	0	0	0	47	0	0	18	0	0	0	14	0
Lane Group Flow (vph)	0	252	0	17	0	92	141	0	0	332	767	0
Turn Type	Perm			Perm	Perm	Perm			Perm	Perm		
Protected Phases		4					8				2	
Permitted Phases	4			4	8	8			2	2		
Actuated Green, G (s)		16.0		16.0		16.0	16.0			36.0	36.0	
Effective Green, g (s)		16.0		16.0		16.0	16.0			36.0	36.0	
Actuated g/C Ratio		0.27		0.27		0.27	0.27			0.60	0.60	
Clearance Time (s)		4.0		4.0		4.0	4.0			4.0	4.0	
Lane Grp Cap (vph)		481		422		240	480			296	2093	
v/s Ratio Prot							0.08				0.22	
v/s Ratio Perm		c0.14		0.01		0.10				c0.67		
v/c Ratio		0.52		0.04		0.38	0.29			1.12	0.37	
Uniform Delay, d1		18.8		16.3		18.0	17.5			12.0	6.2	
Progression Factor		1.00		1.00		1.00	1.00			1.00	1.00	
Incremental Delay, d2		4.0		0.2		4.6	1.6			89.2	0.5	
Delay (s)		22.8		16.5		22.6	19.1			101.2	6.7	
Level of Service		C		B		C	B			F	A	
Approach Delay (s)		21.5					20.3				34.8	
Approach LOS		C					C				C	

Intersection Summary			
HCM Average Control Delay	21.6	HCM Level of Service	C
HCM Volume to Capacity ratio	0.94		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	69.2%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	SBL	SBT	SBR	SBR2
Lane Configurations				
Volume (vph)	209	451	351	17
Ideal Flow (vphpl)	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		
Lane Util. Factor	1.00	0.95		
Frt	1.00	0.93		
Flt Protected	0.95	1.00		
Satd. Flow (prot)	1770	3300		
Flt Permitted	0.33	1.00		
Satd. Flow (perm)	606	3300		
Peak-hour factor, PHF	0.90	0.88	0.88	0.85
Adj. Flow (vph)	232	512	399	20
RTOR Reduction (vph)	0	2	0	0
Lane Group Flow (vph)	232	929	0	0
Turn Type	Perm			
Protected Phases		6		
Permitted Phases	6			
Actuated Green, G (s)	36.0	36.0		
Effective Green, g (s)	36.0	36.0		
Actuated g/C Ratio	0.60	0.60		
Clearance Time (s)	4.0	4.0		
Lane Grp Cap (vph)	364	1980		
v/s Ratio Prot		0.28		
v/s Ratio Perm	0.38			
v/c Ratio	0.64	0.47		
Uniform Delay, d1	7.8	6.7		
Progression Factor	1.00	1.00		
Incremental Delay, d2	8.3	0.8		
Delay (s)	16.0	7.5		
Level of Service	B	A		
Approach Delay (s)		9.2		
Approach LOS		A		

Intersection Summary

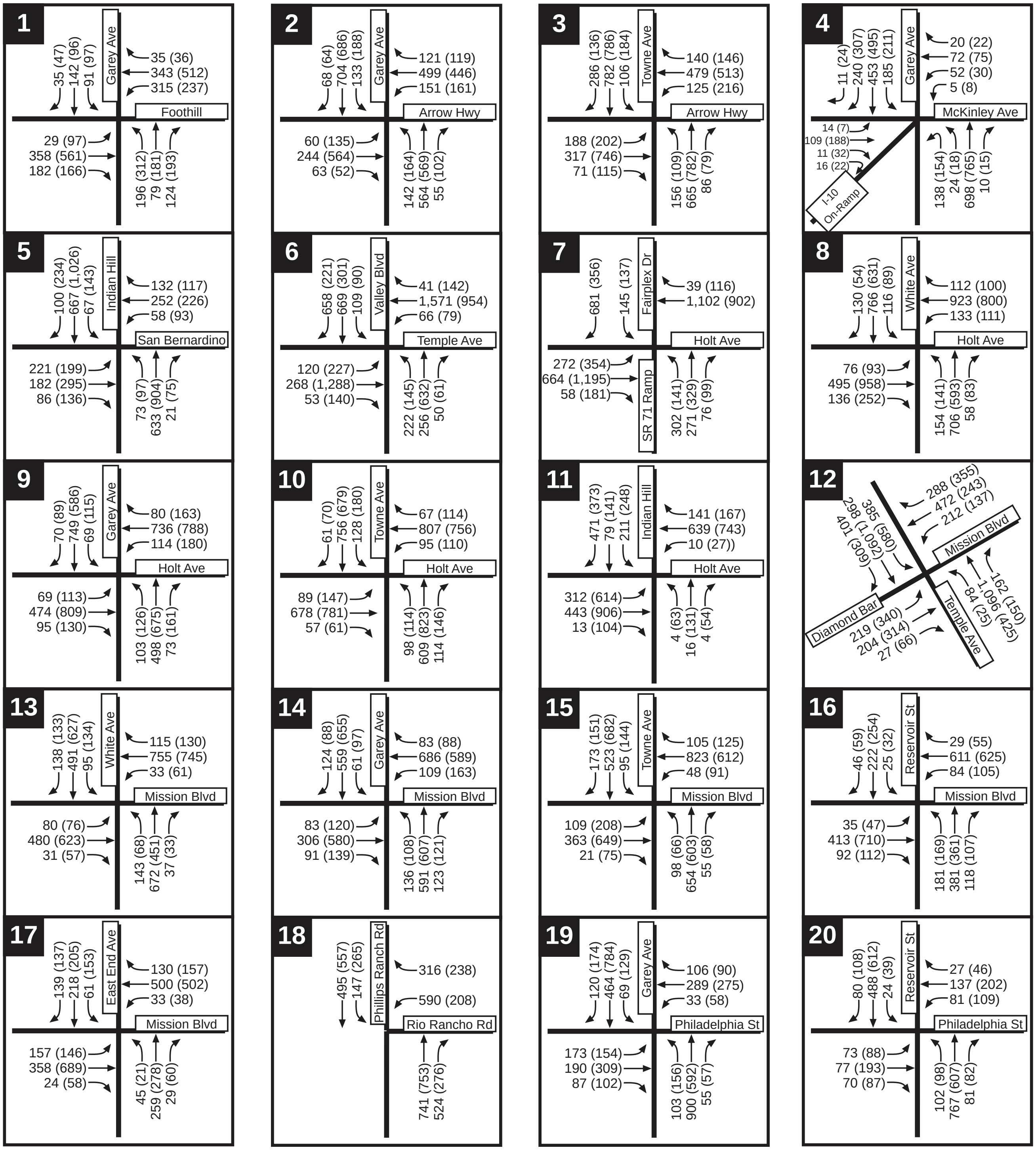
Movement	EBL2	EBL	EBT	EBR	WBL	WBT	WBR	WBR2	NBL	NBT	NBR	NBR2
Lane Configurations												
Volume (vph)	22	374	62	11	32	62	25	22	1	178	599	28
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		4.0	4.0	4.0		4.0	4.0		
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00		1.00	0.95		
Frt		1.00	0.97		1.00	1.00	0.85		1.00	0.88		
Flt Protected		0.95	1.00		0.95	1.00	1.00		0.95	1.00		
Satd. Flow (prot)		1770	1816		1770	1863	1583		1770	3122		
Flt Permitted		0.95	1.00		0.95	1.00	1.00		0.31	1.00		
Satd. Flow (perm)		1770	1816		1770	1863	1583		570	3122		
Peak-hour factor, PHF	0.69	0.85	0.78	0.69	0.67	0.71	0.52	0.61	0.25	0.87	0.83	0.87
Adj. Flow (vph)	32	440	79	16	48	87	48	36	4	205	722	32
RTOR Reduction (vph)	0	0	7	0	0	0	25	0	0	2	0	0
Lane Group Flow (vph)	0	472	88	0	48	87	59	0	4	957	0	0
Turn Type	Prot	Prot			Prot		Perm		Perm			
Protected Phases	7	7	4		3	8				2		
Permitted Phases							8		2			
Actuated Green, G (s)		21.0	30.0		7.0	16.0	16.0		61.0	61.0		
Effective Green, g (s)		21.0	30.0		7.0	16.0	16.0		61.0	61.0		
Actuated g/C Ratio		0.19	0.27		0.06	0.15	0.15		0.55	0.55		
Clearance Time (s)		4.0	4.0		4.0	4.0	4.0		4.0	4.0		
Lane Grp Cap (vph)		338	495		113	271	230		316	1731		
v/s Ratio Prot		c0.27	0.05		0.03	c0.05				0.31		
v/s Ratio Perm							0.04		0.01			
v/c Ratio		1.40	0.18		0.42	0.32	0.26		0.01	0.86dr		
Uniform Delay, d1		44.5	30.6		49.6	42.1	41.7		11.0	15.7		
Progression Factor		1.00	1.00		1.00	1.00	1.00		1.00	1.00		
Incremental Delay, d2		195.5	0.8		11.3	3.1	2.7		0.1	1.3		
Delay (s)		240.0	31.4		60.8	45.2	44.4		11.1	17.0		
Level of Service		F	C		E	D	D		B	B		
Approach Delay (s)			205.1			48.3				17.0		
Approach LOS			F			D				B		

Intersection Summary			
HCM Average Control Delay	76.3	HCM Level of Service	E
HCM Volume to Capacity ratio	1.18		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	76.8%	ICU Level of Service	D
Analysis Period (min)	15		

dr Defacto Right Lane. Recode with 1 though lane as a right lane.
c Critical Lane Group

Movement	SBL2	SBL	SBT	SBR
Lane Configurations				
Volume (vph)	185	50	608	113
Ideal Flow (vphpl)	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	
Lane Util. Factor		1.00	0.95	
Frt		1.00	0.97	
Flt Protected		0.95	1.00	
Satd. Flow (prot)		1770	3449	
Flt Permitted		0.22	1.00	
Satd. Flow (perm)		418	3449	
Peak-hour factor, PHF	0.81	0.63	0.97	0.88
Adj. Flow (vph)	228	79	627	128
RTOR Reduction (vph)	0	0	16	0
Lane Group Flow (vph)	0	307	739	0
Turn Type	Perm	Perm		
Protected Phases			6	
Permitted Phases	6	6		
Actuated Green, G (s)		61.0	61.0	
Effective Green, g (s)		61.0	61.0	
Actuated g/C Ratio		0.55	0.55	
Clearance Time (s)		4.0	4.0	
Lane Grp Cap (vph)		232	1913	
v/s Ratio Prot			0.21	
v/s Ratio Perm		c0.73		
v/c Ratio		1.32	0.39	
Uniform Delay, d1		24.5	13.9	
Progression Factor		1.00	1.00	
Incremental Delay, d2		172.3	0.6	
Delay (s)		196.8	14.5	
Level of Service		F	B	
Approach Delay (s)			67.2	
Approach LOS			E	

Intersection Summary



LEGEND:

XX (YY) = AM (PM) Peak Hour

NORTH
NOT TO SCALE

Source: Fehr & Peers, January 2007.

EIP ASSOCIATES
A division of PBS&J

FIGURE **4.13-5**
Existing Peak Hour Traffic Volumes

D20829.00

Pomona General Plan Update

01153 | JCS | 07

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	246	622	59	0	936	75	266	203	100	156	0	657
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0		4.0	4.0			4.0	4.0
Lane Util. Factor	0.97	0.95			0.95		1.00	0.95			1.00	0.88
Frt	1.00	0.99			0.99		1.00	0.95			1.00	0.85
Flt Protected	0.95	1.00			1.00		0.95	1.00			0.95	1.00
Satd. Flow (prot)	3433	3493			3500		1770	3364			1770	2787
Flt Permitted	0.19	1.00			1.00		0.65	1.00			0.55	1.00
Satd. Flow (perm)	669	3493			3500		1210	3364			1029	2787
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)	267	676	64	0	1017	82	289	221	109	170	0	714
RTOR Reduction (vph)	0	13	0	0	11	0	0	73	0	0	0	100
Lane Group Flow (vph)	267	727	0	0	1088	0	289	257	0	0	170	614
Turn Type	Perm						Perm			Perm		Perm
Protected Phases		4			8			2			6	
Permitted Phases	4						2			6		6
Actuated Green, G (s)	29.0	29.0			29.0		18.0	18.0			18.0	18.0
Effective Green, g (s)	29.0	29.0			29.0		18.0	18.0			18.0	18.0
Actuated g/C Ratio	0.53	0.53			0.53		0.33	0.33			0.33	0.33
Clearance Time (s)	4.0	4.0			4.0		4.0	4.0			4.0	4.0
Lane Grp Cap (vph)	353	1842			1845		396	1101			337	912
v/s Ratio Prot		0.21			0.31			0.08				
v/s Ratio Perm	c0.40						c0.24				0.17	0.22
v/c Ratio	0.76	0.39			0.59		0.73	0.23			0.50	0.67
Uniform Delay, d1	10.2	7.8			8.9		16.4	13.5			14.9	16.0
Progression Factor	1.00	1.00			0.13		1.00	1.00			1.00	1.00
Incremental Delay, d2	14.0	0.6			1.2		11.2	0.5			5.3	4.0
Delay (s)	24.3	8.4			2.3		27.6	14.0			20.2	19.9
Level of Service	C	A			A		C	B			C	B
Approach Delay (s)		12.6			2.3			20.3			20.0	
Approach LOS		B			A			C			B	

Intersection Summary			
HCM Average Control Delay	12.6	HCM Level of Service	B
HCM Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	55.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	76.0%	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)	439	1606	182	0	801	123	93	293	101	214	0	392
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0		4.0	4.0			4.0	4.0
Lane Util. Factor	0.97	0.95			0.95		1.00	0.95			1.00	0.88
Frt	1.00	0.98			0.98		1.00	0.96			1.00	0.85
Flt Protected	0.95	1.00			1.00		0.95	1.00			0.95	1.00
Satd. Flow (prot)	3433	3459			3467		1770	3381			1770	2787
Flt Permitted	0.20	1.00			1.00		0.48	1.00			0.43	1.00
Satd. Flow (perm)	708	3459			3467		898	3381			799	2787
Peak-hour factor, PHF	0.88	0.96	0.61	0.92	0.83	0.81	0.89	0.95	0.77	0.82	0.92	0.90
Adj. Flow (vph)	499	1673	298	0	965	152	104	308	131	261	0	436
RTOR Reduction (vph)	0	24	0	0	21	0	0	16	0	0	0	155
Lane Group Flow (vph)	499	1947	0	0	1096	0	104	423	0	0	261	281
Turn Type	Perm						Perm			Perm		Perm
Protected Phases		4			8			2			6	
Permitted Phases	4						2			6		6
Actuated Green, G (s)	35.0	35.0			35.0		17.0	17.0			17.0	17.0
Effective Green, g (s)	35.0	35.0			35.0		17.0	17.0			17.0	17.0
Actuated g/C Ratio	0.58	0.58			0.58		0.28	0.28			0.28	0.28
Clearance Time (s)	4.0	4.0			4.0		4.0	4.0			4.0	4.0
Lane Grp Cap (vph)	413	2018			2022		254	958			226	790
v/s Ratio Prot		0.56			0.32			0.13				
v/s Ratio Perm	c0.71						0.12				c0.33	0.10
v/c Ratio	1.21	0.96			0.54		0.41	0.44			1.15	0.36
Uniform Delay, d1	12.5	11.9			7.6		17.4	17.6			21.5	17.1
Progression Factor	1.00	1.00			0.75		1.00	1.00			1.00	1.00
Incremental Delay, d2	114.4	13.3			1.0		4.8	1.5			108.0	1.3
Delay (s)	126.9	25.2			6.7		22.3	19.1			129.5	18.4
Level of Service	F	C			A		C	B			F	B
Approach Delay (s)		45.7			6.7			19.7			60.0	
Approach LOS		D			A			B			E	

Intersection Summary			
HCM Average Control Delay	35.8	HCM Level of Service	D
HCM Volume to Capacity ratio	1.19		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	83.4%	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)	83	374	97	94	595	92	100	524	60	109	719	51
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.97		1.00	0.98		1.00	0.99		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3418		1770	3464		1770	3488		1770	3498	
Flt Permitted	0.28	1.00		0.43	1.00		0.25	1.00		0.35	1.00	
Satd. Flow (perm)	527	3418		808	3464		466	3488		659	3498	
Peak-hour factor, PHF	0.74	0.89	0.78	0.87	0.88	0.82	0.74	0.87	0.94	0.74	0.90	0.75
Adj. Flow (vph)	112	420	124	108	676	112	135	602	64	147	799	68
RTOR Reduction (vph)	0	46	0	0	33	0	0	20	0	0	16	0
Lane Group Flow (vph)	112	498	0	108	755	0	135	646	0	147	851	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	16.0	16.0		16.0	16.0		16.0	16.0		16.0	16.0	
Effective Green, g (s)	16.0	16.0		16.0	16.0		16.0	16.0		16.0	16.0	
Actuated g/C Ratio	0.40	0.40		0.40	0.40		0.40	0.40		0.40	0.40	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Grp Cap (vph)	211	1367		323	1386		186	1395		264	1399	
v/s Ratio Prot		0.15			c0.22			0.19			0.24	
v/s Ratio Perm	0.21			0.13			c0.29			0.22		
v/c Ratio	0.53	0.36		0.33	0.54		0.73	0.46		0.56	0.61	
Uniform Delay, d1	9.1	8.4		8.3	9.2		10.1	8.8		9.3	9.5	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		0.08	0.05	
Incremental Delay, d2	9.2	0.8		2.8	1.5		21.8	1.1		6.0	1.4	
Delay (s)	18.4	9.2		11.1	10.7		31.9	9.9		6.8	1.9	
Level of Service	B	A		B	B		C	A		A	A	
Approach Delay (s)		10.8			10.8			13.6			2.6	
Approach LOS		B			B			B			A	

Intersection Summary			
HCM Average Control Delay	9.0	HCM Level of Service	A
HCM Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	40.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	64.4%	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	737	178	160	584	136	109	731	137	92	642	58
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.97		1.00	0.97		1.00	0.97		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3428		1770	3435		1770	3445		1770	3484	
Flt Permitted	0.28	1.00		0.25	1.00		0.29	1.00		0.25	1.00	
Satd. Flow (perm)	524	3428		466	3435		537	3445		466	3484	
Peak-hour factor, PHF	0.79	0.88	0.80	0.82	0.92	0.87	0.80	0.97	0.84	0.85	0.92	0.72
Adj. Flow (vph)	184	838	222	195	635	156	136	754	163	108	698	81
RTOR Reduction (vph)	0	59	0	0	53	0	0	40	0	0	22	0
Lane Group Flow (vph)	184	1001	0	195	738	0	136	877	0	108	757	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	16.0	16.0		16.0	16.0		16.0	16.0		16.0	16.0	
Effective Green, g (s)	16.0	16.0		16.0	16.0		16.0	16.0		16.0	16.0	
Actuated g/C Ratio	0.40	0.40		0.40	0.40		0.40	0.40		0.40	0.40	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Grp Cap (vph)	210	1371		186	1374		215	1378		186	1394	
v/s Ratio Prot		0.29			0.21			c0.25			0.22	
v/s Ratio Perm	0.35			c0.42			0.25			0.23		
v/c Ratio	0.88	0.73		1.05	0.54		0.63	0.64		0.58	0.54	
Uniform Delay, d1	11.1	10.2		12.0	9.2		9.6	9.7		9.4	9.2	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.98	2.15	
Incremental Delay, d2	36.6	3.4		79.3	1.5		13.3	2.3		10.1	1.2	
Delay (s)	47.7	13.6		91.3	10.7		23.0	11.9		28.6	21.0	
Level of Service	D	B		F	B		C	B		C	C	
Approach Delay (s)		18.7			26.6			13.3			21.9	
Approach LOS		B			C			B			C	

Intersection Summary			
HCM Average Control Delay	19.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	40.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	77.9%	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)	47	340	59	59	556	90	97	528	50	129	743	77
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.98		1.00	0.98		1.00	0.99		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3454		1770	3460		1770	3489		1770	3496	
Flt Permitted	0.28	1.00		0.44	1.00		0.21	1.00		0.37	1.00	
Satd. Flow (perm)	519	3454		818	3460		395	3489		686	3496	
Peak-hour factor, PHF	0.84	0.86	0.78	0.74	0.95	0.87	0.76	0.87	0.78	0.77	0.79	0.92
Adj. Flow (vph)	56	395	76	80	585	103	128	607	64	168	941	84
RTOR Reduction (vph)	0	32	0	0	29	0	0	16	0	0	13	0
Lane Group Flow (vph)	56	439	0	80	659	0	128	655	0	168	1012	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	16.0	16.0		16.0	16.0		26.0	26.0		26.0	26.0	
Effective Green, g (s)	16.0	16.0		16.0	16.0		26.0	26.0		26.0	26.0	
Actuated g/C Ratio	0.32	0.32		0.32	0.32		0.52	0.52		0.52	0.52	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Grp Cap (vph)	166	1105		262	1107		205	1814		357	1818	
v/s Ratio Prot		0.13			c0.19			0.19			0.29	
v/s Ratio Perm	0.11			0.10			c0.32			0.24		
v/c Ratio	0.34	0.40		0.31	0.60		0.62	0.36		0.47	0.56	
Uniform Delay, d1	13.0	13.2		12.8	14.3		8.5	7.1		7.6	8.1	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	5.4	1.1		3.0	2.4		13.5	0.6		4.4	1.2	
Delay (s)	18.4	14.3		15.8	16.6		22.0	7.7		12.0	9.3	
Level of Service	B	B		B	B		C	A		B	A	
Approach Delay (s)		14.7			16.6			10.0			9.7	
Approach LOS		B			B			A			A	

Intersection Summary			
HCM Average Control Delay	12.2	HCM Level of Service	B
HCM Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	63.3%	ICU Level of Service	B
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)	140	726	94	72	646	118	100	756	83	131	637	80
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.98		1.00	0.98		1.00	0.99		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3477		1770	3456		1770	3490		1770	3475	
Flt Permitted	0.21	1.00		0.20	1.00		0.28	1.00		0.22	1.00	
Satd. Flow (perm)	399	3477		373	3456		527	3490		416	3475	
Peak-hour factor, PHF	0.90	0.86	0.84	0.86	0.86	0.84	0.71	0.91	0.99	0.80	0.92	0.83
Adj. Flow (vph)	156	844	112	84	751	140	141	831	84	164	692	96
RTOR Reduction (vph)	0	20	0	0	31	0	0	15	0	0	22	0
Lane Group Flow (vph)	156	936	0	84	860	0	141	900	0	164	766	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	20.0	20.0		20.0	20.0		22.0	22.0		22.0	22.0	
Effective Green, g (s)	20.0	20.0		20.0	20.0		22.0	22.0		22.0	22.0	
Actuated g/C Ratio	0.40	0.40		0.40	0.40		0.44	0.44		0.44	0.44	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Grp Cap (vph)	160	1391		149	1382		232	1536		183	1529	
v/s Ratio Prot		0.27			0.25			0.26			0.22	
v/s Ratio Perm	c0.39			0.23			0.27			c0.39		
v/c Ratio	0.98	0.67		0.56	0.62		0.61	0.59		0.90	0.50	
Uniform Delay, d1	14.8	12.3		11.6	12.0		10.7	10.6		12.9	10.1	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	64.9	2.6		14.5	2.1		11.3	1.6		43.8	1.2	
Delay (s)	79.6	14.9		26.2	14.1		22.0	12.2		56.8	11.2	
Level of Service	E	B		C	B		C	B		E	B	
Approach Delay (s)		24.0			15.1			13.5			19.1	
Approach LOS		C			B			B			B	

Intersection Summary			
HCM Average Control Delay	18.0	HCM Level of Service	B
HCM Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	73.5%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

ITM Peak Hour Summary

Prepared by:

National Data & Surveying Services

Reservoir St and Holt Blvd , City of Pomona

Date: 5/30/2012

Day: Wednesday

Project #: CA12_5220_001

N

Reservoir St

Holt Blvd

Peak Hour Summary

AM Peak Hour	730 AM
NOON Peak Hour	
PM Peak Hour	415 PM

CONTROL: Signalized

Southbound Approach

	Right	Through	Left	Departing (out)
Lanes	0	1	0	
AM	1	3	0	14
NOON	0	0	0	0
PM	2	6	1	13

Eastbound Approach

	AM	NOON	PM
Departing (out)	674	0	899

Lanes	Movement	AM	NOON	PM
1	Left	4	0	3
2	Through	474	0	887
0	Right	121	0	134

Westbound Approach

Movement	AM	NOON	PM	Lanes
Right	1	0	2	0
Through	485	0	710	2
Left	141	0	157	1

	AM	NOON	PM
Departing (out)	627	0	1123

Northbound Approach

	Departing (out)	Left	Through	Right
AM	265	188	9	153
NOON	0	0	0	0
PM	297	187	8	235
Lanes		1	0	1

Count Periods	Start	End
AM	7:00 AM	9:00 AM
NOON		
PM	4:00 PM	6:00 PM

Total Ins & Outs

Leg	Period	In	Out
North Leg	AM	4	14
North Leg	NOON	0	0
North Leg	PM	9	13
East Leg	AM	627	627
East Leg	NOON	0	0
East Leg	PM	869	1123
West Leg	AM	599	674
West Leg	NOON	0	0
West Leg	PM	1024	899
South Leg	AM	350	265
South Leg	NOON	0	0
South Leg	PM	430	297

Total Volume Per Leg

Leg	AM	NOON	PM
North Leg	18	0	22
East Leg	1254	0	1992
West Leg	1273	0	1923
South Leg	615	0	727

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: CA12_5220_001 **Day:** WEDNESDAY

City: City of Pomona **Date:** 05/30/2012

AM

NS/EW Streets:	Reservoir St			Reservoir St			Holt Blvd			Holt Blvd			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	1	0	1	0	1	0	1	2	0	1	2	0	
7:00 AM	36	1	12	1	1	0	0	65	16	14	88	1	235
7:15 AM	33	4	20	0	3	0	0	81	30	29	95	0	295
7:30 AM	59	4	36	0	0	0	1	103	32	43	148	0	426
7:45 AM	53	4	42	0	3	0	1	127	29	47	121	1	428
8:00 AM	39	1	48	0	0	0	0	126	31	21	114	0	380
8:15 AM	37	0	27	0	0	1	2	118	29	30	102	0	346
8:30 AM	24	2	31	0	1	1	2	100	30	21	114	0	326
8:45 AM	42	1	28	1	1	0	0	126	19	23	115	1	357

	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	323	17	244	2	9	2	6	846	216	228	897	3	2793
APPROACH %'s :	55.31%	2.91%	41.78%	15.38%	69.23%	15.38%	0.56%	79.21%	20.22%	20.21%	79.52%	0.27%	

PEAK HR START TIME :	730 AM												TOTAL
PEAK HR VOL :	188	9	153	0	3	1	4	474	121	141	485	1	1580
PEAK HR FACTOR :		0.884			0.333			0.954			0.821		0.923

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: CA12_5220_001 **Day:** WEDNESDAY

City: City of Pomona **Date:** 05/30/2012

PM

NS/EW Streets:	Reservoir St			Reservoir St			Holt Blvd			Holt Blvd			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	1	0	1	0	1	0	1	2	0	1	2	0	
4:00 PM	47	1	49	1	0	3	2	193	27	23	181	1	528
4:15 PM	44	1	56	0	0	1	0	229	36	36	177	1	581
4:30 PM	56	1	62	1	0	1	1	190	34	46	166	0	558
4:45 PM	44	3	59	0	2	0	2	223	27	39	195	1	595
5:00 PM	43	3	58	0	4	0	0	245	37	36	172	0	598
5:15 PM	54	1	68	0	0	2	0	182	24	40	164	1	536
5:30 PM	41	1	42	0	0	0	0	243	31	41	139	0	538
5:45 PM	33	2	41	0	1	0	0	195	46	33	177	0	528
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	362	13	435	2	7	7	5	1700	262	294	1371	4	4462
APPROACH %'s :	44.69%	1.60%	53.70%	12.50%	43.75%	43.75%	0.25%	86.43%	13.32%	17.62%	82.14%	0.24%	
PEAK HR START TIME :	415 PM												TOTAL
PEAK HR VOL :	187	8	235	1	6	2	3	887	134	157	710	2	2332
PEAK HR FACTOR :		0.903			0.563			0.908			0.924		0.975

CONTROL : Signalized

ITM Peak Hour Summary

Prepared by:

National Data & Surveying Services

Humane Way and Roselawn Ave , City of Pomona

Date: 5/30/2012

Day: Wednesday

Project #: CA12_5220_002

AM Peak Hour	715 AM
NOON Peak Hour	
PM Peak Hour	500 PM

Peak Hour Summary

Humane Way

Roselawn Ave

Southbound Approach

Lanes	0	1	1	
AM	0	250	195	373
NOON	0	0	0	0
PM	0	936	26	398

Eastbound Approach

Lanes	AM	NOON	PM
	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0

CONTROL

1-Way Stop (WB)

Westbound Approach

AM	NOON	PM	Lanes
43	0	235	0
0	0	0	1
36	0	209	0
431	0	59	

Northbound Approach

AM	286	0	330	236	AM
NOON	0	0	0	0	NOON
PM	1145	0	163	33	PM
		0	1	0	Lanes

Count Periods	Start	End
AM	7:00 AM	9:00 AM
NOON		
PM	4:00 PM	6:00 PM

Total Ins & Outs

North Leg

445	373	AM
0	0	NOON
962	398	PM

East Leg

AM	NOON	PM
79	0	444
431	0	59

West Leg

AM	NOON	PM
0	0	0
0	0	0

South Leg

AM	286	566
NOON	0	0
PM	1145	196

Total Volume Per Leg

North Leg

818	AM
0	NOON
1360	PM

East Leg

AM	NOON	PM
510	0	503

West Leg

AM	NOON	PM
0	0	0

South Leg

AM	852
NOON	0
PM	1341

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: CA12_5220_002 | **Day:** WEDNESDAY

City: City of Pomona | **Date:** 05/30/2012

AM

NS/EW Streets:	Humane Way			Humane Way			Roselawn Ave			Roselawn Ave			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	0	1	0	1	1	0	0	0	0	0	1	0	
7:00 AM		24	38	30	32					8		7	139
7:15 AM		68	54	32	40					7		8	209
7:30 AM		114	72	53	71					9		17	336
7:45 AM		99	66	73	81					11		12	342
8:00 AM		49	44	37	58					9		6	203
8:15 AM		42	35	43	39					7		14	180
8:30 AM		39	35	23	35					22		13	167
8:45 AM		32	35	31	39					10		13	160

	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	0	467	379	322	395	0	0	0	0	83	0	90	1736
APPROACH %'s :	0.00%	55.20%	44.80%	44.91%	55.09%	0.00%	#DIV/0!	#DIV/0!	#DIV/0!	47.98%	0.00%	52.02%	

PEAK HR START TIME :	715 AM												TOTAL
PEAK HR VOL :	0	330	236	195	250	0	0	0	0	36	0	43	1090
PEAK HR FACTOR :		0.761			0.722			0.000			0.760		0.797

CONTROL : 1-Way Stop (WB)

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: CA12_5220_002 **Day:** WEDNESDAY

City: City of Pomona **Date:** 05/30/2012

PM

NS/EW Streets:	Humane Way			Humane Way			Roselawn Ave			Roselawn Ave			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	0	1	0	1	1	0	0	0	0	0	1	0	
4:00 PM		67	13	21	104					51		56	312
4:15 PM		35	16	12	104					40		56	263
4:30 PM		52	8	6	132					75		86	359
4:45 PM		42	12	11	107					61		56	289
5:00 PM		38	13	7	177					81		95	411
5:15 PM		38	9	8	255					45		58	413
5:30 PM		41	4	6	275					44		57	427
5:45 PM		46	7	5	229					39		25	351

	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	0	359	82	76	1383	0	0	0	0	436	0	489	2825
APPROACH %'s :	0.00%	81.41%	18.59%	5.21%	94.79%	0.00%	#DIV/0!	#DIV/0!	#DIV/0!	47.14%	0.00%	52.86%	

PEAK HR START TIME :	500 PM												TOTAL
PEAK HR VOL :	0	163	33	26	936	0	0	0	0	209	0	235	1602
PEAK HR FACTOR :		0.925			0.856			0.000			0.631		0.938

CONTROL : 1-Way Stop (WB)

ITM Peak Hour Summary

Prepared by:

NDS

National Data & Surveying Services

Roselawn Ave and Pomona Blvd , City of Pomona

Date: 5/30/2012
Day: Wednesday

Project #: CA12_5220_003

N

Roselawn Ave

Pomona Blvd

AM Peak Hour	730 AM
NOON Peak Hour	
PM Peak Hour	415 PM

Peak Hour Summary

Southbound Approach

	Lanes 0	0	0	
AM	0	0	0	0 AM
NOON	0	0	0	0 NOON
PM	0	0	0	0 PM

Eastbound Approach

	AM	NOON	PM
	369	0	93

Lanes	AM	NOON	PM
0	0	0	0
1	10	0	23
1	76	0	473

Westbound Approach

AM	NOON	PM	Lanes
0	0	0	0
4	0	21	2
8	0	73	0

AM	NOON	PM
65	0	35

CONTROL

1-Way Stop (NB)

Northbound Approach

AM	84	365	0	55	AM
NOON	0	0	0	0	NOON
PM	546	72	0	12	PM
		0	1	0	Lanes

Count Periods	Start	End
AM	7:00 AM	9:00 AM
NOON		
PM	4:00 PM	6:00 PM

Total Ins & Outs

North Leg

AM	0	0	
NOON	0	0	
PM	0	0	

West Leg

AM	NOON	PM
369	0	93
86	0	496

East Leg

AM	NOON	PM
12	0	94
65	0	35

South Leg

AM	84	420
NOON	0	0
PM	546	84

Total Volume Per Leg

North Leg

AM	0
NOON	0
PM	0

West Leg

AM	NOON	PM
455	0	589

East Leg

AM	NOON	PM
77	0	129

South Leg

AM	504
NOON	0
PM	630

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: CA12_5220_003 **Day:** WEDNESDAY

City: City of Pomona **Date:** 05/30/2012

AM

NS/EW Streets:	Roselawn Ave			Roselawn Ave			Pomona Blvd			Pomona Blvd			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	0	1	0	0	0	0	0	1	1	0	2	0	
7:00 AM	67		0					0	14	2	0		83
7:15 AM	79		3					1	15	1	0		99
7:30 AM	117		9					1	22	3	0		152
7:45 AM	121		15					2	21	1	1		161
8:00 AM	69		10					4	13	2	3		101
8:15 AM	58		21					3	20	2	0		104
8:30 AM	36		22					3	30	4	1		96
8:45 AM	60		5					2	24	1	1		93

	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	607	0	85	0	0	0	0	16	159	16	6	0	889
APPROACH %'s :	87.72%	0.00%	12.28%	#DIV/0!	#DIV/0!	#DIV/0!	0.00%	9.14%	90.86%	72.73%	27.27%	0.00%	

PEAK HR START TIME :	730 AM												TOTAL
PEAK HR VOL :	365	0	55	0	0	0	0	10	76	8	4	0	518
PEAK HR FACTOR :		0.772			0.000			0.935			0.600		0.804

CONTROL : 1-Way Stop (NB)

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: CA12_5220_003 **Day:** WEDNESDAY

City: City of Pomona **Date:** 05/30/2012

PM

NS/EW Streets:	Roselawn Ave			Roselawn Ave			Pomona Blvd			Pomona Blvd			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	0	1	0	0	0	0	0	1	1	0	2	0	
4:00 PM	31		5					4	98	8	4		150
4:15 PM	21		4					5	80	14	4		128
4:30 PM	14		2					4	163	9	4		196
4:45 PM	22		2					12	96	12	2		146
5:00 PM	15		4					2	134	38	11		204
5:15 PM	14		2					3	81	24	3		127
5:30 PM	11		1					7	93	9	4		125
5:45 PM	12		0					1	62	5	2		82

	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	140	0	20	0	0	0	0	38	807	119	34	0	1158
APPROACH %'s :	87.50%	0.00%	12.50%	#DIV/0!	#DIV/0!	#DIV/0!	0.00%	4.50%	95.50%	77.78%	22.22%	0.00%	

PEAK HR START TIME :	415 PM												TOTAL
PEAK HR VOL :	72	0	12	0	0	0	0	23	473	73	21	0	674
PEAK HR FACTOR :		0.840			0.000			0.743			0.480		0.826

CONTROL : 1-Way Stop (NB)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	67	448	75	34	482	105	107	643	31	90	465	98
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.98		1.00	0.97		1.00	0.99		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3455		1770	3446		1770	3500		1770	3442	
Flt Permitted	0.31	1.00		0.28	1.00		0.36	1.00		0.31	1.00	
Satd. Flow (perm)	569	3455		529	3446		664	3500		584	3442	
Peak-hour factor, PHF	0.76	0.77	0.69	0.57	0.89	0.91	0.76	0.91	0.55	0.70	0.84	0.79
Adj. Flow (vph)	88	582	109	60	542	115	141	707	56	129	554	124
RTOR Reduction (vph)	0	28	0	0	33	0	0	11	0	0	35	0
Lane Group Flow (vph)	88	663	0	60	624	0	141	752	0	129	643	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	19.0	19.0		19.0	19.0		28.0	28.0		28.0	28.0	
Effective Green, g (s)	19.0	19.0		19.0	19.0		28.0	28.0		28.0	28.0	
Actuated g/C Ratio	0.35	0.35		0.35	0.35		0.51	0.51		0.51	0.51	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Grp Cap (vph)	197	1194		183	1190		338	1782		297	1752	
v/s Ratio Prot		c0.19			0.18			0.21			0.19	
v/s Ratio Perm	0.15			0.11			0.21			c0.22		
v/c Ratio	0.45	0.56		0.33	0.52		0.42	0.42		0.43	0.37	
Uniform Delay, d1	13.9	14.6		13.3	14.4		8.4	8.4		8.5	8.2	
Progression Factor	0.67	0.64		0.77	0.71		1.00	1.00		0.71	0.58	
Incremental Delay, d2	6.9	1.8		4.1	1.4		3.8	0.7		4.2	0.5	
Delay (s)	16.3	11.1		14.3	11.6		12.2	9.2		10.2	5.3	
Level of Service	B	B		B	B		B	A		B	A	
Approach Delay (s)		11.7			11.9			9.6			6.1	
Approach LOS		B			B			A			A	

Intersection Summary			
HCM Average Control Delay	9.7	HCM Level of Service	A
HCM Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	55.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	57.5%	ICU Level of Service	B
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)	67	498	40	44	621	86	59	362	20	78	493	89
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.98		1.00	0.98		1.00	0.99		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3480		1770	3472		1770	3504		1770	3455	
Flt Permitted	0.28	1.00		0.38	1.00		0.31	1.00		0.49	1.00	
Satd. Flow (perm)	525	3480		706	3472		574	3504		908	3455	
Peak-hour factor, PHF	0.73	0.92	0.59	0.85	0.90	0.86	0.82	0.91	0.71	0.81	0.84	0.80
Adj. Flow (vph)	92	541	68	52	690	100	72	398	28	96	587	111
RTOR Reduction (vph)	0	17	0	0	21	0	0	10	0	0	28	0
Lane Group Flow (vph)	92	592	0	52	769	0	72	416	0	96	670	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	25.0	25.0		25.0	25.0		22.0	22.0		22.0	22.0	
Effective Green, g (s)	25.0	25.0		25.0	25.0		22.0	22.0		22.0	22.0	
Actuated g/C Ratio	0.45	0.45		0.45	0.45		0.40	0.40		0.40	0.40	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Grp Cap (vph)	239	1582		321	1578		230	1402		363	1382	
v/s Ratio Prot		0.17			c0.22			0.12			c0.19	
v/s Ratio Perm	0.18			0.07			0.13			0.11		
v/c Ratio	0.38	0.37		0.16	0.49		0.31	0.30		0.26	0.48	
Uniform Delay, d1	9.9	9.9		8.8	10.5		11.3	11.2		11.1	12.3	
Progression Factor	0.64	0.55		0.60	0.59		1.00	1.00		1.00	1.00	
Incremental Delay, d2	4.4	0.6		1.0	1.0		3.5	0.5		1.8	1.2	
Delay (s)	10.8	6.1		6.3	7.2		14.8	11.8		12.8	13.5	
Level of Service	B	A		A	A		B	B		B	B	
Approach Delay (s)		6.7			7.1			12.2			13.4	
Approach LOS		A			A			B			B	

Intersection Summary			
HCM Average Control Delay	9.7	HCM Level of Service	A
HCM Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	55.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	56.8%	ICU Level of Service	B
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)	78	339	115	96	507	94	141	577	139	53	497	121
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95	1.00	1.00	0.95	
Frt	1.00	0.96		1.00	0.97		1.00	1.00	0.85	1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3414		1770	3449		1770	3539	1583	1770	3431	
Flt Permitted	0.28	1.00		0.34	1.00		0.36	1.00	1.00	0.35	1.00	
Satd. Flow (perm)	526	3414		641	3449		673	3539	1583	659	3431	
Peak-hour factor, PHF	0.85	0.71	0.78	0.69	0.84	0.76	0.80	0.87	0.77	0.74	0.96	0.92
Adj. Flow (vph)	92	477	147	139	604	124	176	663	181	72	518	132
RTOR Reduction (vph)	0	53	0	0	32	0	0	0	95	0	41	0
Lane Group Flow (vph)	92	571	0	139	696	0	176	663	86	72	609	0
Turn Type	Perm			Perm			Perm		Perm	Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		
Actuated Green, G (s)	21.0	21.0		21.0	21.0		26.0	26.0	26.0	26.0	26.0	
Effective Green, g (s)	21.0	21.0		21.0	21.0		26.0	26.0	26.0	26.0	26.0	
Actuated g/C Ratio	0.38	0.38		0.38	0.38		0.47	0.47	0.47	0.47	0.47	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Grp Cap (vph)	201	1304		245	1317		318	1673	748	312	1622	
v/s Ratio Prot		0.17			0.20			0.19			0.18	
v/s Ratio Perm	0.17			c0.22			c0.26		0.05	0.11		
v/c Ratio	0.46	0.44		0.57	0.53		0.55	0.40	0.11	0.23	0.38	
Uniform Delay, d1	12.7	12.6		13.4	13.2		10.4	9.4	8.1	8.6	9.3	
Progression Factor	0.45	0.42		0.31	0.23		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	6.3	0.9		8.0	1.3		6.8	0.7	0.3	1.7	0.7	
Delay (s)	12.0	6.2		12.2	4.4		17.1	10.1	8.4	10.3	10.0	
Level of Service	B	A		B	A		B	B	A	B	A	
Approach Delay (s)		7.0			5.7			11.0			10.0	
Approach LOS		A			A			B			A	

Intersection Summary			
HCM Average Control Delay	8.5	HCM Level of Service	A
HCM Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	55.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	60.1%	ICU Level of Service	B
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)	115	474	165	153	484	84	106	667	131	95	669	91
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95	1.00	1.00	0.95	
Frt	1.00	0.96		1.00	0.98		1.00	1.00	0.85	1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3383		1770	3453		1770	3539	1583	1770	3476	
Flt Permitted	0.37	1.00		0.28	1.00		0.24	1.00	1.00	0.27	1.00	
Satd. Flow (perm)	689	3383		521	3453		439	3539	1583	502	3476	
Peak-hour factor, PHF	0.76	0.86	0.72	0.91	0.94	0.84	0.95	0.85	0.94	0.88	0.89	0.90
Adj. Flow (vph)	151	551	229	168	515	100	112	785	139	108	752	101
RTOR Reduction (vph)	0	57	0	0	29	0	0	0	81	0	19	0
Lane Group Flow (vph)	151	723	0	168	586	0	112	785	58	108	834	0
Turn Type	Perm			Perm			Perm		Perm	Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		
Actuated Green, G (s)	24.0	24.0		24.0	24.0		23.0	23.0	23.0	23.0	23.0	
Effective Green, g (s)	24.0	24.0		24.0	24.0		23.0	23.0	23.0	23.0	23.0	
Actuated g/C Ratio	0.44	0.44		0.44	0.44		0.42	0.42	0.42	0.42	0.42	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Grp Cap (vph)	301	1476		227	1507		184	1480	662	210	1454	
v/s Ratio Prot		0.21			0.17			0.22			0.24	
v/s Ratio Perm	0.22			c0.32			c0.25		0.04	0.22		
v/c Ratio	0.50	0.49		0.74	0.39		0.61	0.53	0.09	0.51	0.57	
Uniform Delay, d1	11.2	11.1		12.9	10.5		12.5	12.0	9.7	11.9	12.2	
Progression Factor	0.67	0.58		0.41	0.23		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	5.7	1.1		17.9	0.7		14.1	1.4	0.3	8.7	1.7	
Delay (s)	13.3	7.6		23.2	3.2		26.6	13.3	9.9	20.6	13.9	
Level of Service	B	A		C	A		C	B	A	C	B	
Approach Delay (s)		8.5			7.5			14.3			14.6	
Approach LOS		A			A			B			B	

Intersection Summary			
HCM Average Control Delay	11.5	HCM Level of Service	B
HCM Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	55.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	67.5%	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)	83	296	24	55	613	101	92	619	60	67	431	106
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.99		1.00	0.98		1.00	0.98		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3495		1770	3457		1770	3465		1770	3444	
Flt Permitted	0.23	1.00		0.45	1.00		0.35	1.00		0.27	1.00	
Satd. Flow (perm)	429	3495		831	3457		656	3465		507	3444	
Peak-hour factor, PHF	0.90	0.68	0.60	0.63	0.88	0.79	0.56	0.87	0.52	0.76	0.79	0.88
Adj. Flow (vph)	92	435	40	87	697	128	164	711	115	88	546	120
RTOR Reduction (vph)	0	12	0	0	27	0	0	24	0	0	34	0
Lane Group Flow (vph)	92	463	0	87	798	0	164	802	0	88	632	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	21.0	21.0		21.0	21.0		26.0	26.0		26.0	26.0	
Effective Green, g (s)	21.0	21.0		21.0	21.0		26.0	26.0		26.0	26.0	
Actuated g/C Ratio	0.38	0.38		0.38	0.38		0.47	0.47		0.47	0.47	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Grp Cap (vph)	164	1334		317	1320		310	1638		240	1628	
v/s Ratio Prot		0.13			c0.23			0.23			0.18	
v/s Ratio Perm	0.21			0.10			c0.25			0.17		
v/c Ratio	0.56	0.35		0.27	0.60		0.53	0.49		0.37	0.39	
Uniform Delay, d1	13.4	12.1		11.7	13.7		10.2	9.9		9.2	9.4	
Progression Factor	0.46	0.41		0.31	0.29		1.00	1.00		1.00	1.00	
Incremental Delay, d2	12.8	0.7		2.0	1.9		6.3	1.1		4.3	0.7	
Delay (s)	18.9	5.6		5.6	5.8		16.5	11.0		13.5	10.1	
Level of Service	B	A		A	A		B	B		B	B	
Approach Delay (s)		7.8			5.8			11.9			10.5	
Approach LOS		A			A			B			B	

Intersection Summary			
HCM Average Control Delay	9.1	HCM Level of Service	A
HCM Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	55.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	60.8%	ICU Level of Service	B
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)	158	585	66	64	508	98	38	459	48	122	559	85
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.98		1.00	0.98		1.00	0.99		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3471		1770	3453		1770	3487		1770	3469	
Flt Permitted	0.34	1.00		0.32	1.00		0.31	1.00		0.38	1.00	
Satd. Flow (perm)	640	3471		602	3453		571	3487		712	3469	
Peak-hour factor, PHF	0.92	0.93	0.72	0.73	0.89	0.88	0.73	0.90	0.86	0.90	0.94	0.93
Growth Factor (vph)	100%	100%	100%	100%	100%	100%	100%	100%	100%	92%	100%	100%
Adj. Flow (vph)	172	629	92	88	571	111	52	510	56	125	595	91
RTOR Reduction (vph)	0	21	0	0	30	0	0	15	0	0	22	0
Lane Group Flow (vph)	172	700	0	88	652	0	52	551	0	125	664	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	26.0	26.0		26.0	26.0		21.0	21.0		21.0	21.0	
Effective Green, g (s)	26.0	26.0		26.0	26.0		21.0	21.0		21.0	21.0	
Actuated g/C Ratio	0.47	0.47		0.47	0.47		0.38	0.38		0.38	0.38	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Grp Cap (vph)	303	1641		285	1632		218	1331		272	1325	
v/s Ratio Prot		0.20			0.19			0.16			c0.19	
v/s Ratio Perm	c0.27			0.15			0.09			0.18		
v/c Ratio	0.57	0.43		0.31	0.40		0.24	0.41		0.46	0.50	
Uniform Delay, d1	10.4	9.6		9.0	9.4		11.6	12.5		12.7	13.0	
Progression Factor	0.64	0.57		0.41	0.34		1.00	1.00		1.00	1.00	
Incremental Delay, d2	7.3	0.8		2.6	0.7		2.6	1.0		5.5	1.4	
Delay (s)	14.0	6.3		6.3	3.9		14.1	13.4		18.2	14.3	
Level of Service	B	A		A	A		B	B		B	B	
Approach Delay (s)		7.8			4.2			13.5			15.0	
Approach LOS		A			A			B			B	

Intersection Summary			
HCM Average Control Delay	9.9	HCM Level of Service	A
HCM Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	55.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	60.7%	ICU Level of Service	B
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)	63	346	78	78	521	54	141	394	106	34	263	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.97		1.00	0.99		1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3448		1770	3493		1770	1814		1770	1863	1583
Flt Permitted	0.24	1.00		0.40	1.00		0.51	1.00		0.19	1.00	1.00
Satd. Flow (perm)	451	3448		737	3493		959	1814		360	1863	1583
Peak-hour factor, PHF	0.63	0.78	0.85	0.78	0.73	0.79	0.82	0.68	0.86	0.85	0.80	0.79
Adj. Flow (vph)	100	444	92	100	714	68	172	579	123	40	329	76
RTOR Reduction (vph)	0	32	0	0	13	0	0	14	0	0	0	39
Lane Group Flow (vph)	100	504	0	100	769	0	172	688	0	40	329	37
Turn Type	Perm			Perm			Perm			Perm		Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		6
Actuated Green, G (s)	20.0	20.0		20.0	20.0		27.0	27.0		27.0	27.0	27.0
Effective Green, g (s)	20.0	20.0		20.0	20.0		27.0	27.0		27.0	27.0	27.0
Actuated g/C Ratio	0.36	0.36		0.36	0.36		0.49	0.49		0.49	0.49	0.49
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Grp Cap (vph)	164	1254		268	1270		471	891		177	915	777
v/s Ratio Prot		0.15			0.22			c0.38			0.18	
v/s Ratio Perm	c0.22			0.14			0.18			0.11		0.02
v/c Ratio	0.61	0.40		0.37	0.61		0.37	0.77		0.23	0.36	0.05
Uniform Delay, d1	14.3	13.0		12.9	14.3		8.7	11.5		8.0	8.7	7.3
Progression Factor	0.52	0.47		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	15.2	0.9		3.9	2.2		2.2	6.5		2.9	1.1	0.1
Delay (s)	22.6	7.0		16.8	16.4		10.9	17.9		11.0	9.8	7.4
Level of Service	C	A		B	B		B	B		B	A	A
Approach Delay (s)		9.5			16.5			16.5			9.5	
Approach LOS		A			B			B			A	

Intersection Summary			
HCM Average Control Delay	13.8	HCM Level of Service	B
HCM Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	55.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	63.5%	ICU Level of Service	B
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)	45	630	99	86	497	72	96	369	94	57	302	63
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.97		1.00	0.98		1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3446		1770	3467		1770	1801		1770	1863	1583
Flt Permitted	0.36	1.00		0.27	1.00		0.49	1.00		0.31	1.00	1.00
Satd. Flow (perm)	675	3446		499	3467		913	1801		583	1863	1583
Peak-hour factor, PHF	0.80	0.97	0.71	0.86	0.93	0.86	0.89	0.93	0.84	0.84	0.91	0.88
Adj. Flow (vph)	56	649	139	100	534	84	108	397	112	68	332	72
RTOR Reduction (vph)	0	33	0	0	23	0	0	19	0	0	0	41
Lane Group Flow (vph)	56	755	0	100	595	0	108	490	0	68	332	31
Turn Type	Perm			Perm			Perm			Perm		Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		6
Actuated Green, G (s)	23.0	23.0		23.0	23.0		24.0	24.0		24.0	24.0	24.0
Effective Green, g (s)	23.0	23.0		23.0	23.0		24.0	24.0		24.0	24.0	24.0
Actuated g/C Ratio	0.42	0.42		0.42	0.42		0.44	0.44		0.44	0.44	0.44
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Grp Cap (vph)	282	1441		209	1450		398	786		254	813	691
v/s Ratio Prot		c0.22			0.17			c0.27			0.18	
v/s Ratio Perm	0.08			0.20			0.12			0.12		0.02
v/c Ratio	0.20	0.52		0.48	0.41		0.27	0.62		0.27	0.41	0.05
Uniform Delay, d1	10.2	11.9		11.6	11.2		9.9	12.0		9.9	10.6	8.9
Progression Factor	0.40	0.32		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	1.4	1.2		7.7	0.9		1.7	3.7		2.6	1.5	0.1
Delay (s)	5.5	5.1		19.3	12.1		11.6	15.7		12.5	12.2	9.0
Level of Service	A	A		B	B		B	B		B	B	A
Approach Delay (s)		5.1			13.1			15.0			11.7	
Approach LOS		A			B			B			B	

Intersection Summary			
HCM Average Control Delay	10.8	HCM Level of Service	B
HCM Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	55.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	67.1%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Intersection Turning Movement

Prepared by:

NDS

National Data & Surveying Services

TMC Summary of Pomona Blvd/Temple Ave

Project #: 08-2367-005

N

Pomona Blvd

Temple Ave

Temple Ave

Pomona Blvd

SOUTHBOUND APPROACH LANES

Lanes	1	.5	1.5
TOTAL	212	253	192
PM	105	110	136
NOON	0	0	0
AM	107	143	56

EASTBOUND APPROACH LANES

Lanes	TOTAL	AM	NOON	PM
1	168	57	0	111
3	1473	306	0	1167
0	52	31	0	21

WESTBOUND APPROACH LANES

AM	NOON	PM	TOTAL	Lanes
52	0	74	126	0
1160	0	882	2042	3
279	0	218	497	1

NORTHBOUND APPROACH LANES

PM	48	162	400
NOON	0	0	0
AM	61	70	180
TOTAL	109	232	580
Lanes	1	1	1

TURNING MOVEMENT COUNT

Pomona Blvd / Temple Ave

(Intersection Name)

Thursday
Day

10/9/08
Date

COUNT PERIODS			
am	7:00 AM	-	9:00 AM
noon		-	
pm	4:00 PM	-	6:00 PM

AM PEAK HOUR 700 AM

NOON PEAK HOUR 0 AM

PM PEAK HOUR 500 PM

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

N-S STREET: Pomona Blvd   DATE: 10/9/2008   LOCATION: City of Pomona

E-W STREET: Temple Ave   DAY: THURSDAY   PROJECT# 08-2367-005

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	1	1	1	1.5	.5	1	1	3	0	1	3	0	
6:00 AM													
6:15 AM													
6:30 AM													
6:45 AM													
7:00 AM	8	11	45	12	39	12	10	64	8	115	378	39	741
7:15 AM	19	13	48	17	36	33	19	78	4	86	317	5	675
7:30 AM	18	24	41	13	34	33	8	83	7	35	243	3	542
7:45 AM	16	22	46	14	34	29	20	81	12	43	222	5	544
8:00 AM	13	19	35	32	32	22	11	109	7	68	232	10	590
8:15 AM	11	14	47	15	30	19	27	85	7	100	283	23	661
8:30 AM	9	15	49	25	23	15	14	88	2	100	242	24	606
8:45 AM	5	14	23	23	17	8	25	52	5	79	261	37	549
9:00 AM													
9:15 AM													
9:30 AM													
9:45 AM													
10:00 AM													
10:15 AM													
10:30 AM													
10:45 AM													
11:00 AM													
11:15 AM													
11:30 AM													
11:45 AM													

TOTAL VOLUMES =	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
	99	132	334	151	245	171	134	640	52	626	2178	146	4908

AM Peak Hr Begins at: 700 AM

PEAK VOLUMES =	61	70	180	56	143	107	57	306	31	279	1160	52	2502
PEAK HR. FACTOR:		0.926			0.890			0.872			0.701		0.844

CONTROL: SIGNALIZED

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

N-S STREET:	Pomona Blvd	DATE:	10/9/2008	LOCATION:	City of Pomona
E-W STREET:	Temple Ave	DAY:	THURSDAY	PROJECT#	08-2367-005

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	1	1	1	1.5	.5	1	1	3	0	1	3	0	
1:00 PM													
1:15 PM													
1:30 PM													
1:45 PM													
2:00 PM													
2:15 PM													
2:30 PM													
2:45 PM													
3:00 PM													
3:15 PM													
3:30 PM													
3:45 PM													
4:00 PM	11	35	47	36	44	14	9	154	5	39	127	12	533
4:15 PM	14	22	77	44	11	33	31	288	2	58	230	21	831
4:30 PM	27	29	87	74	28	31	38	283	4	56	218	20	895
4:45 PM	15	27	86	22	11	29	40	260	7	50	172	16	735
5:00 PM	16	51	110	52	32	28	20	313	3	45	222	19	911
5:15 PM	9	43	108	30	23	27	24	303	5	56	200	19	847
5:30 PM	9	39	96	32	26	31	37	302	9	58	232	23	894
5:45 PM	14	29	86	22	29	19	30	249	4	59	228	13	782
6:00 PM													
6:15 PM													
6:30 PM													
6:45 PM													

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
VOLUMES =	115	275	697	312	204	212	229	2152	39	421	1629	143	6428

PM Peak Hr Begins at: 500 PM

PEAK VOLUMES =	48	162	400	136	110	105	111	1167	21	218	882	74	3434
PEAK HR. FACTOR:		0.862			0.783			0.933			0.938		0.942

CONTROL: SIGNALIZED

APPENDIX B: EXISTING LOS RESULTS

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	29	358	182	315	343	35	196	79	124	91	142	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.7	5.3	5.3	3.7	4.9		3.7	4.9	4.0	3.7	4.9	4.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		1.00	0.95	1.00	1.00	0.95	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	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	3539	1583	1770	3490		1770	3539	1583	1770	3539	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	3539	1583	1770	3490		1770	3539	1583	1770	3539	1583
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)	32	389	198	342	373	38	213	86	135	99	154	38
RTOR Reduction (vph)	0	0	157	0	7	0	0	0	135	0	0	38
Lane Group Flow (vph)	32	389	41	342	404	0	213	86	0	99	154	0
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA	NA	Prot	NA	NA
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2									
Actuated Green, G (s)	4.0	16.6	16.6	21.1	34.1		13.3	17.1	0.0	7.6	11.4	0.0
Effective Green, g (s)	4.0	16.6	16.6	21.1	34.1		13.3	17.1	0.0	7.6	11.4	0.0
Actuated g/C Ratio	0.05	0.21	0.21	0.26	0.43		0.17	0.21	0.00	0.10	0.14	0.00
Clearance Time (s)	3.7	5.3	5.3	3.7	4.9		3.7	4.9		3.7	4.9	
Vehicle Extension (s)	3.0	2.5	2.5	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	88	734	328	466	1487		294	756	0	168	504	0
v/s Ratio Prot	0.02	c0.11		c0.19	0.12		c0.12	0.02		0.06	c0.04	
v/s Ratio Perm			0.03									
v/c Ratio	0.36	0.53	0.13	0.73	0.27		0.72	0.11	0.00	0.59	0.31	0.00
Uniform Delay, d1	36.8	28.2	25.8	26.9	14.9		31.6	25.3	40.0	34.7	30.8	40.0
Progression Factor	1.00	1.00	1.00	1.00	1.00		0.87	0.68	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.5	2.7	0.8	5.9	0.5		8.3	0.1	0.0	5.2	0.3	0.0
Delay (s)	39.3	31.0	26.6	32.8	15.3		35.8	17.2	40.0	39.9	31.1	40.0
Level of Service	D	C	C	C	B		D	B	D	D	C	D
Approach Delay (s)		30.0			23.3			33.4			35.3	
Approach LOS		C			C			C			D	

Intersection Summary			
HCM 2000 Control Delay	29.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	17.6
Intersection Capacity Utilization	57.3%	ICU Level of Service	B
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)	41	201	66	92	391	104	120	477	85	94	632	45
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	5.0		3.5	5.0		3.5	5.0	4.0	3.5	5.0	4.0
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	0.96		1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	4896		1770	4925		1770	3539	1583	1770	3539	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	4896		1770	4925		1770	3539	1583	1770	3539	1583
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)	45	218	72	100	425	113	130	518	92	102	687	49
RTOR Reduction (vph)	0	58	0	0	74	0	0	0	92	0	0	49
Lane Group Flow (vph)	45	232	0	100	464	0	130	518	0	102	687	0
Turn Type	Prot	NA		Prot	NA		Prot	NA	NA	Prot	NA	NA
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	2.1	15.6		3.5	17.0		13.2	33.5	0.0	10.4	30.7	0.0
Effective Green, g (s)	2.1	15.6		3.5	17.0		13.2	33.5	0.0	10.4	30.7	0.0
Actuated g/C Ratio	0.03	0.20		0.04	0.21		0.16	0.42	0.00	0.13	0.38	0.00
Clearance Time (s)	3.5	5.0		3.5	5.0		3.5	5.0		3.5	5.0	
Vehicle Extension (s)	2.0	3.0		2.0	3.0		2.0	3.0		2.0	3.0	
Lane Grp Cap (vph)	46	954		77	1046		292	1481	0	230	1358	0
v/s Ratio Prot	0.03	0.05		c0.06	c0.09		c0.07	c0.15		0.06	c0.19	
v/s Ratio Perm												
v/c Ratio	0.98	0.24		1.30	0.44		0.45	0.35	0.00	0.44	0.51	0.00
Uniform Delay, d1	38.9	27.2		38.2	27.4		30.1	15.8	40.0	32.1	18.9	40.0
Progression Factor	1.00	1.00		1.00	1.00		1.52	0.51	1.00	0.93	0.77	1.00
Incremental Delay, d2	122.9	0.1		202.0	0.3		0.4	0.6	0.0	0.5	1.3	0.0
Delay (s)	161.8	27.3		240.3	27.7		46.1	8.6	40.0	30.3	15.8	40.0
Level of Service	F	C		F	C		D	A	D	C	B	D
Approach Delay (s)		45.4			61.0			19.1			19.0	
Approach LOS		D			E			B			B	

Intersection Summary			
HCM 2000 Control Delay	33.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	17.0
Intersection Capacity Utilization	52.3%	ICU Level of Service	A
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)	192	277	84	122	412	132	144	782	91	138	770	258
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	5.0		3.5	5.0	5.0	3.5	5.0		3.5	5.0	5.0
Lane Util. Factor	1.00	0.91		1.00	0.95	1.00	1.00	0.95		1.00	0.95	1.00
Frt	1.00	0.97		1.00	1.00	0.85	1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	4908		1770	3539	1583	1770	3484		1770	3539	1583
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	4908		1770	3539	1583	1770	3484		1770	3539	1583
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)	209	301	91	133	448	143	157	850	99	150	837	280
RTOR Reduction (vph)	0	66	0	0	0	117	0	10	0	0	0	137
Lane Group Flow (vph)	209	326	0	133	448	26	157	939	0	150	837	143
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA		Prot	NA	Perm
Protected Phases	7	4		3	8		1	6		5	2	
Permitted Phases						8						2
Actuated Green, G (s)	6.0	16.5		6.0	16.5	16.5	12.0	38.5		12.0	38.5	38.5
Effective Green, g (s)	6.0	16.5		6.0	16.5	16.5	12.0	38.5		12.0	38.5	38.5
Actuated g/C Ratio	0.07	0.18		0.07	0.18	0.18	0.13	0.43		0.13	0.43	0.43
Clearance Time (s)	3.5	5.0		3.5	5.0	5.0	3.5	5.0		3.5	5.0	5.0
Vehicle Extension (s)	2.0	2.5		2.0	2.5	2.5	2.0	2.5		2.0	2.5	2.5
Lane Grp Cap (vph)	118	899		118	648	290	236	1490		236	1513	677
v/s Ratio Prot	c0.12	0.07		0.08	c0.13		c0.09	c0.27		0.08	0.24	
v/s Ratio Perm						0.02						0.09
v/c Ratio	1.77	0.36		1.13	0.69	0.09	0.67	0.63		0.64	0.55	0.21
Uniform Delay, d1	42.0	32.1		42.0	34.4	30.5	37.1	20.2		36.9	19.3	16.2
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	379.1	0.2		121.1	2.9	0.1	5.4	2.0		4.1	1.5	0.7
Delay (s)	421.1	32.3		163.1	37.3	30.6	42.5	22.2		41.0	20.8	16.9
Level of Service	F	C		F	D	C	D	C		D	C	B
Approach Delay (s)		167.5			59.1			25.1			22.3	
Approach LOS		F			E			C			C	

Intersection Summary			
HCM 2000 Control Delay	53.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	17.0
Intersection Capacity Utilization	69.2%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	EBR2	WBL2	WBL	WBT	WBR	NBL2	NBL	NBT	NBR
Lane Configurations												
Volume (vph)	4	149	19	20	5	74	113	25	194	26	697	41
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0				4.0	4.0			4.0	4.0	
Lane Util. Factor		0.95				1.00	1.00			1.00	0.95	
Frt		0.97				1.00	0.97			1.00	0.99	
Flt Protected		1.00				0.95	1.00			0.95	1.00	
Satd. Flow (prot)		3408				1770	1804			1770	3508	
Flt Permitted		0.94				0.58	1.00			0.95	1.00	
Satd. Flow (perm)		3209				1073	1804			1770	3508	
Peak-hour factor, PHF	0.33	0.85	0.68	0.71	0.31	0.74	0.76	0.63	0.92	0.81	0.92	0.85
Adj. Flow (vph)	12	175	28	28	16	100	149	40	211	32	758	48
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	6	0
Lane Group Flow (vph)	0	243	0	0	0	116	189	0	0	243	800	0
Turn Type	Perm	NA			Perm	Perm	NA		Prot	Prot	NA	
Protected Phases		4					8		5	5	2	
Permitted Phases	4				8	8						
Actuated Green, G (s)		18.0				18.0	18.0			19.0	34.0	
Effective Green, g (s)		18.0				18.0	18.0			19.0	34.0	
Actuated g/C Ratio		0.22				0.22	0.22			0.24	0.42	
Clearance Time (s)		4.0				4.0	4.0			4.0	4.0	
Lane Grp Cap (vph)		722				241	405			420	1490	
v/s Ratio Prot							0.10			c0.14	c0.23	
v/s Ratio Perm		0.08				c0.11						
v/c Ratio		0.34				0.48	0.47			0.58	0.54	
Uniform Delay, d1		26.0				26.9	26.8			27.0	17.1	
Progression Factor		1.02				1.00	1.00			1.00	1.00	
Incremental Delay, d2		1.2				6.7	3.8			5.7	1.4	
Delay (s)		27.8				33.7	30.7			32.7	18.5	
Level of Service		C				C	C			C	B	
Approach Delay (s)		27.8					31.8				21.8	
Approach LOS		C					C				C	

Intersection Summary			
HCM 2000 Control Delay	25.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	57.8%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	SBL	SBT	SBR	SBR2
Lane Configurations				
Volume (vph)	180	356	281	14
Ideal Flow (vphpl)	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		
Lane Util. Factor	1.00	0.95		
Frt	1.00	0.93		
Flt Protected	0.95	1.00		
Satd. Flow (prot)	1770	3299		
Flt Permitted	0.95	1.00		
Satd. Flow (perm)	1770	3299		
Peak-hour factor, PHF	0.92	0.84	0.85	0.70
Adj. Flow (vph)	196	424	331	20
RTOR Reduction (vph)	0	2	0	0
Lane Group Flow (vph)	196	773	0	0
Turn Type	Prot	NA		
Protected Phases	1	6		
Permitted Phases				
Actuated Green, G (s)	16.0	31.0		
Effective Green, g (s)	16.0	31.0		
Actuated g/C Ratio	0.20	0.39		
Clearance Time (s)	4.0	4.0		
Lane Grp Cap (vph)	354	1278		
v/s Ratio Prot	0.11	c0.23		
v/s Ratio Perm				
v/c Ratio	0.55	0.60		
Uniform Delay, d1	28.8	19.6		
Progression Factor	1.07	1.15		
Incremental Delay, d2	5.4	1.9		
Delay (s)	36.2	24.4		
Level of Service	D	C		
Approach Delay (s)		26.8		
Approach LOS		C		

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	221	182	86	58	252	132	73	633	21	67	667	100
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.5	5.5	4.0	5.5	5.5	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95		1.00	0.95	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00		1.00	0.98	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	1770	3522		1770	3470	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.16	1.00		0.22	1.00	
Satd. Flow (perm)	1770	1863	1583	1770	1863	1583	303	3522		406	3470	
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)	240	198	93	63	274	143	79	688	23	73	725	109
RTOR Reduction (vph)	0	0	51	0	0	78	0	3	0	0	18	0
Lane Group Flow (vph)	240	198	42	63	274	65	79	708	0	73	816	0
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			4			8	
Permitted Phases			2			6	4			8		
Actuated Green, G (s)	15.2	36.5	36.5	5.4	26.7	26.7	24.6	24.6		24.6	24.6	
Effective Green, g (s)	15.2	36.5	36.5	5.4	26.7	26.7	24.6	24.6		24.6	24.6	
Actuated g/C Ratio	0.19	0.46	0.46	0.07	0.33	0.33	0.31	0.31		0.31	0.31	
Clearance Time (s)	4.0	5.5	5.5	4.0	5.5	5.5	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	1.5	2.0	2.0	1.5	2.0	2.0	2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	336	849	722	119	621	528	93	1083		124	1067	
v/s Ratio Prot	c0.14	0.11		0.04	c0.15			0.20			0.24	
v/s Ratio Perm			0.03			0.04	c0.26			0.18		
v/c Ratio	0.71	0.23	0.06	0.53	0.44	0.12	0.85	0.65		0.59	0.76	
Uniform Delay, d1	30.4	13.2	12.2	36.1	20.8	18.5	26.0	24.0		23.4	25.1	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.78	0.74		1.00	1.00	
Incremental Delay, d2	5.9	0.6	0.2	2.0	2.3	0.5	43.2	1.0		4.5	3.0	
Delay (s)	36.3	13.9	12.3	38.0	23.1	19.0	63.4	18.7		28.0	28.1	
Level of Service	D	B	B	D	C	B	E	B		C	C	
Approach Delay (s)		23.7			23.8			23.2			28.1	
Approach LOS		C			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	25.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	66.7%	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)	246	622	59	0	936	75	266	203	100	156	0	657
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.7	4.9			4.9	4.9	4.9	4.9		4.9		4.9
Lane Util. Factor	0.97	0.95			0.95	1.00	1.00	0.95		1.00		0.88
Frt	1.00	0.99			1.00	0.85	1.00	0.95		1.00		0.85
Flt Protected	0.95	1.00			1.00	1.00	0.95	1.00		0.95		1.00
Satd. Flow (prot)	3433	3493			3539	1583	1770	3364		1770		2787
Flt Permitted	0.95	1.00			1.00	1.00	0.95	1.00		0.52		1.00
Satd. Flow (perm)	3433	3493			3539	1583	1770	3364		976		2787
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)	267	676	64	0	1017	82	289	221	109	170	0	714
RTOR Reduction (vph)	0	8	0	0	0	48	0	78	0	0	0	408
Lane Group Flow (vph)	267	732	0	0	1017	34	289	252	0	170	0	306
Turn Type	Prot	NA			NA	Perm	Perm	NA		D.Pm		custom
Protected Phases	5	2			6			4				
Permitted Phases						6	4			4		4
Actuated Green, G (s)	10.1	47.2			33.4	33.4	23.0	23.0		23.0		23.0
Effective Green, g (s)	10.1	47.2			33.4	33.4	23.0	23.0		23.0		23.0
Actuated g/C Ratio	0.13	0.59			0.42	0.42	0.29	0.29		0.29		0.29
Clearance Time (s)	3.7	4.9			4.9	4.9	4.9	4.9		4.9		4.9
Vehicle Extension (s)	2.5	5.0			5.0	5.0	4.0	4.0		4.0		4.0
Lane Grp Cap (vph)	433	2060			1477	660	508	967		280		801
v/s Ratio Prot	c0.08	0.21			c0.29			0.08				
v/s Ratio Perm						0.02	0.16			c0.17		0.11
v/c Ratio	0.62	0.36			0.69	0.05	0.57	0.26		0.61		0.38
Uniform Delay, d1	33.1	8.5			19.0	13.9	24.3	22.0		24.6		22.8
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00		1.00		1.00
Incremental Delay, d2	2.2	0.5			2.6	0.1	1.8	0.2		4.3		0.4
Delay (s)	35.3	9.0			21.7	14.0	26.1	22.2		28.9		23.2
Level of Service	D	A			C	B	C	C		C		C
Approach Delay (s)		16.0			21.1			24.0			24.3	
Approach LOS		B			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	21.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	75.8%	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)	83	374	97	94	595	92	100	524	60	109	719	51
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.0		3.0	4.5		3.0	4.5		3.0	4.5	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.97		1.00	0.98		1.00	0.99		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3418		1770	3464		1770	3488		1770	3498	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3418		1770	3464		1770	3488		1770	3498	
Peak-hour factor, PHF	0.74	0.89	0.78	0.87	0.88	0.82	0.74	0.87	0.94	0.74	0.90	0.75
Adj. Flow (vph)	112	420	124	108	676	112	135	602	64	147	799	68
RTOR Reduction (vph)	0	28	0	0	14	0	0	8	0	0	6	0
Lane Group Flow (vph)	112	516	0	108	774	0	135	658	0	147	861	0
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	8.1	25.5		8.0	24.9		8.6	42.9		9.1	43.4	
Effective Green, g (s)	8.1	25.5		8.0	24.9		8.6	42.9		9.1	43.4	
Actuated g/C Ratio	0.08	0.26		0.08	0.25		0.09	0.43		0.09	0.43	
Clearance Time (s)	3.0	4.0		3.0	4.5		3.0	4.5		3.0	4.5	
Vehicle Extension (s)	1.5	4.5		1.5	4.5		1.5	4.5		1.5	4.5	
Lane Grp Cap (vph)	143	871		141	862		152	1496		161	1518	
v/s Ratio Prot	c0.06	0.15		0.06	c0.22		0.08	0.19		c0.08	c0.25	
v/s Ratio Perm												
v/c Ratio	0.78	0.59		0.77	0.90		0.89	0.44		0.91	0.57	
Uniform Delay, d1	45.1	32.7		45.1	36.3		45.2	20.1		45.1	21.2	
Progression Factor	1.00	1.00		1.05	1.33		1.00	1.00		1.00	1.00	
Incremental Delay, d2	22.2	1.5		16.4	10.6		40.7	0.9		45.5	1.5	
Delay (s)	67.3	34.2		63.9	58.8		86.0	21.0		90.5	22.8	
Level of Service	E	C		E	E		F	C		F	C	
Approach Delay (s)		39.8			59.4			32.0			32.6	
Approach LOS		D			E			C			C	

Intersection Summary			
HCM 2000 Control Delay	41.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	65.2%	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)	47	340	59	59	556	90	97	528	50	129	743	77
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.5		3.0	4.5		3.0	5.0		3.0	5.0	
Lane Util. Factor	1.00	0.91		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.98		1.00	0.98		1.00	0.99		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	4970		1770	3464		1770	3496		1770	3484	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	4970		1770	3464		1770	3496		1770	3484	
Peak-hour factor, PHF	0.90	0.86	0.84	0.86	0.86	0.84	0.71	0.91	0.99	0.80	0.92	0.83
Adj. Flow (vph)	52	395	70	69	647	107	137	580	51	161	808	93
RTOR Reduction (vph)	0	24	0	0	13	0	0	7	0	0	9	0
Lane Group Flow (vph)	52	441	0	69	741	0	137	624	0	161	892	0
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases												
Actuated Green, G (s)	5.8	45.8		6.2	46.2		8.0	24.5		8.0	24.5	
Effective Green, g (s)	5.8	45.8		6.2	46.2		8.0	24.5		8.0	24.5	
Actuated g/C Ratio	0.06	0.46		0.06	0.46		0.08	0.24		0.08	0.24	
Clearance Time (s)	3.0	4.5		3.0	4.5		3.0	5.0		3.0	5.0	
Vehicle Extension (s)	1.5	2.5		1.5	2.5		1.5	2.5		1.5	2.5	
Lane Grp Cap (vph)	102	2276		109	1600		141	856		141	853	
v/s Ratio Prot	0.03	0.09		c0.04	c0.21		0.08	0.18		c0.09	c0.26	
v/s Ratio Perm												
v/c Ratio	0.51	0.19		0.63	0.46		0.97	0.73		1.14	1.05	
Uniform Delay, d1	45.7	16.1		45.8	18.4		45.9	34.7		46.0	37.8	
Progression Factor	1.25	0.24		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.1	0.1		8.5	1.0		66.6	2.9		119.0	43.4	
Delay (s)	58.4	4.0		54.3	19.4		112.4	37.6		165.0	81.2	
Level of Service	E	A		D	B		F	D		F	F	
Approach Delay (s)		9.5			22.3			51.0			93.9	
Approach LOS		A			C			D			F	

Intersection Summary			
HCM 2000 Control Delay	51.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	15.5
Intersection Capacity Utilization	64.5%	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)	2	409	94	242	506	6	163	2	203	1	7	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5		3.5	5.5		4.0	4.0			4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00			1.00	
Frt	1.00	0.97		1.00	1.00		1.00	0.85			0.95	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			0.99	
Satd. Flow (prot)	1770	3432		1770	3525		1770	1587			1757	
Flt Permitted	0.43	1.00		0.95	1.00		0.74	1.00			0.96	
Satd. Flow (perm)	804	3432		1770	3525		1372	1587			1695	
Peak-hour factor, PHF	0.50	0.80	0.73	0.81	0.89	0.38	0.83	0.50	0.69	0.25	0.44	0.25
Adj. Flow (vph)	4	511	129	299	569	16	196	4	294	4	16	12
RTOR Reduction (vph)	0	28	0	0	2	0	0	234	0	0	10	0
Lane Group Flow (vph)	4	612	0	299	583	0	196	64	0	0	22	0
Turn Type	Perm	NA		Prot	NA		Perm	NA		Perm	NA	
Protected Phases		6		5	2			4			8	
Permitted Phases	6						4			8		
Actuated Green, G (s)	35.0	35.0		15.8	54.3		16.2	16.2			16.2	
Effective Green, g (s)	35.0	35.0		15.8	54.3		16.2	16.2			16.2	
Actuated g/C Ratio	0.44	0.44		0.20	0.68		0.20	0.20			0.20	
Clearance Time (s)	5.5	5.5		3.5	5.5		4.0	4.0			4.0	
Vehicle Extension (s)	4.5	4.5		3.0	4.5		3.0	3.0			3.0	
Lane Grp Cap (vph)	351	1501		349	2392		277	321			343	
v/s Ratio Prot		c0.18		c0.17	0.17			0.04				
v/s Ratio Perm	0.00						c0.14				0.01	
v/c Ratio	0.01	0.41		0.86	0.24		0.71	0.20			0.07	
Uniform Delay, d1	12.7	15.4		31.0	4.9		29.7	26.5			25.8	
Progression Factor	1.00	1.00		1.28	0.76		1.29	3.12			1.00	
Incremental Delay, d2	0.1	0.8		15.2	0.2		7.8	0.3			0.1	
Delay (s)	12.8	16.2		54.8	3.9		46.2	83.0			25.9	
Level of Service	B	B		D	A		D	F			C	
Approach Delay (s)		16.2			21.1			68.4			25.9	
Approach LOS		B			C			E			C	

Intersection Summary			
HCM 2000 Control Delay	31.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	54.7%	ICU Level of Service	A
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)	312	443	13	10	639	141	4	16	4	211	78	471
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	5.5		3.5	5.5			5.0		5.0	5.0	3.5
Lane Util. Factor	0.97	0.95		1.00	0.95			0.95		1.00	1.00	1.00
Frt	1.00	1.00		1.00	0.97			0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.99		0.95	1.00	1.00
Satd. Flow (prot)	3433	3524		1770	3443			3427		1770	1863	1583
Flt Permitted	0.95	1.00		0.95	1.00			0.93		0.74	1.00	1.00
Satd. Flow (perm)	3433	3524		1770	3443			3208		1379	1863	1583
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)	339	482	14	11	695	153	4	17	4	229	85	512
RTOR Reduction (vph)	0	2	0	0	22	0	0	3	0	0	0	76
Lane Group Flow (vph)	339	494	0	11	826	0	0	22	0	229	85	436
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA	pt+ov
Protected Phases	1	6		5	2			8			4	1 4
Permitted Phases							8			4		
Actuated Green, G (s)	9.9	44.5		1.1	35.7			20.4		20.4	20.4	35.3
Effective Green, g (s)	9.9	44.5		1.1	35.7			20.4		20.4	20.4	30.3
Actuated g/C Ratio	0.12	0.56		0.01	0.45			0.26		0.26	0.26	0.38
Clearance Time (s)	3.5	5.5		3.5	5.5			5.0		5.0	5.0	
Vehicle Extension (s)	2.5	4.5		1.5	4.5			2.5		3.0	3.0	
Lane Grp Cap (vph)	424	1960		24	1536			818		351	475	599
v/s Ratio Prot	c0.10	0.14		0.01	c0.24						0.05	c0.28
v/s Ratio Perm								0.01		0.17		
v/c Ratio	0.80	0.25		0.46	0.54			0.03		0.65	0.18	0.73
Uniform Delay, d1	34.1	9.2		39.2	16.1			22.4		26.6	23.3	21.3
Progression Factor	1.03	0.52		1.00	1.00			1.00		1.54	1.59	2.27
Incremental Delay, d2	9.1	0.3		5.0	1.4			0.0		3.8	0.2	3.6
Delay (s)	44.3	5.0		44.1	17.5			22.4		44.8	37.2	52.0
Level of Service	D	A		D	B			C		D	D	D
Approach Delay (s)		21.0			17.8			22.4			48.5	
Approach LOS		C			B			C			D	

Intersection Summary			
HCM 2000 Control Delay	28.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	68.4%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	36	43	33	236	195	250
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	39	47	36	257	212	272
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						637
pX, platoon unblocked						
vC, conflicting volume	860	164			292	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	860	164			292	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	86	95			83	
cM capacity (veh/h)	272	880			1269	

Direction, Lane #	WB 1	WB 2	NB 1	SB 1	SB 2
Volume Total	39	47	292	212	272
Volume Left	39	0	0	212	0
Volume Right	0	47	257	0	0
cSH	272	880	1700	1269	1700
Volume to Capacity	0.14	0.05	0.17	0.17	0.16
Queue Length 95th (ft)	12	4	0	15	0
Control Delay (s)	20.4	9.3	0.0	8.4	0.0
Lane LOS	C	A		A	
Approach Delay (s)	14.4		0.0	3.7	
Approach LOS	B				

Intersection Summary			
Average Delay	3.5		
Intersection Capacity Utilization	40.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	10	76	8	4	365	55
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	11	83	9	4	397	60
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)	469					
pX, platoon unblocked						
vC, conflicting volume			93		30	11
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			93		30	11
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		59	94
cM capacity (veh/h)			1499		974	1067

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	11	83	10	3	457
Volume Left	0	0	9	0	397
Volume Right	0	83	0	0	60
cSH	1700	1700	1499	1700	985
Volume to Capacity	0.01	0.05	0.01	0.00	0.46
Queue Length 95th (ft)	0	0	0	0	62
Control Delay (s)	0.0	0.0	6.4	0.0	11.8
Lane LOS			A		B
Approach Delay (s)	0.0		4.9		11.8
Approach LOS					B

Intersection Summary			
Average Delay	9.7		
Intersection Capacity Utilization	37.1%	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)	67	448	75	34	482	105	107	643	31	90	465	98
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0		4.0	5.0		4.0	5.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.98		1.00	0.97		1.00	0.99		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3455		1770	3446		1770	3500		1770	3442	
Flt Permitted	0.24	1.00		0.22	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	452	3455		408	3446		1770	3500		1770	3442	
Peak-hour factor, PHF	0.76	0.77	0.69	0.57	0.89	0.91	0.76	0.91	0.55	0.70	0.84	0.79
Adj. Flow (vph)	88	582	109	60	542	115	141	707	56	129	554	124
RTOR Reduction (vph)	0	20	0	0	24	0	0	7	0	0	24	0
Lane Group Flow (vph)	88	671	0	60	633	0	141	756	0	129	654	0
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)	22.1	22.1		22.1	22.1		7.9	36.0		7.9	36.0	
Effective Green, g (s)	22.1	22.1		22.1	22.1		7.9	36.0		7.9	36.0	
Actuated g/C Ratio	0.28	0.28		0.28	0.28		0.10	0.45		0.10	0.45	
Clearance Time (s)	5.0	5.0		5.0	5.0		4.0	5.0		4.0	5.0	
Vehicle Extension (s)	3.5	3.5		3.5	3.5		2.0	4.0		2.0	4.0	
Lane Grp Cap (vph)	124	954		112	951		174	1575		174	1548	
v/s Ratio Prot		0.19			0.18		c0.08	c0.22		0.07	0.19	
v/s Ratio Perm	c0.19			0.15								
v/c Ratio	0.71	0.70		0.54	0.67		0.81	0.48		0.74	0.42	
Uniform Delay, d1	26.1	26.0		24.6	25.7		35.3	15.4		35.1	14.9	
Progression Factor	1.00	1.00		0.74	0.78		1.00	1.00		1.00	1.00	
Incremental Delay, d2	17.5	2.5		4.4	1.5		22.9	1.0		13.8	0.8	
Delay (s)	43.6	28.5		22.6	21.5		58.2	16.5		48.8	15.8	
Level of Service	D	C		C	C		E	B		D	B	
Approach Delay (s)		30.2			21.6			23.0			21.1	
Approach LOS		C			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	23.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	61.3%	ICU Level of Service	B
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)	78	339	115	96	507	94	141	577	139	53	497	121
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	5.0		3.0	5.0		3.0	5.0	5.0	3.0	5.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	0.96		1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	3414		1770	3449		1770	3539	1583	1770	3539	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	3414		1770	3449		1770	3539	1583	1770	3539	1583
Peak-hour factor, PHF	0.85	0.71	0.78	0.69	0.84	0.76	0.80	0.87	0.77	0.74	0.96	0.92
Adj. Flow (vph)	92	477	147	139	604	124	176	663	181	72	518	132
RTOR Reduction (vph)	0	34	0	0	20	0	0	0	134	0	0	132
Lane Group Flow (vph)	92	590	0	139	708	0	176	663	47	72	518	0
Turn Type	Prot	NA		Prot	NA		Prot	NA	Perm	Prot	NA	NA
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases									8			
Actuated Green, G (s)	6.5	27.0		8.7	29.2		9.6	20.8	20.8	7.5	18.7	0.0
Effective Green, g (s)	6.5	27.0		8.7	29.2		9.6	20.8	20.8	7.5	18.7	0.0
Actuated g/C Ratio	0.08	0.34		0.11	0.36		0.12	0.26	0.26	0.09	0.23	0.00
Clearance Time (s)	3.0	5.0		3.0	5.0		3.0	5.0	5.0	3.0	5.0	
Vehicle Extension (s)	1.5	4.0		1.5	4.0		1.5	4.0	4.0	1.5	4.0	
Lane Grp Cap (vph)	143	1152		192	1258		212	920	411	165	827	0
v/s Ratio Prot	0.05	0.17		c0.08	c0.21		c0.10	c0.19		0.04	c0.15	
v/s Ratio Perm									0.03			
v/c Ratio	0.64	0.51		0.72	0.56		0.83	0.72	0.11	0.44	0.63	0.00
Uniform Delay, d1	35.6	21.2		34.5	20.3		34.4	27.0	22.6	34.3	27.5	40.0
Progression Factor	0.67	1.55		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	5.6	1.3		10.9	1.8		22.3	3.0	0.2	0.7	1.7	0.0
Delay (s)	29.5	34.1		45.3	22.1		56.7	30.0	22.7	34.9	29.2	40.0
Level of Service	C	C		D	C		E	C	C	C	C	D
Approach Delay (s)		33.5			25.8			33.3			31.7	
Approach LOS		C			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	31.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	57.9%	ICU Level of Service	B
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)	83	296	24	55	613	101	92	619	60	67	431	106
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.99		1.00	0.98		1.00	0.98		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3495		1770	3457		1770	3465		1770	3444	
Flt Permitted	0.18	1.00		0.41	1.00		0.37	1.00		0.29	1.00	
Satd. Flow (perm)	336	3495		766	3457		680	3465		542	3444	
Peak-hour factor, PHF	0.90	0.68	0.60	0.63	0.88	0.79	0.56	0.87	0.52	0.76	0.79	0.88
Adj. Flow (vph)	92	435	40	87	697	128	164	711	115	88	546	120
RTOR Reduction (vph)	0	10	0	0	22	0	0	13	0	0	19	0
Lane Group Flow (vph)	92	465	0	87	803	0	164	813	0	88	647	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	25.9	25.9		25.9	25.9		44.1	44.1		44.1	44.1	
Effective Green, g (s)	25.9	25.9		25.9	25.9		44.1	44.1		44.1	44.1	
Actuated g/C Ratio	0.32	0.32		0.32	0.32		0.55	0.55		0.55	0.55	
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		4.0	4.0		3.0	3.0	
Lane Grp Cap (vph)	108	1131		247	1119		374	1910		298	1898	
v/s Ratio Prot		0.13			0.23			0.23			0.19	
v/s Ratio Perm	c0.27			0.11			c0.24			0.16		
v/c Ratio	0.85	0.41		0.35	0.72		0.44	0.43		0.30	0.34	
Uniform Delay, d1	25.3	21.1		20.6	23.8		10.6	10.5		9.6	9.9	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	43.9	0.2		0.9	2.2		3.7	0.7		2.5	0.5	
Delay (s)	69.2	21.3		21.5	26.0		14.3	11.2		12.1	10.4	
Level of Service	E	C		C	C		B	B		B	B	
Approach Delay (s)		29.1			25.6			11.7			10.6	
Approach LOS		C			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	18.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	69.6%	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)	63	346	78	78	521	54	141	394	106	34	263	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0		4.5	4.5		4.5	4.5	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.96		1.00	0.98		1.00	0.97		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3414		1770	3486		1770	3418		1770	3438	
Flt Permitted	0.40	1.00		0.48	1.00		0.48	1.00		0.31	1.00	
Satd. Flow (perm)	743	3414		901	3486		898	3418		578	3438	
Peak-hour factor, PHF	0.80	0.97	0.71	0.86	0.93	0.86	0.89	0.93	0.84	0.84	0.91	0.88
Adj. Flow (vph)	79	357	110	91	560	63	158	424	126	40	289	68
RTOR Reduction (vph)	0	23	0	0	7	0	0	51	0	0	38	0
Lane Group Flow (vph)	79	444	0	91	616	0	158	499	0	40	319	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Actuated Green, G (s)	48.7	48.7		48.7	48.7		21.8	21.8		21.8	21.8	
Effective Green, g (s)	48.7	48.7		48.7	48.7		21.8	21.8		21.8	21.8	
Actuated g/C Ratio	0.61	0.61		0.61	0.61		0.27	0.27		0.27	0.27	
Clearance Time (s)	5.0	5.0		5.0	5.0		4.5	4.5		4.5	4.5	
Vehicle Extension (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Grp Cap (vph)	452	2078		548	2122		244	931		157	936	
v/s Ratio Prot		0.13			c0.18			0.15			0.09	
v/s Ratio Perm	0.11			0.10			c0.18			0.07		
v/c Ratio	0.17	0.21		0.17	0.29		0.65	0.54		0.25	0.34	
Uniform Delay, d1	6.9	7.0		6.8	7.4		25.7	24.8		22.7	23.3	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.96	1.99	
Incremental Delay, d2	0.8	0.2		0.7	0.3		6.5	0.8		0.8	0.2	
Delay (s)	7.7	7.3		7.5	7.8		32.2	25.6		45.5	46.8	
Level of Service	A	A		A	A		C	C		D	D	
Approach Delay (s)		7.3			7.7			27.0			46.6	
Approach LOS		A			A			C			D	

Intersection Summary			
HCM 2000 Control Delay	20.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.40		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	9.5
Intersection Capacity Utilization	57.9%	ICU Level of Service	B
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)	157	358	24	33	500	130	45	259	29	61	218	139
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5		5.5	5.5		4.5	4.5		4.5	4.5	4.5
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.99		1.00	0.97		1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3506		1770	3430		1770	1834		1770	1863	1583
Flt Permitted	0.38	1.00		0.51	1.00		0.61	1.00		0.50	1.00	1.00
Satd. Flow (perm)	713	3506		948	3430		1139	1834		929	1863	1583
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)	171	389	26	36	543	141	49	282	32	66	237	151
RTOR Reduction (vph)	0	9	0	0	44	0	0	8	0	0	0	103
Lane Group Flow (vph)	171	406	0	36	640	0	49	306	0	66	237	48
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		2			2			4			4	
Permitted Phases	2			2			4			4		4
Actuated Green, G (s)	19.4	19.4		19.4	19.4		13.7	13.7		13.7	13.7	13.7
Effective Green, g (s)	19.4	19.4		19.4	19.4		13.7	13.7		13.7	13.7	13.7
Actuated g/C Ratio	0.45	0.45		0.45	0.45		0.32	0.32		0.32	0.32	0.32
Clearance Time (s)	5.5	5.5		5.5	5.5		4.5	4.5		4.5	4.5	4.5
Vehicle Extension (s)	4.0	4.0		4.0	4.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	320	1578		426	1543		362	582		295	592	503
v/s Ratio Prot		0.12			0.19			c0.17			0.13	
v/s Ratio Perm	c0.24			0.04			0.04			0.07		0.03
v/c Ratio	0.53	0.26		0.08	0.41		0.14	0.53		0.22	0.40	0.10
Uniform Delay, d1	8.6	7.4		6.8	8.0		10.5	12.0		10.8	11.5	10.3
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	2.2	0.1		0.1	0.2		0.2	0.9		0.4	0.4	0.1
Delay (s)	10.8	7.5		6.9	8.3		10.6	12.9		11.2	11.9	10.4
Level of Service	B	A		A	A		B	B		B	B	B
Approach Delay (s)		8.4			8.2			12.6			11.3	
Approach LOS		A			A			B			B	

Intersection Summary			
HCM 2000 Control Delay	9.7	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	43.1	Sum of lost time (s)	10.0
Intersection Capacity Utilization	62.1%	ICU Level of Service	B
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)	57	306	31	279	1160	52	61	70	180	56	143	107
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	5.5		3.0	5.5		5.0	5.0		5.0	5.0	5.0
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	0.95		0.95	0.95	1.00
Frt	1.00	0.99		1.00	0.99		1.00	0.89		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	5015		1770	5052		1770	3157		1681	1766	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	5015		1770	5052		1770	3157		1681	1766	1583
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)	62	333	34	303	1261	57	66	76	196	61	155	116
RTOR Reduction (vph)	0	12	0	0	4	0	0	176	0	0	0	100
Lane Group Flow (vph)	62	355	0	303	1314	0	66	96	0	55	161	16
Turn Type	Prot	NA		Prot	NA		Split	NA		Split	NA	Perm
Protected Phases	1	6		5	2		4	4		8	8	
Permitted Phases												8
Actuated Green, G (s)	6.1	31.4		18.6	43.9		9.2	9.2		12.3	12.3	12.3
Effective Green, g (s)	6.1	31.4		18.6	43.9		9.2	9.2		12.3	12.3	12.3
Actuated g/C Ratio	0.07	0.35		0.21	0.49		0.10	0.10		0.14	0.14	0.14
Clearance Time (s)	3.0	5.5		3.0	5.5		5.0	5.0		5.0	5.0	5.0
Vehicle Extension (s)	1.5	4.5		1.5	4.5		2.5	2.5		2.5	2.5	2.5
Lane Grp Cap (vph)	119	1749		365	2464		180	322		229	241	216
v/s Ratio Prot	0.04	0.07		c0.17	c0.26		c0.04	0.03		0.03	c0.09	
v/s Ratio Perm												0.01
v/c Ratio	0.52	0.20		0.83	0.53		0.37	0.30		0.24	0.67	0.07
Uniform Delay, d1	40.5	20.5		34.2	16.0		37.7	37.4		34.7	36.9	33.9
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	1.9	0.3		14.1	0.8		0.9	0.4		0.4	6.2	0.1
Delay (s)	42.4	20.8		48.3	16.8		38.6	37.8		35.1	43.1	34.0
Level of Service	D	C		D	B		D	D		D	D	C
Approach Delay (s)		23.9			22.7			37.9			38.6	
Approach LOS		C			C			D			D	

Intersection Summary			
HCM 2000 Control Delay	26.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	18.5
Intersection Capacity Utilization	58.4%	ICU Level of Service	B
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)	385	298	401	84	1096	162	219	204	27	212	472	288
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	6.0		3.0	6.0		3.0	6.0		3.0	6.0	6.0
Lane Util. Factor	0.97	0.95		1.00	0.91		0.97	0.95		1.00	0.95	1.00
Frt	1.00	0.91		1.00	0.98		1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3433	3235		1770	4987		3433	3478		1770	3539	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3433	3235		1770	4987		3433	3478		1770	3539	1583
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)	418	324	436	91	1191	176	238	222	29	230	513	313
RTOR Reduction (vph)	0	213	0	0	17	0	0	9	0	0	0	223
Lane Group Flow (vph)	418	547	0	91	1350	0	238	242	0	230	513	90
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	Perm
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases												4
Actuated Green, G (s)	15.7	43.5		7.5	35.3		10.3	14.6		16.5	20.8	20.8
Effective Green, g (s)	15.7	43.5		7.5	35.3		10.3	14.6		16.5	20.8	20.8
Actuated g/C Ratio	0.16	0.43		0.07	0.35		0.10	0.15		0.16	0.21	0.21
Clearance Time (s)	3.0	6.0		3.0	6.0		3.0	6.0		3.0	6.0	6.0
Vehicle Extension (s)	1.5	4.0		1.5	4.0		1.5	4.0		1.5	4.0	4.0
Lane Grp Cap (vph)	538	1405		132	1758		353	507		291	735	328
v/s Ratio Prot	c0.12	0.17		0.05	c0.27		0.07	0.07		c0.13	c0.14	
v/s Ratio Perm												0.06
v/c Ratio	0.78	0.39		0.69	0.77		0.67	0.48		0.79	0.70	0.28
Uniform Delay, d1	40.5	19.3		45.2	28.8		43.3	39.3		40.1	36.7	33.3
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	6.4	0.2		11.3	2.2		4.0	1.0		12.7	3.1	0.6
Delay (s)	46.9	19.5		56.5	31.0		47.2	40.2		52.9	39.9	33.9
Level of Service	D	B		E	C		D	D		D	D	C
Approach Delay (s)		29.2			32.6			43.6			40.9	
Approach LOS		C			C			D			D	

Intersection Summary			
HCM 2000 Control Delay	35.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	100.1	Sum of lost time (s)	18.0
Intersection Capacity Utilization	71.7%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	590	316	741	524	147	495
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	0.97	0.88	0.95		1.00	0.95
Frt	1.00	0.85	0.94		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	3433	2787	3319		1770	3539
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	3433	2787	3319		1770	3539
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	641	343	805	570	160	538
RTOR Reduction (vph)	0	260	82	0	0	0
Lane Group Flow (vph)	641	83	1293	0	160	538
Turn Type	NA	Prot	NA		Prot	NA
Protected Phases	8	8	2		1	6
Permitted Phases						
Actuated Green, G (s)	23.0	23.0	39.2		14.2	57.4
Effective Green, g (s)	23.0	23.0	39.2		14.2	57.4
Actuated g/C Ratio	0.24	0.24	0.41		0.15	0.60
Clearance Time (s)	4.0	4.0	4.0		4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	825	670	1360		262	2124
v/s Ratio Prot	c0.19	0.03	c0.39		c0.09	0.15
v/s Ratio Perm						
v/c Ratio	0.78	0.12	0.95		0.61	0.25
Uniform Delay, d1	33.9	28.4	27.3		38.1	9.0
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	4.6	0.1	15.2		4.2	0.3
Delay (s)	38.5	28.5	42.4		42.3	9.3
Level of Service	D	C	D		D	A
Approach Delay (s)	35.0		42.4			16.9
Approach LOS	D		D			B

Intersection Summary			
HCM 2000 Control Delay	34.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	95.6	Sum of lost time (s)	16.0
Intersection Capacity Utilization	72.3%	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)	152	196	75	77	268	88	98	712	23	86	412	106
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		3.0	5.5		3.0	5.5	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.96		1.00	0.96		1.00	0.99		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3414		1770	3409		1770	3521		1770	3424	
Flt Permitted	0.37	1.00		0.48	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	689	3414		885	3409		1770	3521		1770	3424	
Peak-hour factor, PHF	0.84	0.72	0.89	0.84	0.75	0.76	0.54	0.88	0.82	0.49	0.82	0.76
Adj. Flow (vph)	181	272	84	92	357	116	181	809	28	176	502	139
RTOR Reduction (vph)	0	42	0	0	44	0	0	3	0	0	25	0
Lane Group Flow (vph)	181	314	0	92	429	0	181	834	0	176	616	0
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		6			2		7	4		3	8	
Permitted Phases	6			2								
Actuated Green, G (s)	22.6	22.6		22.6	22.6		11.6	33.5		11.4	33.3	
Effective Green, g (s)	22.6	22.6		22.6	22.6		11.6	33.5		11.4	33.3	
Actuated g/C Ratio	0.28	0.28		0.28	0.28		0.14	0.42		0.14	0.42	
Clearance Time (s)	4.0	4.0		4.0	4.0		3.0	5.5		3.0	5.5	
Vehicle Extension (s)	2.5	2.5		2.5	2.5		1.0	4.5		1.0	4.5	
Lane Grp Cap (vph)	194	964		250	963		256	1474		252	1425	
v/s Ratio Prot		0.09			0.13		c0.10	c0.24		0.10	0.18	
v/s Ratio Perm	c0.26			0.10								
v/c Ratio	0.93	0.33		0.37	0.44		0.71	0.57		0.70	0.43	
Uniform Delay, d1	28.0	22.7		23.0	23.6		32.6	17.7		32.7	16.6	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	45.6	0.1		0.7	0.2		7.1	1.6		6.7	1.0	
Delay (s)	73.6	22.8		23.7	23.8		39.7	19.3		39.3	17.6	
Level of Service	E	C		C	C		D	B		D	B	
Approach Delay (s)		39.9			23.8			22.9			22.3	
Approach LOS		D			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	26.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	12.5
Intersection Capacity Utilization	58.4%	ICU Level of Service	B
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)	73	77	70	81	137	27	102	767	81	24	488	80
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	3.5	4.5	4.0	3.5	4.5	4.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1770	3539	1583	1770	3539	1583
Flt Permitted	0.66	1.00	1.00	0.70	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1225	3539	1583	1303	3539	1583	1770	3539	1583	1770	3539	1583
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)	79	84	76	88	149	29	111	834	88	26	530	87
RTOR Reduction (vph)	0	0	76	0	0	29	0	0	88	0	0	87
Lane Group Flow (vph)	79	84	0	88	149	0	111	834	0	26	530	0
Turn Type	Perm	NA	NA	Perm	NA	NA	Prot	NA	NA	Prot	NA	NA
Protected Phases		2			6		7	4		3	8	
Permitted Phases	2			6								
Actuated Green, G (s)	8.6	8.6	0.0	8.6	8.6	0.0	4.2	22.4	0.0	0.5	18.7	0.0
Effective Green, g (s)	8.6	8.6	0.0	8.6	8.6	0.0	4.2	22.4	0.0	0.5	18.7	0.0
Actuated g/C Ratio	0.20	0.20	0.00	0.20	0.20	0.00	0.10	0.51	0.00	0.01	0.43	0.00
Clearance Time (s)	4.0	4.0		4.0	4.0		3.5	4.5		3.5	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		2.0	2.5		2.0	2.5	
Lane Grp Cap (vph)	242	699	0	257	699	0	170	1822	0	20	1521	0
v/s Ratio Prot		0.02			0.04		c0.06	c0.24		0.01	0.15	
v/s Ratio Perm	0.06			c0.07								
v/c Ratio	0.33	0.12	0.00	0.34	0.21	0.00	0.65	0.46	0.00	1.30	0.35	0.00
Uniform Delay, d1	15.0	14.3	21.8	15.0	14.6	21.8	18.9	6.7	21.8	21.5	8.3	21.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.8	0.1	0.0	0.8	0.2	0.0	6.7	0.1	0.0	306.7	0.1	0.0
Delay (s)	15.8	14.4	21.8	15.8	14.8	21.8	25.6	6.8	21.8	328.2	8.4	21.8
Level of Service	B	B	C	B	B	C	C	A	C	F	A	C
Approach Delay (s)		17.2			15.9			10.1			23.2	
Approach LOS		B			B			B			C	

Intersection Summary			
HCM 2000 Control Delay	15.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	43.5	Sum of lost time (s)	12.0
Intersection Capacity Utilization	50.0%	ICU Level of Service	A
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)	97	561	166	237	512	36	312	181	193	97	96	47
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.7	5.3	5.3	3.7	4.9		3.7	5.3	4.0	3.7	4.9	4.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		1.00	0.95	1.00	1.00	0.95	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	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	3539	1583	1770	3504		1770	3539	1583	1770	3539	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	3539	1583	1770	3504		1770	3539	1583	1770	3539	1583
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)	105	610	180	258	557	39	339	197	210	105	104	51
RTOR Reduction (vph)	0	0	118	0	5	0	0	0	210	0	0	51
Lane Group Flow (vph)	105	610	62	258	591	0	339	197	0	105	104	0
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA	NA	Prot	NA	NA
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2									
Actuated Green, G (s)	9.7	34.4	34.4	18.6	43.7		20.0	14.5	0.0	14.5	9.4	0.0
Effective Green, g (s)	9.7	34.4	34.4	18.6	43.7		20.0	14.5	0.0	14.5	9.4	0.0
Actuated g/C Ratio	0.10	0.34	0.34	0.19	0.44		0.20	0.14	0.00	0.14	0.09	0.00
Clearance Time (s)	3.7	5.3	5.3	3.7	4.9		3.7	5.3		3.7	4.9	
Vehicle Extension (s)	3.0	2.5	2.5	3.0	3.0		3.0	2.5		3.0	3.0	
Lane Grp Cap (vph)	171	1217	544	329	1531		354	513	0	256	332	0
v/s Ratio Prot	0.06	c0.17		c0.15	0.17		c0.19	0.06		c0.06	0.03	
v/s Ratio Perm			0.04									
v/c Ratio	0.61	0.50	0.11	0.78	0.39		0.96	0.38	0.00	0.41	0.31	0.00
Uniform Delay, d1	43.4	26.0	22.4	38.8	19.1		39.6	38.7	50.0	38.9	42.3	50.0
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	6.4	1.5	0.4	11.6	0.7		36.4	0.3	0.0	1.1	0.5	0.0
Delay (s)	49.7	27.5	22.8	50.4	19.8		75.9	39.1	50.0	39.9	42.8	50.0
Level of Service	D	C	C	D	B		E	D	D	D	D	D
Approach Delay (s)		29.2			29.0			58.9			43.1	
Approach LOS		C			C			E			D	

Intersection Summary			
HCM 2000 Control Delay	38.5	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	64.4%	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)	109	950	66	120	331	109	101	605	270	143	554	45
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	5.0		3.5	5.0		3.5	5.0	4.0	3.5	5.0	4.0
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	0.99		1.00	0.96		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	5036		1770	4897		1770	3539	1583	1770	3539	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	5036		1770	4897		1770	3539	1583	1770	3539	1583
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)	118	1033	72	130	360	118	110	658	293	155	602	49
RTOR Reduction (vph)	0	10	0	0	80	0	0	0	293	0	0	49
Lane Group Flow (vph)	118	1095	0	130	398	0	110	658	0	155	602	0
Turn Type	Prot	NA		Prot	NA		Prot	NA	NA	Prot	NA	NA
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	3.5	25.1		3.5	25.1		7.4	27.0	0.0	7.4	27.0	0.0
Effective Green, g (s)	3.5	25.1		3.5	25.1		7.4	27.0	0.0	7.4	27.0	0.0
Actuated g/C Ratio	0.04	0.31		0.04	0.31		0.09	0.34	0.00	0.09	0.34	0.00
Clearance Time (s)	3.5	5.0		3.5	5.0		3.5	5.0		3.5	5.0	
Vehicle Extension (s)	2.0	3.0		2.0	3.0		2.0	3.0		2.0	3.0	
Lane Grp Cap (vph)	77	1580		77	1536		163	1194	0	163	1194	0
v/s Ratio Prot	0.07	c0.22		c0.07	0.08		0.06	c0.19		c0.09	0.17	
v/s Ratio Perm												
v/c Ratio	1.53	0.69		1.69	0.26		0.67	0.55	0.00	0.95	0.50	0.00
Uniform Delay, d1	38.2	24.1		38.2	20.5		35.1	21.6	40.0	36.1	21.2	40.0
Progression Factor	1.00	1.00		1.00	1.00		1.41	0.66	1.00	0.91	0.81	1.00
Incremental Delay, d2	294.4	1.3		359.2	0.1		8.0	1.8	0.0	53.6	1.4	0.0
Delay (s)	332.6	25.4		397.4	20.6		57.7	16.1	40.0	86.6	18.5	40.0
Level of Service	F	C		F	C		E	B	D	F	B	D
Approach Delay (s)		55.0			101.2			27.0			32.9	
Approach LOS		E			F			C			C	

Intersection Summary			
HCM 2000 Control Delay	49.8	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	17.0
Intersection Capacity Utilization	66.1%	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)	265	717	119	205	373	137	136	828	109	159	682	136
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	5.0		3.5	5.0	5.0	3.5	5.0		3.5	5.0	5.0
Lane Util. Factor	1.00	0.91		1.00	0.95	1.00	1.00	0.95		1.00	0.95	1.00
Frt	1.00	0.98		1.00	1.00	0.85	1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	4977		1770	3539	1583	1770	3478		1770	3539	1583
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	4977		1770	3539	1583	1770	3478		1770	3539	1583
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)	288	779	129	223	405	149	148	900	118	173	741	148
RTOR Reduction (vph)	0	28	0	0	0	121	0	11	0	0	0	93
Lane Group Flow (vph)	288	880	0	223	405	28	148	1007	0	173	741	55
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA		Prot	NA	Perm
Protected Phases	7	4		3	8		1	6		5	2	
Permitted Phases						8						2
Actuated Green, G (s)	11.0	21.2		7.0	17.2	17.2	11.3	31.8		13.0	33.5	33.5
Effective Green, g (s)	11.0	21.2		7.0	17.2	17.2	11.3	31.8		13.0	33.5	33.5
Actuated g/C Ratio	0.12	0.24		0.08	0.19	0.19	0.13	0.35		0.14	0.37	0.37
Clearance Time (s)	3.5	5.0		3.5	5.0	5.0	3.5	5.0		3.5	5.0	5.0
Vehicle Extension (s)	2.0	2.5		2.0	2.5	2.5	2.0	2.5		2.0	2.5	2.5
Lane Grp Cap (vph)	216	1172		137	676	302	222	1228		255	1317	589
v/s Ratio Prot	c0.16	c0.18		c0.13	0.11		0.08	c0.29		c0.10	0.21	
v/s Ratio Perm						0.02						0.03
v/c Ratio	1.33	0.75		1.63	0.60	0.09	0.67	0.82		0.68	0.56	0.09
Uniform Delay, d1	39.5	32.0		41.5	33.3	30.0	37.6	26.5		36.5	22.4	18.4
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	178.1	2.6		313.2	1.2	0.1	5.7	6.2		5.5	1.7	0.3
Delay (s)	217.6	34.6		354.7	34.5	30.1	43.3	32.7		42.1	24.2	18.7
Level of Service	F	C		F	C	C	D	C		D	C	B
Approach Delay (s)		78.6			125.5			34.0			26.3	
Approach LOS		E			F			C			C	

Intersection Summary			
HCM 2000 Control Delay	61.7	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	17.0
Intersection Capacity Utilization	78.0%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	EBR2	WBL2	WBL	WBT	WBR	NBL2	NBL	NBT	NBR
Lane Configurations												
Volume (vph)	3	186	26	28	10	55	106	20	222	17	642	63
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0				4.0	4.0			4.0	4.0	
Lane Util. Factor		0.95				1.00	1.00			1.00	0.95	
Frt		0.95				1.00	0.97			1.00	0.99	
Flt Protected		1.00				0.95	1.00			0.95	1.00	
Satd. Flow (prot)		3360				1770	1799			1770	3488	
Flt Permitted		0.95				0.47	1.00			0.95	1.00	
Satd. Flow (perm)		3186				877	1799			1770	3488	
Peak-hour factor, PHF	0.33	0.91	0.65	0.44	0.63	0.72	0.86	0.56	0.73	0.61	0.91	0.83
Adj. Flow (vph)	9	204	40	64	16	76	123	36	304	28	705	76
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	10	0
Lane Group Flow (vph)	0	317	0	0	0	92	159	0	0	332	771	0
Turn Type	Perm	NA			Perm	Perm	NA		Prot	Prot	NA	
Protected Phases		4					8		5	5	2	
Permitted Phases	4				8	8						
Actuated Green, G (s)		16.0				16.0	16.0			22.0	34.0	
Effective Green, g (s)		16.0				16.0	16.0			22.0	34.0	
Actuated g/C Ratio		0.20				0.20	0.20			0.28	0.42	
Clearance Time (s)		4.0				4.0	4.0			4.0	4.0	
Lane Grp Cap (vph)		637				175	359			486	1482	
v/s Ratio Prot							0.09			c0.19	c0.22	
v/s Ratio Perm		0.10				c0.10						
v/c Ratio		0.50				0.53	0.44			0.68	0.52	
Uniform Delay, d1		28.4				28.6	28.1			25.9	17.0	
Progression Factor		1.02				1.00	1.00			1.00	1.00	
Incremental Delay, d2		2.7				10.8	3.9			7.6	1.3	
Delay (s)		31.7				39.5	32.0			33.5	18.3	
Level of Service		C				D	C			C	B	
Approach Delay (s)		31.7					34.7				22.8	
Approach LOS		C					C				C	

Intersection Summary			
HCM 2000 Control Delay	28.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	64.6%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	SBL	SBT	SBR	SBR2
Lane Configurations				
Volume (vph)	209	451	351	17
Ideal Flow (vphpl)	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		
Lane Util. Factor	1.00	0.95		
Frt	1.00	0.93		
Flt Protected	0.95	1.00		
Satd. Flow (prot)	1770	3300		
Flt Permitted	0.95	1.00		
Satd. Flow (perm)	1770	3300		
Peak-hour factor, PHF	0.90	0.88	0.88	0.85
Adj. Flow (vph)	232	512	399	20
RTOR Reduction (vph)	0	2	0	0
Lane Group Flow (vph)	232	929	0	0
Turn Type	Prot	NA		
Protected Phases	1	6		
Permitted Phases				
Actuated Green, G (s)	18.0	30.0		
Effective Green, g (s)	18.0	30.0		
Actuated g/C Ratio	0.22	0.38		
Clearance Time (s)	4.0	4.0		
Lane Grp Cap (vph)	398	1237		
v/s Ratio Prot	0.13	c0.28		
v/s Ratio Perm				
v/c Ratio	0.58	0.75		
Uniform Delay, d1	27.7	21.8		
Progression Factor	1.11	1.19		
Incremental Delay, d2	5.6	3.9		
Delay (s)	36.4	29.8		
Level of Service	D	C		
Approach Delay (s)		31.1		
Approach LOS		C		

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	199	295	136	93	226	117	97	904	75	143	1026	234
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5	5.5	5.5	5.5	5.5	4.0	5.5		4.0	5.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95		1.00	0.95	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99		1.00	0.97	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	1770	3498		1770	3441	
Flt Permitted	0.49	1.00	1.00	0.36	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	911	1863	1583	670	1863	1583	1770	3498		1770	3441	
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)	216	321	148	101	246	127	105	983	82	155	1115	254
RTOR Reduction (vph)	0	0	110	0	0	66	0	7	0	0	24	0
Lane Group Flow (vph)	216	321	38	101	246	61	105	1058	0	155	1345	0
Turn Type	Perm	NA	Perm	Perm	NA	custom	Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8		6						
Actuated Green, G (s)	20.4	20.4	20.4	20.4	20.4	38.2	6.4	34.9		9.7	38.2	
Effective Green, g (s)	20.4	20.4	20.4	20.4	20.4	38.2	6.4	34.9		9.7	38.2	
Actuated g/C Ratio	0.26	0.26	0.26	0.26	0.26	0.48	0.08	0.44		0.12	0.48	
Clearance Time (s)	5.5	5.5	5.5	5.5	5.5	5.5	4.0	5.5		4.0	5.5	
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0	3.0	2.0		3.0	2.0	
Lane Grp Cap (vph)	232	475	403	170	475	755	141	1526		214	1643	
v/s Ratio Prot		0.17			0.13		0.06	0.30		c0.09	c0.39	
v/s Ratio Perm	c0.24		0.02	0.15		0.04						
v/c Ratio	0.93	0.68	0.09	0.59	0.52	0.08	0.74	0.69		0.72	0.82	
Uniform Delay, d1	29.1	26.8	22.7	26.2	25.6	11.4	36.0	18.2		33.9	17.9	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.92	1.50		1.00	1.00	
Incremental Delay, d2	40.0	3.0	0.0	3.7	0.4	0.2	12.1	1.6		11.5	4.7	
Delay (s)	69.1	29.8	22.8	29.8	26.0	11.6	45.3	28.9		45.3	22.6	
Level of Service	E	C	C	C	C	B	D	C		D	C	
Approach Delay (s)		40.7			22.9			30.4			24.9	
Approach LOS		D			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	29.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	81.2%	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)	439	1606	182	0	801	123	93	293	101	214	0	392
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.7	4.9			4.9	4.9	4.9	4.9		4.9		4.9
Lane Util. Factor	0.97	0.95			0.95	1.00	1.00	0.95		1.00		0.88
Frt	1.00	0.98			1.00	0.85	1.00	0.96		1.00		0.85
Flt Protected	0.95	1.00			1.00	1.00	0.95	1.00		0.95		1.00
Satd. Flow (prot)	3433	3485			3539	1583	1770	3403		1770		2787
Flt Permitted	0.95	1.00			1.00	1.00	0.95	1.00		0.40		1.00
Satd. Flow (perm)	3433	3485			3539	1583	1770	3403		754		2787
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)	477	1746	198	0	871	134	101	318	110	233	0	426
RTOR Reduction (vph)	0	8	0	0	0	79	0	17	0	0	0	304
Lane Group Flow (vph)	477	1936	0	0	871	55	101	411	0	233	0	122
Turn Type	Prot	NA			NA	Perm	Perm	NA		D.Pm		custom
Protected Phases	5	2			6			4				
Permitted Phases						6	4			4		4
Actuated Green, G (s)	18.2	65.2			43.3	43.3	30.0	30.0		30.0		30.0
Effective Green, g (s)	18.2	65.2			43.3	43.3	30.0	30.0		30.0		30.0
Actuated g/C Ratio	0.17	0.62			0.41	0.41	0.29	0.29		0.29		0.29
Clearance Time (s)	3.7	4.9			4.9	4.9	4.9	4.9		4.9		4.9
Vehicle Extension (s)	2.5	5.0			5.0	5.0	4.0	4.0		4.0		4.0
Lane Grp Cap (vph)	595	2164			1459	652	505	972		215		796
v/s Ratio Prot	0.14	c0.56			0.25			0.12				
v/s Ratio Perm						0.03	0.06			c0.31		0.04
v/c Ratio	0.80	0.89			0.60	0.08	0.20	0.42		1.08		0.15
Uniform Delay, d1	41.7	17.0			24.0	18.8	28.4	30.5		37.5		28.0
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00		1.00		1.00
Incremental Delay, d2	7.4	6.2			1.8	0.3	0.3	0.4		85.5		0.1
Delay (s)	49.1	23.2			25.9	19.0	28.7	30.9		123.0		28.1
Level of Service	D	C			C	B	C	C		F		C
Approach Delay (s)		28.3			24.9			30.5			61.7	
Approach LOS		C			C			C			E	

Intersection Summary			
HCM 2000 Control Delay	32.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.99		
Actuated Cycle Length (s)	105.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	84.9%	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)	145	737	178	160	584	136	109	731	137	92	642	58
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.0		3.0	4.5		3.0	4.5		3.0	4.5	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.97		1.00	0.97		1.00	0.98		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3425		1770	3433		1770	3461		1770	3487	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3425		1770	3433		1770	3461		1770	3487	
Peak-hour factor, PHF	0.74	0.89	0.78	0.87	0.88	0.82	0.74	0.87	0.94	0.74	0.90	0.75
Adj. Flow (vph)	196	828	228	184	664	166	147	840	146	124	713	77
RTOR Reduction (vph)	0	25	0	0	23	0	0	14	0	0	8	0
Lane Group Flow (vph)	196	1031	0	184	807	0	147	972	0	124	782	0
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	12.2	35.0		12.9	35.2		10.1	28.2		9.4	27.5	
Effective Green, g (s)	12.2	35.0		12.9	35.2		10.1	28.2		9.4	27.5	
Actuated g/C Ratio	0.12	0.35		0.13	0.35		0.10	0.28		0.09	0.28	
Clearance Time (s)	3.0	4.0		3.0	4.5		3.0	4.5		3.0	4.5	
Vehicle Extension (s)	1.5	4.5		1.5	4.5		1.5	4.5		1.5	4.5	
Lane Grp Cap (vph)	215	1198		228	1208		178	976		166	958	
v/s Ratio Prot	c0.11	c0.30		0.10	0.24		c0.08	c0.28		0.07	0.22	
v/s Ratio Perm												
v/c Ratio	0.91	0.86		0.81	0.67		0.83	1.00		0.75	0.82	
Uniform Delay, d1	43.4	30.2		42.3	27.5		44.1	35.8		44.1	33.9	
Progression Factor	1.00	1.00		0.80	1.04		0.95	1.27		1.00	1.00	
Incremental Delay, d2	37.3	6.9		14.9	1.4		21.4	25.5		14.7	7.6	
Delay (s)	80.7	37.2		48.6	30.0		63.3	71.0		58.9	41.5	
Level of Service	F	D		D	C		E	E		E	D	
Approach Delay (s)		44.0			33.4			70.0			43.9	
Approach LOS		D			C			E			D	

Intersection Summary			
HCM 2000 Control Delay	48.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	78.3%	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)	140	726	94	72	646	118	100	756	83	131	637	80
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.5		3.0	4.5		3.0	5.0		3.0	5.0	
Lane Util. Factor	1.00	0.91		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.98		1.00	0.98		1.00	0.98		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	4990		1770	3451		1770	3481		1770	3487	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	4990		1770	3451		1770	3481		1770	3487	
Peak-hour factor, PHF	0.84	0.86	0.78	0.74	0.95	0.87	0.76	0.87	0.78	0.77	0.79	0.92
Adj. Flow (vph)	167	844	121	97	680	136	132	869	106	170	806	87
RTOR Reduction (vph)	0	18	0	0	17	0	0	9	0	0	8	0
Lane Group Flow (vph)	167	947	0	97	799	0	132	966	0	170	885	0
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases												
Actuated Green, G (s)	8.5	44.2		7.8	43.5		8.0	24.5		8.0	24.5	
Effective Green, g (s)	8.5	44.2		7.8	43.5		8.0	24.5		8.0	24.5	
Actuated g/C Ratio	0.08	0.44		0.08	0.44		0.08	0.24		0.08	0.24	
Clearance Time (s)	3.0	4.5		3.0	4.5		3.0	5.0		3.0	5.0	
Vehicle Extension (s)	1.5	2.5		1.5	2.5		1.5	2.5		1.5	2.5	
Lane Grp Cap (vph)	150	2205		138	1501		141	852		141	854	
v/s Ratio Prot	c0.09	0.19		0.05	c0.23		0.07	c0.28		c0.10	0.25	
v/s Ratio Perm												
v/c Ratio	1.11	0.43		0.70	0.53		0.94	1.13		1.21	1.04	
Uniform Delay, d1	45.7	19.2		45.0	20.8		45.7	37.8		46.0	37.8	
Progression Factor	0.73	1.71		0.94	0.96		1.03	0.98		1.00	1.00	
Incremental Delay, d2	88.1	0.3		11.6	1.3		54.7	74.3		141.5	40.5	
Delay (s)	121.4	33.2		54.0	21.2		101.7	111.4		187.5	78.2	
Level of Service	F	C		D	C		F	F		F	E	
Approach Delay (s)		46.2			24.7			110.3			95.7	
Approach LOS		D			C			F			F	

Intersection Summary			
HCM 2000 Control Delay	70.8	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	15.5
Intersection Capacity Utilization	74.8%	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)	3	887	134	157	710	2	187	8	235	1	6	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5		3.5	5.5		4.0	4.0			4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00			1.00	
Frt	1.00	0.98		1.00	1.00		1.00	0.87			0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			1.00	
Satd. Flow (prot)	1770	3464		1770	3536		1770	1612			1809	
Flt Permitted	0.34	1.00		0.95	1.00		0.74	1.00			0.94	
Satd. Flow (perm)	637	3464		1770	3536		1384	1612			1713	
Peak-hour factor, PHF	0.50	0.92	0.85	0.90	0.87	0.38	0.87	0.25	0.85	0.44	0.38	0.50
Adj. Flow (vph)	6	964	158	174	816	5	215	32	276	2	16	4
RTOR Reduction (vph)	0	13	0	0	0	0	0	204	0	0	3	0
Lane Group Flow (vph)	6	1109	0	174	821	0	215	105	0	0	19	0
Turn Type	Perm	NA		Prot	NA		Perm	NA		Perm	NA	
Protected Phases		6		5	2			4			8	
Permitted Phases	6						4			8		
Actuated Green, G (s)	57.5	57.5		10.9	71.9		18.6	18.6			18.6	
Effective Green, g (s)	57.5	57.5		10.9	71.9		18.6	18.6			18.6	
Actuated g/C Ratio	0.57	0.57		0.11	0.72		0.19	0.19			0.19	
Clearance Time (s)	5.5	5.5		3.5	5.5		4.0	4.0			4.0	
Vehicle Extension (s)	4.5	4.5		3.0	4.5		3.0	3.0			3.0	
Lane Grp Cap (vph)	366	1991		192	2542		257	299			318	
v/s Ratio Prot		c0.32		c0.10	0.23			0.06				
v/s Ratio Perm	0.01						c0.16				0.01	
v/c Ratio	0.02	0.56		0.91	0.32		0.84	0.35			0.06	
Uniform Delay, d1	9.1	13.3		44.0	5.1		39.2	35.4			33.5	
Progression Factor	0.32	0.56		1.00	1.00		1.65	4.16			1.00	
Incremental Delay, d2	0.1	0.9		39.4	0.3		13.6	0.4			0.1	
Delay (s)	3.0	8.3		83.4	5.5		78.3	147.8			33.6	
Level of Service	A	A		F	A		E	F			C	
Approach Delay (s)		8.3			19.1			119.2			33.6	
Approach LOS		A			B			F			C	

Intersection Summary			
HCM 2000 Control Delay	34.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	65.8%	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)	614	906	104	27	743	167	63	131	54	248	141	373
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	5.5		3.5	5.5			5.0		5.0	5.0	3.5
Lane Util. Factor	0.97	0.95		1.00	0.95			0.95		1.00	1.00	1.00
Frt	1.00	0.98		1.00	0.97			0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.99		0.95	1.00	1.00
Satd. Flow (prot)	3433	3485		1770	3442			3380		1770	1863	1583
Flt Permitted	0.95	1.00		0.95	1.00			0.84		0.59	1.00	1.00
Satd. Flow (perm)	3433	3485		1770	3442			2868		1092	1863	1583
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)	667	985	113	29	808	182	68	142	59	270	153	405
RTOR Reduction (vph)	0	10	0	0	24	0	0	33	0	0	0	32
Lane Group Flow (vph)	667	1088	0	29	966	0	0	236	0	270	153	373
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA	pt+ov
Protected Phases	1	6		5	2			8			4	1 4
Permitted Phases							8			4		
Actuated Green, G (s)	14.3	41.2		2.6	29.5			22.2		22.2	22.2	41.5
Effective Green, g (s)	14.3	41.2		2.6	29.5			22.2		22.2	22.2	36.5
Actuated g/C Ratio	0.18	0.52		0.03	0.37			0.28		0.28	0.28	0.46
Clearance Time (s)	3.5	5.5		3.5	5.5			5.0		5.0	5.0	
Vehicle Extension (s)	2.5	4.5		1.5	4.5			2.5		3.0	3.0	
Lane Grp Cap (vph)	613	1794		57	1269			795		303	516	722
v/s Ratio Prot	c0.19	0.31		0.02	c0.28						0.08	0.24
v/s Ratio Perm								0.08		c0.25		
v/c Ratio	1.09	0.61		0.51	0.76			0.30		0.89	0.30	0.52
Uniform Delay, d1	32.8	13.7		38.1	22.2			22.8		27.7	22.8	15.5
Progression Factor	1.00	1.00		1.00	1.00			1.00		0.56	0.51	0.42
Incremental Delay, d2	62.6	1.5		2.6	4.3			0.2		18.9	0.2	0.3
Delay (s)	95.5	15.2		40.7	26.5			22.9		34.5	11.9	6.9
Level of Service	F	B		D	C			C		C	B	A
Approach Delay (s)		45.5			26.9			22.9			16.8	
Approach LOS		D			C			C			B	

Intersection Summary			
HCM 2000 Control Delay	32.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	80.6%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	209	235	163	33	26	936
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	227	255	177	36	28	1017
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						637
pX, platoon unblocked						
vC, conflicting volume	1269	195			213	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1269	195			213	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	0	70			98	
cM capacity (veh/h)	182	846			1357	

Direction, Lane #	WB 1	WB 2	NB 1	SB 1	SB 2
Volume Total	227	255	213	28	1017
Volume Left	227	0	0	28	0
Volume Right	0	255	36	0	0
cSH	182	846	1700	1357	1700
Volume to Capacity	1.25	0.30	0.13	0.02	0.60
Queue Length 95th (ft)	312	32	0	2	0
Control Delay (s)	200.2	11.1	0.0	7.7	0.0
Lane LOS	F	B		A	
Approach Delay (s)	100.1		0.0	0.2	
Approach LOS	F				

Intersection Summary			
Average Delay	27.9		
Intersection Capacity Utilization	67.5%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	23	473	73	21	72	12
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	25	514	79	23	78	13
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)	469					
pX, platoon unblocked						
vC, conflicting volume			539		195	25
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			539		195	25
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			92		89	99
cM capacity (veh/h)			1025		715	1045

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	25	514	87	15	91
Volume Left	0	0	79	0	78
Volume Right	0	514	0	0	13
cSH	1700	1700	1025	1700	749
Volume to Capacity	0.01	0.30	0.08	0.01	0.12
Queue Length 95th (ft)	0	0	6	0	10
Control Delay (s)	0.0	0.0	8.1	0.0	10.5
Lane LOS			A		B
Approach Delay (s)	0.0		6.9		10.5
Approach LOS					B

Intersection Summary			
Average Delay	2.3		
Intersection Capacity Utilization	40.0%	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)	67	498	40	44	621	86	59	362	20	78	493	89
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0		4.0	5.0		4.0	5.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.99		1.00	0.98		1.00	0.99		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3496		1770	3476		1770	3495		1770	3454	
Flt Permitted	0.18	1.00		0.23	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	344	3496		438	3476		1770	3495		1770	3454	
Peak-hour factor, PHF	0.76	0.77	0.69	0.57	0.89	0.91	0.76	0.91	0.55	0.70	0.84	0.79
Adj. Flow (vph)	88	647	58	77	698	95	78	398	36	111	587	113
RTOR Reduction (vph)	0	8	0	0	13	0	0	6	0	0	14	0
Lane Group Flow (vph)	88	697	0	77	780	0	78	428	0	111	686	0
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)	32.4	32.4		32.4	32.4		8.5	41.3		12.3	45.1	
Effective Green, g (s)	32.4	32.4		32.4	32.4		8.5	41.3		12.3	45.1	
Actuated g/C Ratio	0.32	0.32		0.32	0.32		0.08	0.41		0.12	0.45	
Clearance Time (s)	5.0	5.0		5.0	5.0		4.0	5.0		4.0	5.0	
Vehicle Extension (s)	3.5	3.5		3.5	3.5		2.0	4.0		2.0	4.0	
Lane Grp Cap (vph)	111	1132		141	1126		150	1443		217	1557	
v/s Ratio Prot		0.20			0.22		0.04	0.12		c0.06	c0.20	
v/s Ratio Perm	c0.26			0.18								
v/c Ratio	0.79	0.62		0.55	0.69		0.52	0.30		0.51	0.44	
Uniform Delay, d1	30.7	28.5		27.8	29.5		43.8	19.6		41.0	18.8	
Progression Factor	1.00	1.00		1.62	1.58		1.00	1.00		1.00	1.00	
Incremental Delay, d2	31.8	1.1		4.3	1.7		1.5	0.5		0.8	0.9	
Delay (s)	62.5	29.6		49.3	48.3		45.3	20.2		41.9	19.7	
Level of Service	E	C		D	D		D	C		D	B	
Approach Delay (s)		33.2			48.4			24.0			22.7	
Approach LOS		C			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	33.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	60.5%	ICU Level of Service	B
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)	115	474	165	153	484	84	106	667	131	95	669	91
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	5.0		3.0	5.0		3.0	5.0	5.0	3.0	5.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	0.96		1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	3383		1770	3453		1770	3539	1583	1770	3539	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	3383		1770	3453		1770	3539	1583	1770	3539	1583
Peak-hour factor, PHF	0.76	0.86	0.72	0.91	0.94	0.84	0.95	0.85	0.94	0.88	0.89	0.90
Adj. Flow (vph)	151	551	229	168	515	100	112	785	139	108	752	101
RTOR Reduction (vph)	0	42	0	0	15	0	0	0	95	0	0	101
Lane Group Flow (vph)	151	738	0	168	600	0	112	785	44	108	752	0
Turn Type	Prot	NA		Prot	NA		Prot	NA	Perm	Prot	NA	NA
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases									8			
Actuated Green, G (s)	11.0	30.7		12.3	32.0		8.9	31.8	31.8	9.2	32.1	0.0
Effective Green, g (s)	11.0	30.7		12.3	32.0		8.9	31.8	31.8	9.2	32.1	0.0
Actuated g/C Ratio	0.11	0.31		0.12	0.32		0.09	0.32	0.32	0.09	0.32	0.00
Clearance Time (s)	3.0	5.0		3.0	5.0		3.0	5.0	5.0	3.0	5.0	
Vehicle Extension (s)	1.5	4.0		1.5	4.0		1.5	4.0	4.0	1.5	4.0	
Lane Grp Cap (vph)	194	1038		217	1104		157	1125	503	162	1136	0
v/s Ratio Prot	0.09	c0.22		c0.09	0.17		0.06	c0.22		0.06	c0.21	
v/s Ratio Perm									0.03			
v/c Ratio	0.78	0.71		0.77	0.54		0.71	0.70	0.09	0.67	0.66	0.00
Uniform Delay, d1	43.3	30.7		42.5	28.0		44.3	29.9	23.9	43.9	29.3	50.0
Progression Factor	0.69	0.88		1.00	1.00		1.00	1.00	1.00	1.02	0.97	1.00
Incremental Delay, d2	15.3	3.9		14.4	1.9		12.0	2.1	0.1	4.5	0.9	0.0
Delay (s)	45.1	30.9		56.9	29.9		56.3	31.9	24.0	49.1	29.2	50.0
Level of Service	D	C		E	C		E	C	C	D	C	D
Approach Delay (s)		33.2			35.7			33.5			33.6	
Approach LOS		C			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	33.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0
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)	158	585	66	64	508	98	38	459	48	122	559	85
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.98		1.00	0.98		1.00	0.99		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3471		1770	3453		1770	3487		1770	3469	
Flt Permitted	0.29	1.00		0.26	1.00		0.34	1.00		0.40	1.00	
Satd. Flow (perm)	534	3471		494	3453		627	3487		746	3469	
Peak-hour factor, PHF	0.92	0.93	0.72	0.73	0.89	0.88	0.73	0.90	0.86	0.90	0.94	0.93
Adj. Flow (vph)	172	629	92	88	571	111	52	510	56	136	595	91
RTOR Reduction (vph)	0	12	0	0	16	0	0	8	0	0	12	0
Lane Group Flow (vph)	172	709	0	88	666	0	52	558	0	136	674	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	38.4	38.4		38.4	38.4		51.6	51.6		51.6	51.6	
Effective Green, g (s)	38.4	38.4		38.4	38.4		51.6	51.6		51.6	51.6	
Actuated g/C Ratio	0.38	0.38		0.38	0.38		0.52	0.52		0.52	0.52	
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		4.0	4.0		3.0	3.0	
Lane Grp Cap (vph)	205	1332		189	1325		323	1799		384	1790	
v/s Ratio Prot		0.20			0.19			0.16			c0.19	
v/s Ratio Perm	c0.32			0.18			0.08			0.18		
v/c Ratio	0.84	0.53		0.47	0.50		0.16	0.31		0.35	0.38	
Uniform Delay, d1	28.0	23.8		23.1	23.5		12.8	13.9		14.3	14.5	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		0.53	0.46	
Incremental Delay, d2	24.8	0.4		1.8	0.3		1.1	0.4		0.9	0.2	
Delay (s)	52.8	24.3		24.9	23.8		13.8	14.4		8.5	6.9	
Level of Service	D	C		C	C		B	B		A	A	
Approach Delay (s)		29.8			23.9			14.3			7.1	
Approach LOS		C			C			B			A	

Intersection Summary			
HCM 2000 Control Delay	19.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	69.1%	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)	45	630	99	86	497	72	96	369	94	57	302	63
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0		4.5	4.5		4.5	4.5	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.98		1.00	0.98		1.00	0.97		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3473		1770	3477		1770	3450		1770	3446	
Flt Permitted	0.34	1.00		0.28	1.00		0.30	1.00		0.20	1.00	
Satd. Flow (perm)	635	3473		527	3477		552	3450		373	3446	
Peak-hour factor, PHF	0.63	0.78	0.85	0.78	0.73	0.79	0.82	0.68	0.86	0.85	0.80	0.79
Adj. Flow (vph)	71	808	116	110	681	91	117	543	109	67	378	80
RTOR Reduction (vph)	0	11	0	0	8	0	0	17	0	0	18	0
Lane Group Flow (vph)	71	913	0	110	764	0	117	635	0	67	440	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Actuated Green, G (s)	70.5	70.5		70.5	70.5		20.0	20.0		20.0	20.0	
Effective Green, g (s)	70.5	70.5		70.5	70.5		20.0	20.0		20.0	20.0	
Actuated g/C Ratio	0.70	0.70		0.70	0.70		0.20	0.20		0.20	0.20	
Clearance Time (s)	5.0	5.0		5.0	5.0		4.5	4.5		4.5	4.5	
Vehicle Extension (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Grp Cap (vph)	447	2448		371	2451		110	690		74	689	
v/s Ratio Prot		c0.26			0.22			0.18			0.13	
v/s Ratio Perm	0.11			0.21			c0.21			0.18		
v/c Ratio	0.16	0.37		0.30	0.31		1.06	0.92		0.91	0.64	
Uniform Delay, d1	4.9	5.9		5.5	5.6		40.0	39.2		39.1	36.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		0.81	0.82	
Incremental Delay, d2	0.8	0.4		2.0	0.3		104.0	17.9		68.7	2.0	
Delay (s)	5.7	6.3		7.5	5.9		144.0	57.1		100.5	32.1	
Level of Service	A	A		A	A		F	E		F	C	
Approach Delay (s)		6.3			6.1			70.3			40.8	
Approach LOS		A			A			E			D	

Intersection Summary			
HCM 2000 Control Delay	27.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	9.5
Intersection Capacity Utilization	61.3%	ICU Level of Service	B
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)	146	689	58	38	502	157	21	278	60	153	205	137
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5		5.5	5.5		4.5	4.5		4.5	4.5	4.5
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.99		1.00	0.96		1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3498		1770	3413		1770	1813		1770	1863	1583
Flt Permitted	0.36	1.00		0.31	1.00		0.62	1.00		0.41	1.00	1.00
Satd. Flow (perm)	668	3498		575	3413		1151	1813		765	1863	1583
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)	159	749	63	41	546	171	23	302	65	166	223	149
RTOR Reduction (vph)	0	11	0	0	55	0	0	15	0	0	0	101
Lane Group Flow (vph)	159	801	0	41	662	0	23	352	0	166	223	48
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		2			2			4			4	
Permitted Phases	2			2			4			4		4
Actuated Green, G (s)	22.0	22.0		22.0	22.0		15.2	15.2		15.2	15.2	15.2
Effective Green, g (s)	22.0	22.0		22.0	22.0		15.2	15.2		15.2	15.2	15.2
Actuated g/C Ratio	0.47	0.47		0.47	0.47		0.32	0.32		0.32	0.32	0.32
Clearance Time (s)	5.5	5.5		5.5	5.5		4.5	4.5		4.5	4.5	4.5
Vehicle Extension (s)	4.0	4.0		4.0	4.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	311	1630		268	1590		370	583		246	599	509
v/s Ratio Prot		0.23			0.19			0.19			0.12	
v/s Ratio Perm	c0.24			0.07			0.02			c0.22		0.03
v/c Ratio	0.51	0.49		0.15	0.42		0.06	0.60		0.67	0.37	0.09
Uniform Delay, d1	8.8	8.7		7.2	8.3		11.1	13.5		13.9	12.3	11.2
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	1.9	0.3		0.4	0.2		0.1	1.8		7.1	0.4	0.1
Delay (s)	10.7	9.0		7.6	8.6		11.1	15.2		21.0	12.7	11.3
Level of Service	B	A		A	A		B	B		C	B	B
Approach Delay (s)		9.3			8.5			15.0			14.9	
Approach LOS		A			A			B			B	

Intersection Summary			
HCM 2000 Control Delay	11.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	47.2	Sum of lost time (s)	10.0
Intersection Capacity Utilization	72.6%	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)	111	1167	21	218	882	74	48	162	400	136	110	105
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	5.5		3.0	5.5		5.0	5.0		5.0	5.0	5.0
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	0.95		0.95	0.95	1.00
Frt	1.00	1.00		1.00	0.99		1.00	0.89		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	0.99	1.00
Satd. Flow (prot)	1770	5072		1770	5027		1770	3161		1681	1759	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	0.99	1.00
Satd. Flow (perm)	1770	5072		1770	5027		1770	3161		1681	1759	1583
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)	121	1268	23	237	959	80	52	176	435	148	120	114
RTOR Reduction (vph)	0	2	0	0	9	0	0	247	0	0	0	99
Lane Group Flow (vph)	121	1289	0	237	1030	0	52	364	0	132	136	15
Turn Type	Prot	NA		Prot	NA		Split	NA		Split	NA	Perm
Protected Phases	1	6		5	2		4	4		8	8	
Permitted Phases												8
Actuated Green, G (s)	9.1	31.1		15.4	37.4		13.5	13.5		11.5	11.5	11.5
Effective Green, g (s)	9.1	31.1		15.4	37.4		13.5	13.5		11.5	11.5	11.5
Actuated g/C Ratio	0.10	0.35		0.17	0.42		0.15	0.15		0.13	0.13	0.13
Clearance Time (s)	3.0	5.5		3.0	5.5		5.0	5.0		5.0	5.0	5.0
Vehicle Extension (s)	1.5	4.5		1.5	4.5		2.5	2.5		2.5	2.5	2.5
Lane Grp Cap (vph)	178	1752		302	2088		265	474		214	224	202
v/s Ratio Prot	0.07	c0.25		c0.13	0.20		0.03	c0.12		c0.08	0.08	
v/s Ratio Perm												0.01
v/c Ratio	0.68	0.74		0.78	0.49		0.20	0.90dr		0.62	0.61	0.07
Uniform Delay, d1	39.0	25.8		35.7	19.3		33.5	36.7		37.2	37.1	34.6
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	7.9	2.8		11.6	0.8		0.3	7.0		4.5	3.9	0.1
Delay (s)	46.9	28.6		47.4	20.2		33.8	43.7		41.6	41.0	34.7
Level of Service	D	C		D	C		C	D		D	D	C
Approach Delay (s)		30.2			25.2			43.0			39.3	
Approach LOS		C			C			D			D	

Intersection Summary			
HCM 2000 Control Delay	31.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	18.5
Intersection Capacity Utilization	75.4%	ICU Level of Service	D
Analysis Period (min)	15		
dr Defacto Right Lane. Recode with 1 though lane as a right lane.			
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	580	1092	309	25	425	150	340	314	66	137	243	355
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	6.0		3.0	6.0		3.0	6.0		3.0	6.0	6.0
Lane Util. Factor	0.97	0.95		1.00	0.91		0.97	0.95		1.00	0.95	1.00
Frt	1.00	0.97		1.00	0.96		1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3433	3422		1770	4886		3433	3447		1770	3539	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3433	3422		1770	4886		3433	3447		1770	3539	1583
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)	630	1187	336	27	462	163	370	341	72	149	264	386
RTOR Reduction (vph)	0	22	0	0	56	0	0	16	0	0	0	321
Lane Group Flow (vph)	630	1501	0	27	569	0	370	397	0	149	264	65
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	Perm
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases												4
Actuated Green, G (s)	21.6	47.9		2.7	29.0		12.8	17.3		12.0	16.5	16.5
Effective Green, g (s)	21.6	47.9		2.7	29.0		12.8	17.3		12.0	16.5	16.5
Actuated g/C Ratio	0.22	0.49		0.03	0.30		0.13	0.18		0.12	0.17	0.17
Clearance Time (s)	3.0	6.0		3.0	6.0		3.0	6.0		3.0	6.0	6.0
Vehicle Extension (s)	1.5	4.0		1.5	4.0		1.5	4.0		1.5	4.0	4.0
Lane Grp Cap (vph)	757	1674		48	1447		448	609		216	596	266
v/s Ratio Prot	c0.18	c0.44		0.02	0.12		c0.11	c0.12		0.08	0.07	
v/s Ratio Perm												0.04
v/c Ratio	0.83	0.90		0.56	0.39		0.83	0.65		0.69	0.44	0.24
Uniform Delay, d1	36.4	22.7		47.0	27.4		41.5	37.5		41.2	36.6	35.3
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	7.5	6.9		8.7	0.2		11.3	2.8		7.1	0.7	0.7
Delay (s)	43.9	29.6		55.7	27.7		52.7	40.3		48.3	37.3	36.0
Level of Service	D	C		E	C		D	D		D	D	D
Approach Delay (s)		33.8			28.8			46.2			38.7	
Approach LOS		C			C			D			D	

Intersection Summary			
HCM 2000 Control Delay	36.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	97.9	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	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	208	238	753	276	265	557
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	0.97	0.88	0.95		1.00	0.95
Frt	1.00	0.85	0.96		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	3433	2787	3397		1770	3539
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	3433	2787	3397		1770	3539
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	226	259	818	300	288	605
RTOR Reduction (vph)	0	224	23	0	0	0
Lane Group Flow (vph)	226	35	1095	0	288	605
Turn Type	NA	Prot	NA		Prot	NA
Protected Phases	8	8	2		1	6
Permitted Phases						
Actuated Green, G (s)	12.2	12.2	39.7		19.3	63.0
Effective Green, g (s)	12.2	12.2	39.7		19.3	63.0
Actuated g/C Ratio	0.14	0.14	0.44		0.21	0.70
Clearance Time (s)	4.0	4.0	4.0		4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	464	376	1495		378	2471
v/s Ratio Prot	c0.07	0.01	c0.32		c0.16	0.17
v/s Ratio Perm						
v/c Ratio	0.49	0.09	0.73		0.76	0.24
Uniform Delay, d1	36.1	34.2	20.9		33.3	4.9
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	0.8	0.1	3.2		8.8	0.2
Delay (s)	36.9	34.3	24.1		42.1	5.2
Level of Service	D	C	C		D	A
Approach Delay (s)	35.5		24.1			17.1
Approach LOS	D		C			B

Intersection Summary			
HCM 2000 Control Delay	23.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	90.2	Sum of lost time (s)	16.0
Intersection Capacity Utilization	60.3%	ICU Level of Service	B
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)	147	292	97	83	250	70	105	609	60	121	698	186
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		3.0	5.5		3.0	5.5	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.96		1.00	0.96		1.00	0.98		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3386		1770	3387		1770	3484		1770	3429	
Flt Permitted	0.42	1.00		0.35	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	773	3386		644	3387		1770	3484		1770	3429	
Peak-hour factor, PHF	0.92	0.90	0.74	0.84	0.91	0.63	0.77	0.89	0.75	0.76	0.85	0.86
Adj. Flow (vph)	160	324	131	99	275	111	136	684	80	159	821	216
RTOR Reduction (vph)	0	58	0	0	57	0	0	10	0	0	20	0
Lane Group Flow (vph)	160	397	0	99	329	0	136	754	0	159	1017	0
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		6			2		7	4		3	8	
Permitted Phases	6			2								
Actuated Green, G (s)	18.5	18.5		18.5	18.5		9.6	40.4		8.6	39.4	
Effective Green, g (s)	18.5	18.5		18.5	18.5		9.6	40.4		8.6	39.4	
Actuated g/C Ratio	0.23	0.23		0.23	0.23		0.12	0.50		0.11	0.49	
Clearance Time (s)	4.0	4.0		4.0	4.0		3.0	5.5		3.0	5.5	
Vehicle Extension (s)	2.5	2.5		2.5	2.5		1.0	4.5		1.0	4.5	
Lane Grp Cap (vph)	178	783		148	783		212	1759		190	1688	
v/s Ratio Prot		0.12			0.10		0.08	0.22		c0.09	c0.30	
v/s Ratio Perm	c0.21			0.15								
v/c Ratio	0.90	0.51		0.67	0.42		0.64	0.43		0.84	0.60	
Uniform Delay, d1	29.8	26.8		28.0	26.2		33.6	12.5		35.0	14.6	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	39.5	0.4		9.9	0.3		4.9	0.8		25.1	1.6	
Delay (s)	69.4	27.2		37.8	26.5		38.5	13.3		60.1	16.2	
Level of Service	E	C		D	C		D	B		E	B	
Approach Delay (s)		38.1			28.8			17.1			22.1	
Approach LOS		D			C			B			C	

Intersection Summary			
HCM 2000 Control Delay	24.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	12.5
Intersection Capacity Utilization	62.9%	ICU Level of Service	B
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)	88	193	87	109	202	46	98	607	82	39	612	108
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	3.5	4.5	4.5	3.5	4.5	4.5
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1770	3539	1583	1770	3539	1583
Flt Permitted	0.61	1.00	1.00	0.62	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1144	3539	1583	1155	3539	1583	1770	3539	1583	1770	3539	1583
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)	96	210	95	118	220	50	107	660	89	42	665	117
RTOR Reduction (vph)	0	0	76	0	0	40	0	0	44	0	0	69
Lane Group Flow (vph)	96	210	19	118	220	10	107	660	45	42	665	48
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases		2			6		7	4		3	8	
Permitted Phases	2		2	6		6			4			8
Actuated Green, G (s)	9.2	9.2	9.2	9.2	9.2	9.2	5.5	23.0	23.0	1.3	18.8	18.8
Effective Green, g (s)	9.2	9.2	9.2	9.2	9.2	9.2	5.5	23.0	23.0	1.3	18.8	18.8
Actuated g/C Ratio	0.20	0.20	0.20	0.20	0.20	0.20	0.12	0.51	0.51	0.03	0.41	0.41
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	3.5	4.5	4.5	3.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	2.0	2.5	2.5	2.0	2.5	2.5
Lane Grp Cap (vph)	231	715	320	233	715	320	213	1788	800	50	1462	654
v/s Ratio Prot		0.06			0.06		c0.06	0.19		0.02	c0.19	
v/s Ratio Perm	0.08		0.01	c0.10		0.01			0.03			0.03
v/c Ratio	0.42	0.29	0.06	0.51	0.31	0.03	0.50	0.37	0.06	0.84	0.45	0.07
Uniform Delay, d1	15.8	15.4	14.7	16.1	15.4	14.6	18.7	6.8	5.7	22.0	9.6	8.1
Progression Factor	1.00	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	0.2	0.1	1.7	0.2	0.0	0.7	0.1	0.0	68.8	0.2	0.0
Delay (s)	17.0	15.6	14.7	17.9	15.7	14.6	19.4	6.9	5.7	90.8	9.8	8.1
Level of Service	B	B	B	B	B	B	B	A	A	F	A	A
Approach Delay (s)		15.7			16.2			8.4			13.7	
Approach LOS		B			B			A			B	

Intersection Summary			
HCM 2000 Control Delay	12.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	45.5	Sum of lost time (s)	12.0
Intersection Capacity Utilization	48.0%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

APPENDIX C: FUTURE LOS RESULTS

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	50	610	330	340	420	40	320	80	130	120	210	80
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.7	5.3	5.3	3.7	4.9		3.7	4.9		3.7	4.9	4.9
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		1.00	0.95		1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	0.99		1.00	0.91		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)	1770	3539	1583	1770	3493		1770	3210		1770	3539	1583
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)	1770	3539	1583	1770	3493		1770	3210		1770	3539	1583
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)	53	642	347	358	442	42	337	84	137	126	221	84
RTOR Reduction (vph)	0	0	255	0	8	0	0	113	0	0	0	70
Lane Group Flow (vph)	53	642	92	358	476	0	337	108	0	126	221	14
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)	6.7	21.1	21.1	18.4	33.2		10.0	14.2		8.7	12.9	12.9
Effective Green, g (s)	6.7	21.1	21.1	18.4	33.2		10.0	14.2		8.7	12.9	12.9
Actuated g/C Ratio	0.08	0.26	0.26	0.23	0.42		0.12	0.18		0.11	0.16	0.16
Clearance Time (s)	3.7	5.3	5.3	3.7	4.9		3.7	4.9		3.7	4.9	4.9
Vehicle Extension (s)	3.0	2.5	2.5	3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	148	933	417	407	1449		221	569		192	570	255
v/s Ratio Prot	0.03	c0.18		c0.20	0.14		c0.19	0.03		0.07	c0.06	
v/s Ratio Perm			0.06									0.01
v/c Ratio	0.36	0.69	0.22	0.88	0.33		1.52	0.19		0.66	0.39	0.05
Uniform Delay, d1	34.6	26.5	23.0	29.7	15.8		35.0	28.0		34.2	30.0	28.4
Progression Factor	1.00	1.00	1.00	1.00	1.00		0.93	1.21		1.00	1.00	1.00
Incremental Delay, d2	1.5	4.1	1.2	19.0	0.6		257.4	0.2		7.8	0.4	0.1
Delay (s)	36.1	30.6	24.2	48.7	16.5		289.9	34.1		42.1	30.5	28.5
Level of Service	D	C	C	D	B		F	C		D	C	C
Approach Delay (s)		28.8			30.2			188.6			33.5	
Approach LOS		C			C			F			C	

Intersection Summary			
HCM 2000 Control Delay	60.9	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	17.6
Intersection Capacity Utilization	74.4%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
2: Garey Ave & Arrow Hwy

2/15/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	50	400	160	130	460	290	150	590	130	220	970	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	5.0		3.5	5.0		3.5	5.0		3.5	5.0	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	0.95		1.00	0.95	
Frt	1.00	0.96		1.00	0.94		1.00	0.97		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	4868		1770	4790		1770	3443		1770	3513	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	4868		1770	4790		1770	3443		1770	3513	
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)	53	421	168	137	484	305	158	621	137	232	1021	53
RTOR Reduction (vph)	0	92	0	0	140	0	0	19	0	0	4	0
Lane Group Flow (vph)	53	497	0	137	649	0	158	739	0	232	1070	0
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	3.7	18.1		6.6	21.0		6.6	30.3		6.6	30.3	
Effective Green, g (s)	3.7	18.1		6.6	21.0		6.6	30.3		6.6	30.3	
Actuated g/C Ratio	0.05	0.23		0.08	0.27		0.08	0.39		0.08	0.39	
Clearance Time (s)	3.5	5.0		3.5	5.0		3.5	5.0		3.5	5.0	
Vehicle Extension (s)	2.0	3.0		2.0	3.0		2.0	3.0		2.0	3.0	
Lane Grp Cap (vph)	83	1121		148	1279		148	1327		148	1354	
v/s Ratio Prot	0.03	0.10		c0.08	c0.14		0.09	0.21		c0.13	c0.30	
v/s Ratio Perm												
v/c Ratio	0.64	0.44		0.93	0.51		1.07	0.56		1.57	0.79	
Uniform Delay, d1	36.8	25.9		35.8	24.4		36.0	18.9		36.0	21.3	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	11.3	0.3		51.2	0.3		93.1	1.7		285.5	4.8	
Delay (s)	48.0	26.2		87.0	24.7		129.1	20.6		321.5	26.1	
Level of Service	D	C		F	C		F	C		F	C	
Approach Delay (s)		28.0			33.9			39.3			78.6	
Approach LOS		C			C			D			E	

Intersection Summary			
HCM 2000 Control Delay	49.6	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	78.6	Sum of lost time (s)	17.0
Intersection Capacity Utilization	70.4%	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)	290	490	190	160	650	140	240	830	190	140	970	410
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	5.0		3.5	5.0	5.0	3.5	5.0		3.5	5.0	5.0
Lane Util. Factor	1.00	0.91		1.00	0.95	1.00	1.00	0.95		1.00	0.95	1.00
Frt	1.00	0.96		1.00	1.00	0.85	1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	4872		1770	3539	1583	1770	3440		1770	3539	1583
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	4872		1770	3539	1583	1770	3440		1770	3539	1583
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)	305	516	200	168	684	147	253	874	200	147	1021	432
RTOR Reduction (vph)	0	69	0	0	0	116	0	20	0	0	0	156
Lane Group Flow (vph)	305	647	0	168	684	32	253	1054	0	147	1021	276
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA		Prot	NA	Perm
Protected Phases	7	4		3	8		1	6		5	2	
Permitted Phases						8						2
Actuated Green, G (s)	15.6	24.3		12.6	21.3	21.3	13.5	35.9		9.6	32.0	32.0
Effective Green, g (s)	15.6	24.3		12.6	21.3	21.3	13.5	35.9		9.6	32.0	32.0
Actuated g/C Ratio	0.16	0.24		0.13	0.21	0.21	0.14	0.36		0.10	0.32	0.32
Clearance Time (s)	3.5	5.0		3.5	5.0	5.0	3.5	5.0		3.5	5.0	5.0
Vehicle Extension (s)	2.0	2.5		2.0	2.5	2.5	2.0	2.5		2.0	2.5	2.5
Lane Grp Cap (vph)	277	1191		224	758	339	240	1242		170	1139	509
v/s Ratio Prot	c0.17	c0.13		0.09	c0.19		c0.14	c0.31		0.08	0.29	
v/s Ratio Perm						0.02						0.17
v/c Ratio	1.10	0.54		0.75	0.90	0.09	1.05	0.85		0.86	0.90	0.54
Uniform Delay, d1	41.9	32.7		41.9	38.0	31.3	43.0	29.2		44.3	32.1	27.7
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	83.9	0.4		11.8	14.0	0.1	73.1	7.3		32.9	11.1	4.1
Delay (s)	125.8	33.1		53.7	52.0	31.4	116.0	36.6		77.1	43.2	31.8
Level of Service	F	C		D	D	C	F	D		E	D	C
Approach Delay (s)		60.8			49.3			51.7			43.2	
Approach LOS		E			D			D			D	

Intersection Summary			
HCM 2000 Control Delay	50.4	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.95		
Actuated Cycle Length (s)	99.4	Sum of lost time (s)	17.0
Intersection Capacity Utilization	89.1%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	EBR2	WBL2	WBL	WBT	WBR	NBL2	NBL	NBT	NBR
Lane Configurations												
Volume (vph)	10	230	20	30	10	80	240	30	200	270	870	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0				4.0	4.0			4.0	4.0	
Lane Util. Factor		0.95				1.00	1.00			1.00	0.95	
Frt		0.97				1.00	0.98			1.00	0.99	
Flt Protected		1.00				0.95	1.00			0.95	1.00	
Satd. Flow (prot)		3441				1770	1831			1770	3510	
Flt Permitted		1.00				0.95	1.00			0.95	1.00	
Satd. Flow (perm)		3441				1770	1831			1770	3510	
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)	11	242	21	32	11	84	253	32	211	284	916	53
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	4	0
Lane Group Flow (vph)	0	306	0	0	0	95	285	0	0	495	965	0
Turn Type	Split	NA			Split	Split	NA		Prot	Prot	NA	
Protected Phases	4	4			8	8	8		5	5	2	
Permitted Phases												
Actuated Green, G (s)		16.0				16.0	16.0			26.0	37.0	
Effective Green, g (s)		16.0				16.0	16.0			26.0	37.0	
Actuated g/C Ratio		0.16				0.16	0.16			0.26	0.37	
Clearance Time (s)		4.0				4.0	4.0			4.0	4.0	
Lane Grp Cap (vph)		550				283	292			460	1298	
v/s Ratio Prot		c0.09				0.05	c0.16			c0.28	0.27	
v/s Ratio Perm												
v/c Ratio		0.56				0.34	0.98			1.08	0.74	
Uniform Delay, d1		38.7				37.3	41.8			37.0	27.4	
Progression Factor		1.00				1.00	1.00			1.00	1.00	
Incremental Delay, d2		4.0				3.2	46.9			63.9	3.9	
Delay (s)		42.8				40.5	88.7			100.9	31.3	
Level of Service		D				D	F			F	C	
Approach Delay (s)		42.8					76.7				54.8	
Approach LOS		D					E				D	

Intersection Summary			
HCM 2000 Control Delay	65.1	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.95		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	87.8%	ICU Level of Service	E
Analysis Period (min)	15		

dr Defacto Right Lane. Recode with 1 though lane as a right lane.

c Critical Lane Group

Movement	SBL	SBT	SBR	SBR2
Lane Configurations				
Volume (vph)	190	430	410	20
Ideal Flow (vphpl)	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		
Lane Util. Factor	1.00	0.95		
Frt	1.00	0.92		
Flt Protected	0.95	1.00		
Satd. Flow (prot)	1770	3274		
Flt Permitted	0.95	1.00		
Satd. Flow (perm)	1770	3274		
Peak-hour factor, PHF	0.95	0.95	0.95	0.95
Adj. Flow (vph)	200	453	432	21
RTOR Reduction (vph)	0	1	0	0
Lane Group Flow (vph)	200	905	0	0
Turn Type	Prot	NA		
Protected Phases	1	6		
Permitted Phases				
Actuated Green, G (s)	15.0	26.0		
Effective Green, g (s)	15.0	26.0		
Actuated g/C Ratio	0.15	0.26		
Clearance Time (s)	4.0	4.0		
Lane Grp Cap (vph)	265	851		
v/s Ratio Prot	0.11	c0.28		
v/s Ratio Perm				
v/c Ratio	0.75	1.10dr		
Uniform Delay, d1	40.7	37.0		
Progression Factor	1.00	1.00		
Incremental Delay, d2	18.0	49.0		
Delay (s)	58.7	86.0		
Level of Service	E	F		
Approach Delay (s)		81.0		
Approach LOS		F		

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	240	220	120	70	260	150	100	740	30	80	860	120
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.5	5.5	4.0	5.5	5.5	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95		1.00	0.95	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99		1.00	0.98	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	1770	3518		1770	3474	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.13	1.00		0.22	1.00	
Satd. Flow (perm)	1770	1863	1583	1770	1863	1583	238	3518		415	3474	
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)	253	232	126	74	274	158	105	779	32	84	905	126
RTOR Reduction (vph)	0	0	79	0	0	76	0	4	0	0	13	0
Lane Group Flow (vph)	253	232	47	74	274	82	105	807	0	84	1018	0
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			4			8	
Permitted Phases			2			6	4			8		
Actuated Green, G (s)	12.2	30.8	30.8	6.2	24.8	24.8	32.9	32.9		32.9	32.9	
Effective Green, g (s)	12.2	30.8	30.8	6.2	24.8	24.8	32.9	32.9		32.9	32.9	
Actuated g/C Ratio	0.15	0.37	0.37	0.07	0.30	0.30	0.39	0.39		0.39	0.39	
Clearance Time (s)	4.0	5.5	5.5	4.0	5.5	5.5	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	1.5	2.0	2.0	1.5	2.0	2.0	2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	258	688	584	131	553	470	93	1387		163	1370	
v/s Ratio Prot	c0.14	0.12		0.04	c0.15			0.23			0.29	
v/s Ratio Perm			0.03			0.05	c0.44			0.20		
v/c Ratio	0.98	0.34	0.08	0.56	0.50	0.17	1.13	0.58		0.52	0.74	
Uniform Delay, d1	35.5	18.9	17.1	37.3	24.1	21.7	25.3	19.8		19.2	21.6	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	50.3	1.3	0.3	3.3	3.2	0.8	132.4	0.4		1.1	1.9	
Delay (s)	85.8	20.3	17.4	40.6	27.3	22.5	157.6	20.3		20.3	23.6	
Level of Service	F	C	B	D	C	C	F	C		C	C	
Approach Delay (s)		46.8			27.8			36.0			23.3	
Approach LOS		D			C			D			C	

Intersection Summary			
HCM 2000 Control Delay	32.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	83.4	Sum of lost time (s)	13.5
Intersection Capacity Utilization	74.7%	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)	310	630	60	0	1300	80	550	650	190	160	0	660
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.7	4.9			4.9	4.9	4.9	4.9		4.9		4.9
Lane Util. Factor	0.97	0.95			0.95	1.00	1.00	0.95		1.00		0.88
Frt	1.00	0.99			1.00	0.85	1.00	0.97		1.00		0.85
Flt Protected	0.95	1.00			1.00	1.00	0.95	1.00		0.95		1.00
Satd. Flow (prot)	3433	3493			3539	1583	1770	3419		1770		2787
Flt Permitted	0.95	1.00			1.00	1.00	0.95	1.00		0.20		1.00
Satd. Flow (perm)	3433	3493			3539	1583	1770	3419		376		2787
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)	326	663	63	0	1368	84	579	684	200	168	0	695
RTOR Reduction (vph)	0	6	0	0	0	29	0	21	0	0	0	193
Lane Group Flow (vph)	326	720	0	0	1368	55	579	863	0	168	0	502
Turn Type	Prot	NA			NA	Perm	Perm	NA		D.Pm		custom
Protected Phases	5	2			6			4				
Permitted Phases						6	4			4		4
Actuated Green, G (s)	10.3	64.1			50.1	50.1	56.1	56.1		56.1		56.1
Effective Green, g (s)	10.3	64.1			50.1	50.1	56.1	56.1		56.1		56.1
Actuated g/C Ratio	0.08	0.49			0.39	0.39	0.43	0.43		0.43		0.43
Clearance Time (s)	3.7	4.9			4.9	4.9	4.9	4.9		4.9		4.9
Vehicle Extension (s)	2.5	5.0			5.0	5.0	4.0	4.0		4.0		4.0
Lane Grp Cap (vph)	271	1722			1363	610	763	1475		162		1202
v/s Ratio Prot	c0.09	0.21			c0.39			0.25				
v/s Ratio Perm						0.03	0.33			c0.45		0.18
v/c Ratio	1.20	0.42			1.00	0.09	0.76	0.59		1.04		0.42
Uniform Delay, d1	59.8	21.0			39.9	25.4	31.2	28.1		37.0		25.6
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00		1.00		1.00
Incremental Delay, d2	121.0	0.7			25.3	0.3	4.6	0.7		80.8		0.3
Delay (s)	180.9	21.8			65.2	25.7	35.9	28.8		117.8		25.9
Level of Service	F	C			E	C	D	C		F		C
Approach Delay (s)		71.1			62.9			31.6			43.8	
Approach LOS		E			E			C			D	

Intersection Summary			
HCM 2000 Control Delay	51.8	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.04		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	101.7%	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)	90	430	100	100	600	130	140	700	70	110	840	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.0		3.0	4.5		3.0	4.5		3.0	4.5	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.97		1.00	0.97		1.00	0.99		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3439		1770	3445		1770	3491		1770	3504	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3439		1770	3445		1770	3491		1770	3504	
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)	95	453	105	105	632	137	147	737	74	116	884	63
RTOR Reduction (vph)	0	20	0	0	18	0	0	7	0	0	5	0
Lane Group Flow (vph)	95	538	0	105	751	0	147	804	0	116	942	0
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	6.9	24.8		7.9	25.3		10.7	38.8		7.7	35.8	
Effective Green, g (s)	6.9	24.8		7.9	25.3		10.7	38.8		7.7	35.8	
Actuated g/C Ratio	0.07	0.26		0.08	0.27		0.11	0.41		0.08	0.38	
Clearance Time (s)	3.0	4.0		3.0	4.5		3.0	4.5		3.0	4.5	
Vehicle Extension (s)	1.5	4.5		1.5	4.5		1.5	4.5		1.5	4.5	
Lane Grp Cap (vph)	130	910		149	930		202	1445		145	1338	
v/s Ratio Prot	0.05	0.16		c0.06	c0.22		0.08	c0.23		c0.07	c0.27	
v/s Ratio Perm												
v/c Ratio	0.73	0.59		0.70	0.81		0.73	0.56		0.80	0.70	
Uniform Delay, d1	42.5	30.0		41.8	31.9		40.1	20.9		42.2	24.5	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	16.5	1.4		11.7	5.8		10.5	1.6		24.9	3.1	
Delay (s)	59.0	31.4		53.4	37.7		50.6	22.4		67.1	27.6	
Level of Service	E	C		D	D		D	C		E	C	
Approach Delay (s)		35.4			39.6			26.8			31.9	
Approach LOS		D			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	33.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	93.7	Sum of lost time (s)	15.0
Intersection Capacity Utilization	72.8%	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)	50	400	60	60	560	100	100	750	60	160	1010	80
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.5		3.0	4.5		3.0	5.0		3.0	5.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.98		1.00	0.98		1.00	0.99		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3470		1770	3459		1770	3500		1770	3500	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3470		1770	3459		1770	3500		1770	3500	
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)	53	421	63	63	589	105	105	789	63	168	1063	84
RTOR Reduction (vph)	0	14	0	0	17	0	0	8	0	0	7	0
Lane Group Flow (vph)	53	470	0	63	677	0	105	844	0	168	1140	0
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases												
Actuated Green, G (s)	2.8	24.5		3.8	25.5		5.3	23.3		10.1	28.1	
Effective Green, g (s)	2.8	24.5		3.8	25.5		5.3	23.3		10.1	28.1	
Actuated g/C Ratio	0.04	0.32		0.05	0.33		0.07	0.30		0.13	0.36	
Clearance Time (s)	3.0	4.5		3.0	4.5		3.0	5.0		3.0	5.0	
Vehicle Extension (s)	1.5	2.5		1.5	2.5		1.5	2.5		1.5	2.5	
Lane Grp Cap (vph)	64	1101		87	1142		121	1056		231	1273	
v/s Ratio Prot	0.03	0.14		c0.04	c0.20		c0.06	0.24		c0.09	c0.33	
v/s Ratio Perm												
v/c Ratio	0.83	0.43		0.72	0.59		0.87	0.80		0.73	0.90	
Uniform Delay, d1	37.0	20.8		36.2	21.5		35.6	24.8		32.2	23.2	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	54.0	1.2		22.1	2.3		42.6	4.2		9.3	8.4	
Delay (s)	90.9	22.0		58.3	23.8		78.2	29.0		41.5	31.6	
Level of Service	F	C		E	C		E	C		D	C	
Approach Delay (s)		28.8			26.7			34.4			32.9	
Approach LOS		C			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	31.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	77.2	Sum of lost time (s)	15.5
Intersection Capacity Utilization	72.6%	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)	10	480	200	340	510	10	280	10	350	10	10	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5		3.5	5.5			4.0	4.0		4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00		1.00	
Frt	1.00	0.96		1.00	1.00			1.00	0.85		0.96	
Flt Protected	0.95	1.00		0.95	1.00			0.95	1.00		0.98	
Satd. Flow (prot)	1770	3383		1770	3529			1777	1583		1750	
Flt Permitted	0.45	1.00		0.95	1.00			0.71	1.00		0.89	
Satd. Flow (perm)	833	3383		1770	3529			1322	1583		1584	
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)	11	505	211	358	537	11	295	11	368	11	11	11
RTOR Reduction (vph)	0	76	0	0	2	0	0	0	258	0	8	0
Lane Group Flow (vph)	11	640	0	358	546	0	0	306	110	0	25	0
Turn Type	Perm	NA		Prot	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		6		5	2			4			8	
Permitted Phases	6						4		4	8		
Actuated Green, G (s)	16.5	16.5		12.5	32.5			18.0	18.0		18.0	
Effective Green, g (s)	16.5	16.5		12.5	32.5			18.0	18.0		18.0	
Actuated g/C Ratio	0.28	0.28		0.21	0.54			0.30	0.30		0.30	
Clearance Time (s)	5.5	5.5		3.5	5.5			4.0	4.0		4.0	
Vehicle Extension (s)	4.5	4.5		3.0	4.5			3.0	3.0		3.0	
Lane Grp Cap (vph)	229	930		368	1911			396	474		475	
v/s Ratio Prot		c0.19		c0.20	0.15							
v/s Ratio Perm	0.01							c0.23	0.07		0.02	
v/c Ratio	0.05	0.69		0.97	0.29			0.77	0.23		0.05	
Uniform Delay, d1	16.0	19.4		23.6	7.5			19.1	15.8		14.9	
Progression Factor	1.00	1.00		1.00	1.00			0.64	0.22		1.00	
Incremental Delay, d2	0.4	4.1		39.4	0.4			8.5	0.2		0.0	
Delay (s)	16.4	23.6		63.0	7.8			20.9	3.8		15.0	
Level of Service	B	C		E	A			C	A		B	
Approach Delay (s)		23.5			29.6			11.5			15.0	
Approach LOS		C			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	22.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	72.5%	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)	380	660	20	20	660	190	10	20	10	310	80	570
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	5.5		3.5	5.5			5.0		5.0	5.0	3.5
Lane Util. Factor	0.97	0.95		1.00	0.95			0.95		1.00	1.00	1.00
Frt	1.00	1.00		1.00	0.97			0.96		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.99		0.95	1.00	1.00
Satd. Flow (prot)	3433	3524		1770	3421			3360		1770	1863	1583
Flt Permitted	0.95	1.00		0.95	1.00			0.91		0.73	1.00	1.00
Satd. Flow (perm)	3433	3524		1770	3421			3082		1355	1863	1583
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)	400	695	21	21	695	200	11	21	11	326	84	600
RTOR Reduction (vph)	0	3	0	0	38	0	0	8	0	0	0	27
Lane Group Flow (vph)	400	713	0	21	857	0	0	35	0	326	84	573
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA	pt+ov
Protected Phases	1	6		5	2			8			4	1 4
Permitted Phases							8			4		
Actuated Green, G (s)	8.5	30.1		0.9	22.5			20.1		20.1	20.1	33.6
Effective Green, g (s)	8.5	30.1		0.9	22.5			20.1		20.1	20.1	28.6
Actuated g/C Ratio	0.13	0.46		0.01	0.35			0.31		0.31	0.31	0.44
Clearance Time (s)	3.5	5.5		3.5	5.5			5.0		5.0	5.0	
Vehicle Extension (s)	2.5	4.5		1.5	4.5			2.5		3.0	3.0	
Lane Grp Cap (vph)	448	1629		24	1182			951		418	575	695
v/s Ratio Prot	c0.12	0.20		0.01	c0.25						0.05	c0.36
v/s Ratio Perm								0.01		0.24		
v/c Ratio	0.89	0.44		0.88	0.73			0.04		0.78	0.15	0.82
Uniform Delay, d1	27.9	11.8		32.0	18.6			15.7		20.5	16.3	16.0
Progression Factor	1.00	1.00		1.00	1.00			1.00		1.00	1.00	1.00
Incremental Delay, d2	19.6	0.9		124.9	3.9			0.0		8.9	0.1	7.7
Delay (s)	47.4	12.7		156.9	22.5			15.7		29.4	16.4	23.7
Level of Service	D	B		F	C			B		C	B	C
Approach Delay (s)		25.1			25.6			15.7			24.9	
Approach LOS		C			C			B			C	

Intersection Summary			
HCM 2000 Control Delay	25.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	65.1	Sum of lost time (s)	14.0
Intersection Capacity Utilization	76.7%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	120	140	250	600	330	480
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	126	147	263	632	347	505
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						637
pX, platoon unblocked						
vC, conflicting volume	1779	579			895	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1779	579			895	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	0	71			54	
cM capacity (veh/h)	49	515			758	

Direction, Lane #	WB 1	WB 2	NB 1	SB 1	SB 2
Volume Total	126	147	895	347	505
Volume Left	126	0	0	347	0
Volume Right	0	147	632	0	0
cSH	49	515	1700	758	1700
Volume to Capacity	2.58	0.29	0.53	0.46	0.30
Queue Length 95th (ft)	331	29	0	61	0
Control Delay (s)	892.9	14.8	0.0	13.7	0.0
Lane LOS	F	B		B	
Approach Delay (s)	420.0		0.0	5.6	
Approach LOS	F				

Intersection Summary			
Average Delay	59.2		
Intersection Capacity Utilization	85.0%	ICU Level of Service	E
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	20	260	10	10	860	60
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	21	274	11	11	905	63
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)	469					
pX, platoon unblocked						
vC, conflicting volume			295		47	21
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			295		47	21
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		5	94
cM capacity (veh/h)			1264		949	1051

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	21	274	14	7	968
Volume Left	0	0	11	0	905
Volume Right	0	274	0	0	63
cSH	1700	1700	1264	1700	955
Volume to Capacity	0.01	0.16	0.01	0.00	1.01
Queue Length 95th (ft)	0	0	1	0	498
Control Delay (s)	0.0	0.0	5.9	0.0	53.6
Lane LOS			A		F
Approach Delay (s)	0.0		3.9		53.6
Approach LOS					F

Intersection Summary			
Average Delay	40.5		
Intersection Capacity Utilization	65.2%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	70	450	90	50	490	110	110	780	40	100	590	100
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0		4.0	5.0		4.0	5.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.97		1.00	0.97		1.00	0.99		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3451		1770	3442		1770	3513		1770	3462	
Flt Permitted	0.29	1.00		0.33	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	533	3451		623	3442		1770	3513		1770	3462	
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)	74	474	95	53	516	116	116	821	42	105	621	105
RTOR Reduction (vph)	0	25	0	0	29	0	0	5	0	0	16	0
Lane Group Flow (vph)	74	544	0	53	603	0	116	858	0	105	710	0
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)	18.4	18.4		18.4	18.4		5.3	27.6		5.3	27.6	
Effective Green, g (s)	18.4	18.4		18.4	18.4		5.3	27.6		5.3	27.6	
Actuated g/C Ratio	0.28	0.28		0.28	0.28		0.08	0.42		0.08	0.42	
Clearance Time (s)	5.0	5.0		5.0	5.0		4.0	5.0		4.0	5.0	
Vehicle Extension (s)	3.5	3.5		3.5	3.5		2.0	4.0		2.0	4.0	
Lane Grp Cap (vph)	150	972		175	969		143	1484		143	1463	
v/s Ratio Prot		0.16			c0.18		c0.07	c0.24		0.06	0.21	
v/s Ratio Perm	0.14			0.09								
v/c Ratio	0.49	0.56		0.30	0.62		0.81	0.58		0.73	0.49	
Uniform Delay, d1	19.6	20.0		18.4	20.4		29.5	14.4		29.3	13.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	3.0	0.8		1.2	1.3		27.0	1.6		15.4	1.2	
Delay (s)	22.6	20.8		19.6	21.7		56.5	16.1		44.7	14.8	
Level of Service	C	C		B	C		E	B		D	B	
Approach Delay (s)		21.0			21.6			20.8			18.6	
Approach LOS		C			C			C			B	

Intersection Summary			
HCM 2000 Control Delay	20.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	65.3	Sum of lost time (s)	14.0
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)	90	410	140	100	510	120	180	740	140	60	630	160
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	5.0		3.0	5.0		3.0	5.0		3.0	5.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.96		1.00	0.97		1.00	0.98		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3404		1770	3438		1770	3455		1770	3432	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3404		1770	3438		1770	3455		1770	3432	
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)	95	432	147	105	537	126	189	779	147	63	663	168
RTOR Reduction (vph)	0	48	0	0	29	0	0	21	0	0	31	0
Lane Group Flow (vph)	95	531	0	105	634	0	189	905	0	63	800	0
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												
Actuated Green, G (s)	4.6	20.1		4.6	20.1		8.7	25.8		2.9	20.0	
Effective Green, g (s)	4.6	20.1		4.6	20.1		8.7	25.8		2.9	20.0	
Actuated g/C Ratio	0.07	0.29		0.07	0.29		0.13	0.37		0.04	0.29	
Clearance Time (s)	3.0	5.0		3.0	5.0		3.0	5.0		3.0	5.0	
Vehicle Extension (s)	1.5	4.0		1.5	4.0		1.5	4.0		1.5	4.0	
Lane Grp Cap (vph)	117	985		117	995		221	1284		73	989	
v/s Ratio Prot	0.05	0.16		c0.06	c0.18		c0.11	0.26		0.04	c0.23	
v/s Ratio Perm												
v/c Ratio	0.81	0.54		0.90	0.64		0.86	0.71		0.86	0.81	
Uniform Delay, d1	32.0	20.8		32.2	21.5		29.7	18.6		33.1	22.9	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	31.8	2.1		51.2	3.1		25.3	1.9		59.2	5.2	
Delay (s)	63.8	22.9		83.4	24.6		55.0	20.5		92.3	28.1	
Level of Service	E	C		F	C		E	C		F	C	
Approach Delay (s)		28.6			32.6			26.3			32.7	
Approach LOS		C			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	29.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	69.4	Sum of lost time (s)	16.0
Intersection Capacity Utilization	70.4%	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)	90	390	30	60	620	110	100	870	70	120	610	110
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.99		1.00	0.98		1.00	0.99		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3501		1770	3459		1770	3500		1770	3458	
Flt Permitted	0.26	1.00		0.50	1.00		0.33	1.00		0.22	1.00	
Satd. Flow (perm)	479	3501		923	3459		608	3500		408	3458	
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)	95	411	32	63	653	116	105	916	74	126	642	116
RTOR Reduction (vph)	0	9	0	0	24	0	0	11	0	0	27	0
Lane Group Flow (vph)	95	434	0	63	745	0	105	979	0	126	731	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	15.9	15.9		15.9	15.9		22.9	22.9		22.9	22.9	
Effective Green, g (s)	15.9	15.9		15.9	15.9		22.9	22.9		22.9	22.9	
Actuated g/C Ratio	0.33	0.33		0.33	0.33		0.47	0.47		0.47	0.47	
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		4.0	4.0		3.0	3.0	
Lane Grp Cap (vph)	156	1140		300	1127		285	1642		191	1622	
v/s Ratio Prot		0.12			c0.22			0.28			0.21	
v/s Ratio Perm	0.20			0.07			0.17			c0.31		
v/c Ratio	0.61	0.38		0.21	0.66		0.37	0.60		0.66	0.45	
Uniform Delay, d1	13.8	12.7		11.9	14.1		8.3	9.5		10.0	8.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	6.6	0.2		0.4	1.5		1.1	0.7		8.0	0.2	
Delay (s)	20.4	12.9		12.3	15.6		9.4	10.2		17.9	8.9	
Level of Service	C	B		B	B		A	B		B	A	
Approach Delay (s)		14.2			15.4			10.2			10.2	
Approach LOS		B			B			B			B	

Intersection Summary			
HCM 2000 Control Delay	12.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	48.8	Sum of lost time (s)	10.0
Intersection Capacity Utilization	77.7%	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)	70	430	100	80	530	60	160	570	110	40	470	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0		4.5	4.5		4.5	4.5	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.97		1.00	0.98		1.00	0.98		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3439		1770	3485		1770	3453		1770	3470	
Flt Permitted	0.39	1.00		0.42	1.00		0.38	1.00		0.29	1.00	
Satd. Flow (perm)	718	3439		789	3485		707	3453		535	3470	
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)	74	453	105	84	558	63	168	600	116	42	495	74
RTOR Reduction (vph)	0	27	0	0	12	0	0	33	0	0	24	0
Lane Group Flow (vph)	74	531	0	84	609	0	168	683	0	42	545	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Actuated Green, G (s)	28.1	28.1		28.1	28.1		22.4	22.4		22.4	22.4	
Effective Green, g (s)	28.1	28.1		28.1	28.1		22.4	22.4		22.4	22.4	
Actuated g/C Ratio	0.47	0.47		0.47	0.47		0.37	0.37		0.37	0.37	
Clearance Time (s)	5.0	5.0		5.0	5.0		4.5	4.5		4.5	4.5	
Vehicle Extension (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Grp Cap (vph)	336	1610		369	1632		263	1289		199	1295	
v/s Ratio Prot		0.15			c0.17			0.20			0.16	
v/s Ratio Perm	0.10			0.11			c0.24			0.08		
v/c Ratio	0.22	0.33		0.23	0.37		0.64	0.53		0.21	0.42	
Uniform Delay, d1	9.5	10.0		9.5	10.3		15.5	14.7		12.8	14.0	
Progression Factor	1.00	1.00		0.70	0.66		1.00	1.00		0.19	0.30	
Incremental Delay, d2	1.5	0.5		1.4	0.6		5.6	0.5		0.4	0.2	
Delay (s)	11.0	10.6		8.0	7.4		21.1	15.2		2.9	4.4	
Level of Service	B	B		A	A		C	B		A	A	
Approach Delay (s)		10.6			7.5			16.3			4.3	
Approach LOS		B			A			B			A	

Intersection Summary			
HCM 2000 Control Delay	10.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	9.5
Intersection Capacity Utilization	64.8%	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)	160	440	30	40	510	140	50	340	30	140	260	140
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5		5.5	5.5		4.5	4.5		4.5	4.5	4.5
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.99		1.00	0.97		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3505		1770	3425		1770	1840		1770	1863	1583
Flt Permitted	0.37	1.00		0.47	1.00		0.50	1.00		0.33	1.00	1.00
Satd. Flow (perm)	691	3505		877	3425		927	1840		620	1863	1583
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)	168	463	32	42	537	147	53	358	32	147	274	147
RTOR Reduction (vph)	0	7	0	0	36	0	0	6	0	0	0	101
Lane Group Flow (vph)	168	488	0	42	648	0	53	384	0	147	274	46
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		2			2			4			4	
Permitted Phases	2			2			4			4		4
Actuated Green, G (s)	31.4	31.4		31.4	31.4		18.6	18.6		18.6	18.6	18.6
Effective Green, g (s)	31.4	31.4		31.4	31.4		18.6	18.6		18.6	18.6	18.6
Actuated g/C Ratio	0.52	0.52		0.52	0.52		0.31	0.31		0.31	0.31	0.31
Clearance Time (s)	5.5	5.5		5.5	5.5		4.5	4.5		4.5	4.5	4.5
Vehicle Extension (s)	4.0	4.0		4.0	4.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	361	1834		458	1792		287	570		192	577	490
v/s Ratio Prot		0.14			0.19			0.21			0.15	
v/s Ratio Perm	c0.24			0.05			0.06			c0.24		0.03
v/c Ratio	0.47	0.27		0.09	0.36		0.18	0.67		0.77	0.47	0.09
Uniform Delay, d1	9.0	7.9		7.2	8.4		15.2	18.1		18.7	16.7	14.7
Progression Factor	0.76	0.67		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	4.1	0.3		0.4	0.6		0.3	3.1		16.5	0.6	0.1
Delay (s)	11.0	5.7		7.6	9.0		15.5	21.2		35.2	17.4	14.8
Level of Service	B	A		A	A		B	C		D	B	B
Approach Delay (s)		7.0			8.9			20.5			21.3	
Approach LOS		A			A			C			C	

Intersection Summary			
HCM 2000 Control Delay	13.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	71.6%	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)	190	310	1290	280	1170	60	780	150	190	190	230	520
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	5.5		3.0	5.5		5.0	5.0		5.0	5.0	5.0
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	0.95		0.95	0.95	1.00
Frt	1.00	0.88		1.00	0.99		1.00	0.92		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	4470		1770	5048		1770	3243		1681	1763	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	4470		1770	5048		1770	3243		1681	1763	1583
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)	200	326	1358	295	1232	63	821	158	200	200	242	547
RTOR Reduction (vph)	0	519	0	0	4	0	0	135	0	0	0	99
Lane Group Flow (vph)	200	1165	0	295	1291	0	821	223	0	180	262	448
Turn Type	Prot	NA		Prot	NA		Split	NA		Split	NA	Perm
Protected Phases	1	6		5	2		4	4		8	8	
Permitted Phases												8
Actuated Green, G (s)	9.0	30.5		12.0	33.5		47.0	47.0		37.0	37.0	37.0
Effective Green, g (s)	9.0	30.5		12.0	33.5		47.0	47.0		37.0	37.0	37.0
Actuated g/C Ratio	0.06	0.21		0.08	0.23		0.32	0.32		0.26	0.26	0.26
Clearance Time (s)	3.0	5.5		3.0	5.5		5.0	5.0		5.0	5.0	5.0
Vehicle Extension (s)	1.5	4.5		1.5	4.5		2.5	2.5		2.5	2.5	2.5
Lane Grp Cap (vph)	109	940		146	1166		573	1051		428	449	403
v/s Ratio Prot	0.11	c0.26		c0.17	c0.26		c0.46	0.07		0.11	0.15	
v/s Ratio Perm												c0.28
v/c Ratio	1.83	1.60dr		2.02	1.11		1.43	0.21		0.42	0.58	1.11
Uniform Delay, d1	68.0	57.3		66.5	55.8		49.0	35.6		45.1	47.3	54.0
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	409.0	116.9		482.5	60.9		204.7	0.1		0.5	1.6	78.6
Delay (s)	477.0	174.2		549.0	116.7		253.7	35.6		45.5	48.9	132.6
Level of Service	F	F		F	F		F	D		D	D	F
Approach Delay (s)		206.3			196.9			187.5			94.6	
Approach LOS		F			F			F			F	

Intersection Summary			
HCM 2000 Control Delay	180.1	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.31		
Actuated Cycle Length (s)	145.0	Sum of lost time (s)	18.5
Intersection Capacity Utilization	122.2%	ICU Level of Service	H
Analysis Period (min)	15		

dr Defacto Right Lane. Recode with 1 though lane as a right lane.

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	530	300	410	90	1330	400	220	210	30	280	480	750
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	6.0		3.0	6.0		3.0	6.0		3.0	6.0	6.0
Lane Util. Factor	0.97	0.95		1.00	0.91		0.97	0.95		1.00	0.95	1.00
Frt	1.00	0.91		1.00	0.97		1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3433	3233		1770	4909		3433	3472		1770	3539	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3433	3233		1770	4909		3433	3472		1770	3539	1583
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)	558	316	432	95	1400	421	232	221	32	295	505	789
RTOR Reduction (vph)	0	168	0	0	39	0	0	7	0	0	0	172
Lane Group Flow (vph)	558	580	0	95	1782	0	232	246	0	295	505	617
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	Perm
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases												4
Actuated Green, G (s)	20.0	58.9		11.1	50.0		7.0	24.7		27.3	45.0	45.0
Effective Green, g (s)	20.0	58.9		11.1	50.0		7.0	24.7		27.3	45.0	45.0
Actuated g/C Ratio	0.14	0.42		0.08	0.36		0.05	0.18		0.20	0.32	0.32
Clearance Time (s)	3.0	6.0		3.0	6.0		3.0	6.0		3.0	6.0	6.0
Vehicle Extension (s)	1.5	4.0		1.5	4.0		1.5	4.0		1.5	4.0	4.0
Lane Grp Cap (vph)	490	1360		140	1753		171	612		345	1137	508
v/s Ratio Prot	c0.16	0.18		0.05	c0.36		c0.07	0.07		0.17	0.14	
v/s Ratio Perm												c0.39
v/c Ratio	1.14	0.43		0.68	1.02		1.36	0.40		0.86	0.44	1.21
Uniform Delay, d1	60.0	28.6		62.7	45.0		66.5	51.1		54.4	37.6	47.5
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	84.7	0.3		9.8	25.8		193.7	0.6		17.7	0.4	113.3
Delay (s)	144.7	28.9		72.5	70.8		260.2	51.7		72.1	38.0	160.8
Level of Service	F	C		E	E		F	D		E	D	F
Approach Delay (s)		78.4			70.9			151.4			105.3	
Approach LOS		E			E			F			F	

Intersection Summary			
HCM 2000 Control Delay	90.4	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.13		
Actuated Cycle Length (s)	140.0	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	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	780	360	800	710	310	730
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	0.97	0.88	0.95		1.00	0.95
Frt	1.00	0.85	0.93		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	3433	2787	3290		1770	3539
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	3433	2787	3290		1770	3539
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	821	379	842	747	326	768
RTOR Reduction (vph)	0	235	101	0	0	0
Lane Group Flow (vph)	821	144	1488	0	326	768
Turn Type	NA	Prot	NA		Prot	NA
Protected Phases	8	8	2		1	6
Permitted Phases						
Actuated Green, G (s)	31.2	31.2	55.3		21.2	80.5
Effective Green, g (s)	31.2	31.2	55.3		21.2	80.5
Actuated g/C Ratio	0.24	0.24	0.43		0.17	0.63
Clearance Time (s)	4.0	4.0	4.0		4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	840	681	1426		294	2234
v/s Ratio Prot	c0.24	0.05	c0.45		c0.18	0.22
v/s Ratio Perm						
v/c Ratio	0.98	0.21	1.04		1.11	0.34
Uniform Delay, d1	47.8	38.4	36.1		53.2	11.1
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	25.3	0.2	36.1		84.9	0.4
Delay (s)	73.1	38.5	72.2		138.1	11.5
Level of Service	E	D	E		F	B
Approach Delay (s)	62.2		72.2			49.2
Approach LOS	E		E			D

Intersection Summary			
HCM 2000 Control Delay	62.6	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.00		
Actuated Cycle Length (s)	127.5	Sum of lost time (s)	16.0
Intersection Capacity Utilization	94.3%	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)	160	390	240	140	430	130	130	950	40	90	700	130
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		3.0	5.5		3.0	5.5	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.94		1.00	0.97		1.00	0.99		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1756		1770	1798		1770	3518		1770	3456	
Flt Permitted	0.18	1.00		0.18	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	339	1756		339	1798		1770	3518		1770	3456	
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)	168	411	253	147	453	137	137	1000	42	95	737	137
RTOR Reduction (vph)	0	37	0	0	18	0	0	5	0	0	26	0
Lane Group Flow (vph)	168	627	0	147	572	0	137	1037	0	95	848	0
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		6			2		7	4		3	8	
Permitted Phases	6			2								
Actuated Green, G (s)	22.0	22.0		22.0	22.0		5.0	21.5		4.0	20.5	
Effective Green, g (s)	22.0	22.0		22.0	22.0		5.0	21.5		4.0	20.5	
Actuated g/C Ratio	0.37	0.37		0.37	0.37		0.08	0.36		0.07	0.34	
Clearance Time (s)	4.0	4.0		4.0	4.0		3.0	5.5		3.0	5.5	
Vehicle Extension (s)	2.5	2.5		2.5	2.5		1.0	4.5		1.0	4.5	
Lane Grp Cap (vph)	124	643		124	659		147	1260		118	1180	
v/s Ratio Prot		0.36			0.32		c0.08	c0.29		0.05	0.25	
v/s Ratio Perm	c0.50			0.43								
v/c Ratio	1.35	0.98		1.19	0.87		0.93	0.82		0.81	0.72	
Uniform Delay, d1	19.0	18.7		19.0	17.6		27.3	17.5		27.6	17.2	
Progression Factor	1.00	1.00		0.85	0.84		1.00	1.00		1.00	1.00	
Incremental Delay, d2	203.2	29.1		137.4	11.1		53.4	6.2		30.0	3.8	
Delay (s)	222.2	47.9		153.5	25.9		80.7	23.7		57.7	21.0	
Level of Service	F	D		F	C		F	C		E	C	
Approach Delay (s)		83.1			51.4			30.3			24.6	
Approach LOS		F			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	44.8	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.09		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	12.5
Intersection Capacity Utilization	90.0%	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)	150	200	110	90	320	40	110	1010	90	30	820	90
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	3.5	4.5	4.5	3.5	4.5	4.5
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	1770	3539	1583	1770	3539	1583
Flt Permitted	0.45	1.00	1.00	0.60	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	839	1863	1583	1121	1863	1583	1770	3539	1583	1770	3539	1583
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)	158	211	116	95	337	42	116	1063	95	32	863	95
RTOR Reduction (vph)	0	0	71	0	0	26	0	0	59	0	0	62
Lane Group Flow (vph)	158	211	45	95	337	16	116	1063	36	32	863	33
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases		2			6		7	4		3	8	
Permitted Phases	2		2	6		6			4			8
Actuated Green, G (s)	23.2	23.2	23.2	23.2	23.2	23.2	4.5	23.0	23.0	1.8	20.3	20.3
Effective Green, g (s)	23.2	23.2	23.2	23.2	23.2	23.2	4.5	23.0	23.0	1.8	20.3	20.3
Actuated g/C Ratio	0.39	0.39	0.39	0.39	0.39	0.39	0.08	0.38	0.38	0.03	0.34	0.34
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	3.5	4.5	4.5	3.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	2.0	2.5	2.5	2.0	2.5	2.5
Lane Grp Cap (vph)	324	720	612	433	720	612	132	1356	606	53	1197	535
v/s Ratio Prot		0.11			0.18		c0.07	c0.30		0.02	0.24	
v/s Ratio Perm	c0.19		0.03	0.08		0.01			0.02			0.02
v/c Ratio	0.49	0.29	0.07	0.22	0.47	0.03	0.88	0.78	0.06	0.60	0.72	0.06
Uniform Delay, d1	13.9	12.7	11.6	12.3	13.8	11.4	27.5	16.3	11.7	28.7	17.4	13.4
Progression Factor	1.07	1.14	1.81	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.1	0.4	0.1	0.3	0.5	0.0	42.5	2.9	0.0	12.6	2.0	0.0
Delay (s)	17.0	14.9	21.1	12.6	14.3	11.4	70.0	19.2	11.7	41.3	19.4	13.5
Level of Service	B	B	C	B	B	B	E	B	B	D	B	B
Approach Delay (s)		17.1			13.7			23.3			19.5	
Approach LOS		B			B			C			B	

Intersection Summary			
HCM 2000 Control Delay	19.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	70.2%	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)	160	820	420	240	900	40	480	260	210	100	170	80
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.7	5.3	5.3	3.7	4.9		3.7	5.3		3.7	4.9	4.9
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		1.00	0.95		1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	0.99		1.00	0.93		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)	1770	3539	1583	1770	3517		1770	3302		1770	3539	1583
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)	1770	3539	1583	1770	3517		1770	3302		1770	3539	1583
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)	168	863	442	253	947	42	505	274	221	105	179	84
RTOR Reduction (vph)	0	0	153	0	2	0	0	129	0	0	0	76
Lane Group Flow (vph)	168	863	289	253	987	0	505	366	0	105	179	8
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)	18.8	46.8	46.8	26.9	55.3		43.9	21.7		36.6	14.8	14.8
Effective Green, g (s)	18.8	46.8	46.8	26.9	55.3		43.9	21.7		36.6	14.8	14.8
Actuated g/C Ratio	0.13	0.31	0.31	0.18	0.37		0.29	0.14		0.24	0.10	0.10
Clearance Time (s)	3.7	5.3	5.3	3.7	4.9		3.7	5.3		3.7	4.9	4.9
Vehicle Extension (s)	3.0	2.5	2.5	3.0	3.0		3.0	2.5		3.0	3.0	3.0
Lane Grp Cap (vph)	221	1104	493	317	1296		518	477		431	349	156
v/s Ratio Prot	0.09	0.24		c0.14	c0.28		c0.29	0.11		0.06	c0.05	
v/s Ratio Perm			0.18									0.01
v/c Ratio	0.76	0.78	0.59	0.80	0.76		0.97	0.77		0.24	0.51	0.05
Uniform Delay, d1	63.4	47.0	43.4	58.9	41.6		52.5	61.7		45.6	64.2	61.3
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	14.2	5.5	5.0	13.1	4.3		32.9	6.9		0.3	1.3	0.1
Delay (s)	77.7	52.5	48.5	72.0	45.8		85.4	68.7		45.9	65.5	61.4
Level of Service	E	D	D	E	D		F	E		D	E	E
Approach Delay (s)		54.1			51.2			77.1			58.9	
Approach LOS		D			D			E			E	

Intersection Summary			
HCM 2000 Control Delay	59.3	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	82.4%	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)	130	1390	280	160	820	330	310	890	280	310	880	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	5.0		3.5	5.0		3.5	5.0		3.5	5.0	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	0.95		1.00	0.95	
Frt	1.00	0.97		1.00	0.96		1.00	0.96		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	4957		1770	4867		1770	3412		1770	3510	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	4957		1770	4867		1770	3412		1770	3510	
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)	137	1463	295	168	863	347	326	937	295	326	926	53
RTOR Reduction (vph)	0	38	0	0	75	0	0	38	0	0	5	0
Lane Group Flow (vph)	137	1720	0	168	1135	0	326	1194	0	326	974	0
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	3.0	30.0		3.0	30.0		3.0	27.0		3.0	27.0	
Effective Green, g (s)	3.0	30.0		3.0	30.0		3.0	27.0		3.0	27.0	
Actuated g/C Ratio	0.04	0.38		0.04	0.38		0.04	0.34		0.04	0.34	
Clearance Time (s)	3.5	5.0		3.5	5.0		3.5	5.0		3.5	5.0	
Vehicle Extension (s)	2.0	3.0		2.0	3.0		2.0	3.0		2.0	3.0	
Lane Grp Cap (vph)	66	1858		66	1825		66	1151		66	1184	
v/s Ratio Prot	0.08	c0.35		c0.09	0.23		c0.18	c0.35		0.18	0.28	
v/s Ratio Perm												
v/c Ratio	2.08	0.93		2.55	0.62		4.94	1.04		4.94	0.82	
Uniform Delay, d1	38.5	23.9		38.5	20.4		38.5	26.5		38.5	24.3	
Progression Factor	1.00	1.00		1.00	1.00		1.13	1.05		0.95	0.86	
Incremental Delay, d2	532.0	8.4		737.8	0.7		1805.8	36.6		1805.8	6.4	
Delay (s)	570.5	32.3		776.3	21.0		1849.3	64.3		1842.4	27.4	
Level of Service	F	C		F	C		F	E		F	C	
Approach Delay (s)		71.2			113.1			437.8			480.8	
Approach LOS		E			F			F			F	

Intersection Summary			
HCM 2000 Control Delay	260.8	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.24		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	17.0
Intersection Capacity Utilization	107.7%	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)	520	1200	200	220	910	140	390	1120	160	160	980	290
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	5.0		3.5	5.0	5.0	3.5	5.0		3.5	5.0	5.0
Lane Util. Factor	1.00	0.91		1.00	0.95	1.00	1.00	0.95		1.00	0.95	1.00
Frt	1.00	0.98		1.00	1.00	0.85	1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	4976		1770	3539	1583	1770	3473		1770	3539	1583
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	4976		1770	3539	1583	1770	3473		1770	3539	1583
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)	547	1263	211	232	958	147	411	1179	168	168	1032	305
RTOR Reduction (vph)	0	25	0	0	0	111	0	12	0	0	0	121
Lane Group Flow (vph)	547	1449	0	232	958	36	411	1335	0	168	1032	184
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA		Prot	NA	Perm
Protected Phases	7	4		3	8		1	6		5	2	
Permitted Phases						8						2
Actuated Green, G (s)	14.5	24.5		12.0	22.0	22.0	11.5	31.0		5.5	25.0	25.0
Effective Green, g (s)	14.5	24.5		12.0	22.0	22.0	11.5	31.0		5.5	25.0	25.0
Actuated g/C Ratio	0.16	0.27		0.13	0.24	0.24	0.13	0.34		0.06	0.28	0.28
Clearance Time (s)	3.5	5.0		3.5	5.0	5.0	3.5	5.0		3.5	5.0	5.0
Vehicle Extension (s)	2.0	2.5		2.0	2.5	2.5	2.0	2.5		2.0	2.5	2.5
Lane Grp Cap (vph)	285	1354		236	865	386	226	1196		108	983	439
v/s Ratio Prot	c0.31	c0.29		0.13	0.27		c0.23	c0.38		0.09	0.29	
v/s Ratio Perm						0.02						0.12
v/c Ratio	1.92	1.07		0.98	1.11	0.09	1.82	1.12		1.56	1.05	0.42
Uniform Delay, d1	37.8	32.8		38.9	34.0	26.3	39.2	29.5		42.2	32.5	26.6
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	426.5	45.5		53.3	64.5	0.1	385.3	63.9		290.2	42.7	2.9
Delay (s)	464.2	78.2		92.2	98.5	26.4	424.5	93.4		332.5	75.2	29.5
Level of Service	F	E		F	F	C	F	F		F	E	C
Approach Delay (s)		182.7			89.5			170.8			94.6	
Approach LOS		F			F			F			F	

Intersection Summary			
HCM 2000 Control Delay	140.7	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.41		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	17.0
Intersection Capacity Utilization	117.7%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	EBR2	WBL2	WBL	WBT	WBR	NBL2	NBL	NBT	NBR
Lane Configurations												
Volume (vph)	10	500	130	30	20	100	360	30	230	370	910	120
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0				4.0	4.0			4.0	4.0	
Lane Util. Factor		0.95				1.00	1.00			1.00	0.95	
Frt		0.96				1.00	0.99			1.00	0.98	
Flt Protected		1.00				0.95	1.00			0.95	1.00	
Satd. Flow (prot)		3409				1770	1841			1770	3478	
Flt Permitted		1.00				0.95	1.00			0.95	1.00	
Satd. Flow (perm)		3409				1770	1841			1770	3478	
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)	11	526	137	32	21	105	379	32	242	389	958	126
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	10	0
Lane Group Flow (vph)	0	706	0	0	0	126	411	0	0	631	1074	0
Turn Type	Split	NA			Split	Split	NA		Prot	Prot	NA	
Protected Phases	4	4			8	8	8		5	5	2	
Permitted Phases												
Actuated Green, G (s)		17.0				19.0	19.0			21.0	35.0	
Effective Green, g (s)		17.0				19.0	19.0			21.0	35.0	
Actuated g/C Ratio		0.17				0.19	0.19			0.21	0.35	
Clearance Time (s)		4.0				4.0	4.0			4.0	4.0	
Vehicle Extension (s)		3.0				3.0	3.0			3.0	3.0	
Lane Grp Cap (vph)		579				336	349			371	1217	
v/s Ratio Prot		c0.21				0.07	c0.22			c0.36	0.31	
v/s Ratio Perm												
v/c Ratio		1.22				0.38	1.18			1.70	0.88	
Uniform Delay, d1		41.5				35.3	40.5			39.5	30.6	
Progression Factor		1.00				1.00	1.00			1.00	1.00	
Incremental Delay, d2		113.7				0.7	105.8			326.7	9.4	
Delay (s)		155.2				36.0	146.3			366.2	40.0	
Level of Service		F				D	F			F	D	
Approach Delay (s)		155.2					120.4				160.0	
Approach LOS		F					F				F	

Intersection Summary			
HCM 2000 Control Delay	152.0	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.34		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	118.3%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBL	SBT	SBR	SBR2
Lane Configurations				
Volume (vph)	210	650	410	20
Ideal Flow (vphpl)	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		
Lane Util. Factor	1.00	0.95		
Frt	1.00	0.94		
Flt Protected	0.95	1.00		
Satd. Flow (prot)	1770	3328		
Flt Permitted	0.95	1.00		
Satd. Flow (perm)	1770	3328		
Peak-hour factor, PHF	0.95	0.95	0.95	0.95
Adj. Flow (vph)	221	684	432	21
RTOR Reduction (vph)	0	1	0	0
Lane Group Flow (vph)	221	1136	0	0
Turn Type	Prot	NA		
Protected Phases	1	6		
Permitted Phases				
Actuated Green, G (s)	13.0	27.0		
Effective Green, g (s)	13.0	27.0		
Actuated g/C Ratio	0.13	0.27		
Clearance Time (s)	4.0	4.0		
Vehicle Extension (s)	3.0	3.0		
Lane Grp Cap (vph)	230	898		
v/s Ratio Prot	0.12	c0.34		
v/s Ratio Perm				
v/c Ratio	0.96	1.26		
Uniform Delay, d1	43.2	36.5		
Progression Factor	1.00	1.00		
Incremental Delay, d2	48.2	127.9		
Delay (s)	91.4	164.4		
Level of Service	F	F		
Approach Delay (s)		152.6		
Approach LOS		F		

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	230	370	140	100	310	120	150	1160	80	230	1350	250
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5	5.5	5.5	5.5	5.5	4.0	5.5		4.0	5.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95		1.00	0.95	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99		1.00	0.98	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	1770	3505		1770	3456	
Flt Permitted	0.39	1.00	1.00	0.29	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	718	1863	1583	541	1863	1583	1770	3505		1770	3456	
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)	242	389	147	105	326	126	158	1221	84	242	1421	263
RTOR Reduction (vph)	0	0	102	0	0	62	0	7	0	0	19	0
Lane Group Flow (vph)	242	389	45	105	326	64	158	1298	0	242	1665	0
Turn Type	Perm	NA	Perm	Perm	NA	custom	Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8		6						
Actuated Green, G (s)	22.7	22.7	22.7	22.7	22.7	37.3	5.0	32.3		10.0	37.3	
Effective Green, g (s)	22.7	22.7	22.7	22.7	22.7	37.3	5.0	32.3		10.0	37.3	
Actuated g/C Ratio	0.28	0.28	0.28	0.28	0.28	0.47	0.06	0.40		0.12	0.47	
Clearance Time (s)	5.5	5.5	5.5	5.5	5.5	5.5	4.0	5.5		4.0	5.5	
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0	3.0	2.0		3.0	2.0	
Lane Grp Cap (vph)	203	528	449	153	528	738	110	1415		221	1611	
v/s Ratio Prot		0.21			0.18		c0.09	0.37		c0.14	c0.48	
v/s Ratio Perm	c0.34		0.03	0.19		0.04						
v/c Ratio	1.19	0.74	0.10	0.69	0.62	0.09	1.44	0.92		1.10	1.03	
Uniform Delay, d1	28.6	25.9	21.1	25.5	24.9	11.9	37.5	22.6		35.0	21.4	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.30		1.00	1.00	
Incremental Delay, d2	124.6	4.6	0.0	9.7	1.5	0.2	230.4	8.5		88.2	31.5	
Delay (s)	153.3	30.5	21.2	35.2	26.4	12.1	266.2	37.9		123.2	52.9	
Level of Service	F	C	C	D	C	B	F	D		F	D	
Approach Delay (s)		66.9			24.8			62.5			61.7	
Approach LOS		E			C			E			E	

Intersection Summary			
HCM 2000 Control Delay	58.5	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.14		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	99.7%	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)	440	1610	190	0	1040	130	100	890	130	240	0	860
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.7	4.9			4.9	4.9	4.9	4.9		4.9		4.9
Lane Util. Factor	0.97	0.95			0.95	1.00	1.00	0.95		1.00		0.88
Frt	1.00	0.98			1.00	0.85	1.00	0.98		1.00		0.85
Flt Protected	0.95	1.00			1.00	1.00	0.95	1.00		0.95		1.00
Satd. Flow (prot)	3433	3483			3539	1583	1770	3471		1770		2787
Flt Permitted	0.95	1.00			1.00	1.00	0.95	1.00		0.13		1.00
Satd. Flow (perm)	3433	3483			3539	1583	1770	3471		248		2787
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)	463	1695	200	0	1095	137	105	937	137	253	0	905
RTOR Reduction (vph)	0	9	0	0	0	34	0	11	0	0	0	468
Lane Group Flow (vph)	463	1886	0	0	1095	103	105	1063	0	253	0	437
Turn Type	Prot	NA			NA	Perm	Perm	NA		D.Pm		custom
Protected Phases	5	2			6			4				
Permitted Phases						6	4			4		4
Actuated Green, G (s)	17.9	65.2			43.6	43.6	30.0	30.0		30.0		30.0
Effective Green, g (s)	17.9	65.2			43.6	43.6	30.0	30.0		30.0		30.0
Actuated g/C Ratio	0.17	0.62			0.42	0.42	0.29	0.29		0.29		0.29
Clearance Time (s)	3.7	4.9			4.9	4.9	4.9	4.9		4.9		4.9
Vehicle Extension (s)	2.5	5.0			5.0	5.0	4.0	4.0		4.0		4.0
Lane Grp Cap (vph)	585	2162			1469	657	505	991		70		796
v/s Ratio Prot	0.13	c0.54			0.31			0.31				
v/s Ratio Perm						0.07	0.06			c1.02		0.16
v/c Ratio	0.79	0.87			0.75	0.16	0.21	1.07		3.61		0.55
Uniform Delay, d1	41.8	16.5			26.0	19.2	28.5	37.5		37.5		31.8
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00		1.00		1.00
Incremental Delay, d2	7.0	5.2			3.5	0.5	0.3	50.3		1211.0		1.0
Delay (s)	48.8	21.7			29.5	19.7	28.8	87.8		1248.5		32.7
Level of Service	D	C			C	B	C	F		F		C
Approach Delay (s)		27.0			28.4			82.5			298.4	
Approach LOS		C			C			F			F	

Intersection Summary			
HCM 2000 Control Delay	91.3	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.79		
Actuated Cycle Length (s)	105.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	104.1%	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)	150	740	240	170	630	210	150	930	140	270	810	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.0		3.0	4.5		3.0	4.5		3.0	4.5	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.96		1.00	0.96		1.00	0.98		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3409		1770	3406		1770	3470		1770	3503	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3409		1770	3406		1770	3470		1770	3503	
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)	158	779	253	179	663	221	158	979	147	284	853	63
RTOR Reduction (vph)	0	32	0	0	33	0	0	12	0	0	5	0
Lane Group Flow (vph)	158	1000	0	179	851	0	158	1114	0	284	911	0
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	9.9	28.0		10.0	27.6		11.0	32.5		15.0	36.5	
Effective Green, g (s)	9.9	28.0		10.0	27.6		11.0	32.5		15.0	36.5	
Actuated g/C Ratio	0.10	0.28		0.10	0.28		0.11	0.32		0.15	0.36	
Clearance Time (s)	3.0	4.0		3.0	4.5		3.0	4.5		3.0	4.5	
Vehicle Extension (s)	1.5	4.5		1.5	4.5		1.5	4.5		1.5	4.5	
Lane Grp Cap (vph)	175	954		177	940		194	1127		265	1278	
v/s Ratio Prot	0.09	c0.29		c0.10	0.25		0.09	c0.32		c0.16	0.26	
v/s Ratio Perm												
v/c Ratio	0.90	1.05		1.01	0.91		0.81	0.99		1.07	0.71	
Uniform Delay, d1	44.6	36.0		45.0	34.9		43.5	33.6		42.5	27.3	
Progression Factor	1.00	1.00		0.80	0.65		0.73	1.20		1.00	1.00	
Incremental Delay, d2	40.6	42.7		42.1	4.9		13.3	17.7		75.6	3.4	
Delay (s)	85.2	78.7		78.1	27.7		45.1	57.9		118.1	30.7	
Level of Service	F	E		E	C		D	E		F	C	
Approach Delay (s)		79.6			36.2			56.3			51.4	
Approach LOS		E			D			E			D	

Intersection Summary			
HCM 2000 Control Delay	56.4	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.03		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	96.4%	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)	150	930	100	80	920	190	110	1020	90	140	980	90
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.5		3.0	4.5		3.0	5.0		3.0	5.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.99		1.00	0.97		1.00	0.99		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3488		1770	3448		1770	3496		1770	3494	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3488		1770	3448		1770	3496		1770	3494	
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)	158	979	105	84	968	200	116	1074	95	147	1032	95
RTOR Reduction (vph)	0	8	0	0	17	0	0	7	0	0	7	0
Lane Group Flow (vph)	158	1076	0	84	1151	0	116	1162	0	147	1120	0
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases												
Actuated Green, G (s)	9.0	38.5		6.0	35.5		7.0	31.0		9.0	33.0	
Effective Green, g (s)	9.0	38.5		6.0	35.5		7.0	31.0		9.0	33.0	
Actuated g/C Ratio	0.09	0.38		0.06	0.36		0.07	0.31		0.09	0.33	
Clearance Time (s)	3.0	4.5		3.0	4.5		3.0	5.0		3.0	5.0	
Vehicle Extension (s)	1.5	2.5		1.5	2.5		1.5	2.5		1.5	2.5	
Lane Grp Cap (vph)	159	1342		106	1224		123	1083		159	1153	
v/s Ratio Prot	c0.09	c0.31		0.05	c0.33		0.07	c0.33		c0.08	0.32	
v/s Ratio Perm												
v/c Ratio	0.99	0.80		0.79	0.94		0.94	1.07		0.92	0.97	
Uniform Delay, d1	45.5	27.4		46.4	31.2		46.3	34.5		45.2	33.0	
Progression Factor	0.81	1.68		0.79	1.02		1.17	0.68		1.00	1.00	
Incremental Delay, d2	19.8	0.5		25.0	12.4		59.7	48.2		48.7	19.9	
Delay (s)	56.6	46.4		61.7	44.3		114.0	71.7		93.9	52.9	
Level of Service	E	D		E	D		F	E		F	D	
Approach Delay (s)		47.7			45.5			75.6			57.7	
Approach LOS		D			D			E			E	

Intersection Summary			
HCM 2000 Control Delay	56.8	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.95		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	15.5
Intersection Capacity Utilization	93.2%	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)	10	1000	300	270	830	10	330	10	350	10	10	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5		3.5	5.5			4.0	4.0		4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00		1.00	
Frt	1.00	0.97		1.00	1.00			1.00	0.85		0.96	
Flt Protected	0.95	1.00		0.95	1.00			0.95	1.00		0.98	
Satd. Flow (prot)	1770	3417		1770	3533			1777	1583		1750	
Flt Permitted	0.32	1.00		0.95	1.00			0.71	1.00		0.64	
Satd. Flow (perm)	598	3417		1770	3533			1320	1583		1146	
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)	11	1053	316	284	874	11	347	11	368	11	11	11
RTOR Reduction (vph)	0	28	0	0	1	0	0	0	184	0	9	0
Lane Group Flow (vph)	11	1341	0	284	884	0	0	358	184	0	24	0
Turn Type	Perm	NA		Prot	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		6		5	2			4			8	
Permitted Phases	6						4		4	8		
Actuated Green, G (s)	57.5	57.5		9.0	70.0			20.5	20.5		20.5	
Effective Green, g (s)	57.5	57.5		9.0	70.0			20.5	20.5		20.5	
Actuated g/C Ratio	0.57	0.57		0.09	0.70			0.20	0.20		0.20	
Clearance Time (s)	5.5	5.5		3.5	5.5			4.0	4.0		4.0	
Vehicle Extension (s)	4.5	4.5		3.0	4.5			3.0	3.0		3.0	
Lane Grp Cap (vph)	343	1964		159	2473			270	324		234	
v/s Ratio Prot		c0.39		c0.16	0.25							
v/s Ratio Perm	0.02							c0.27	0.12		0.02	
v/c Ratio	0.03	0.68		1.79	0.36			1.33	0.57		0.10	
Uniform Delay, d1	9.2	14.9		45.5	6.0			39.8	35.8		32.3	
Progression Factor	0.29	0.18		1.00	1.00			1.42	2.28		1.00	
Incremental Delay, d2	0.1	1.3		377.9	0.4			165.5	1.8		0.2	
Delay (s)	2.8	4.0		423.4	6.4			222.0	83.3		32.5	
Level of Service	A	A		F	A			F	F		C	
Approach Delay (s)		4.0			107.7			151.7			32.5	
Approach LOS		A			F			F			C	

Intersection Summary			
HCM 2000 Control Delay	73.3	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.95		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	88.9%	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)	640	1140	110	30	1110	170	70	140	60	250	150	400
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	5.5		3.5	5.5			5.0		5.0	5.0	3.5
Lane Util. Factor	0.97	0.95		1.00	0.95			0.95		1.00	1.00	1.00
Frt	1.00	0.99		1.00	0.98			0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.99		0.95	1.00	1.00
Satd. Flow (prot)	3433	3492		1770	3469			3377		1770	1863	1583
Flt Permitted	0.95	1.00		0.95	1.00			0.83		0.57	1.00	1.00
Satd. Flow (perm)	3433	3492		1770	3469			2841		1064	1863	1583
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)	674	1200	116	32	1168	179	74	147	63	263	158	421
RTOR Reduction (vph)	0	8	0	0	15	0	0	34	0	0	0	18
Lane Group Flow (vph)	674	1308	0	32	1332	0	0	250	0	263	158	403
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA	pt+ov
Protected Phases	1	6		5	2			8			4	1 4
Permitted Phases							8			4		
Actuated Green, G (s)	14.4	41.2		2.7	29.5			22.1		22.1	22.1	41.5
Effective Green, g (s)	14.4	41.2		2.7	29.5			22.1		22.1	22.1	36.5
Actuated g/C Ratio	0.18	0.52		0.03	0.37			0.28		0.28	0.28	0.46
Clearance Time (s)	3.5	5.5		3.5	5.5			5.0		5.0	5.0	
Vehicle Extension (s)	2.5	4.5		1.5	4.5			2.5		3.0	3.0	
Lane Grp Cap (vph)	617	1798		59	1279			784		293	514	722
v/s Ratio Prot	c0.20	0.37		0.02	c0.38						0.08	0.25
v/s Ratio Perm								0.09		c0.25		
v/c Ratio	1.09	0.73		0.54	1.04			0.32		0.90	0.31	0.56
Uniform Delay, d1	32.8	15.0		38.0	25.2			23.0		27.9	22.9	15.9
Progression Factor	1.00	1.00		1.00	1.00			1.00		0.52	0.50	0.39
Incremental Delay, d2	64.0	2.6		5.4	36.6			0.2		11.9	0.1	0.3
Delay (s)	96.8	17.7		43.4	61.9			23.1		26.5	11.5	6.4
Level of Service	F	B		D	E			C		C	B	A
Approach Delay (s)		44.5			61.4			23.1			13.7	
Approach LOS		D			E			C			B	

Intersection Summary			
HCM 2000 Control Delay	42.5	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.00		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	92.3%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	500	580	750	370	140	940
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	526	611	789	389	147	989
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						637
pX, platoon unblocked						
vC, conflicting volume	2268	984			1179	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2268	984			1179	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	0	0			75	
cM capacity (veh/h)	33	301			592	

Direction, Lane #	WB 1	WB 2	NB 1	SB 1	SB 2
Volume Total	526	611	1179	147	989
Volume Left	526	0	0	147	0
Volume Right	0	611	389	0	0
cSH	33	301	1700	592	1700
Volume to Capacity	15.72	2.03	0.69	0.25	0.58
Queue Length 95th (ft)	Err	1097	0	24	0
Control Delay (s)	Err	501.1	0.0	13.1	0.0
Lane LOS	F	F		B	
Approach Delay (s)	4898.3		0.0	1.7	
Approach LOS	F				

Intersection Summary			
Average Delay	1613.4		
Intersection Capacity Utilization	107.5%	ICU Level of Service	G
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	30	1120	80	30	520	20
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	32	1179	84	32	547	21
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)	469					
pX, platoon unblocked						
vC, conflicting volume			1211		216	32
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1211		216	32
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			85		15	98
cM capacity (veh/h)			572		642	1035

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1
Volume Total	32	1179	95	21	568
Volume Left	0	0	84	0	547
Volume Right	0	1179	0	0	21
cSH	1700	1700	572	1700	651
Volume to Capacity	0.02	0.69	0.15	0.01	0.87
Queue Length 95th (ft)	0	0	13	0	258
Control Delay (s)	0.0	0.0	11.2	0.0	36.6
Lane LOS			B		E
Approach Delay (s)	0.0		9.2		36.6
Approach LOS					E

Intersection Summary			
Average Delay	11.5		
Intersection Capacity Utilization	80.4%	ICU Level of Service	D
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	70	740	50	60	660	90	60	650	30	80	820	90
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0		4.0	5.0		4.0	5.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.99		1.00	0.98		1.00	0.99		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3505		1770	3475		1770	3515		1770	3487	
Flt Permitted	0.19	1.00		0.17	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	359	3505		318	3475		1770	3515		1770	3487	
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)	74	779	53	63	695	95	63	684	32	84	863	95
RTOR Reduction (vph)	0	6	0	0	13	0	0	3	0	0	7	0
Lane Group Flow (vph)	74	826	0	63	777	0	63	713	0	84	951	0
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)	33.2	33.2		33.2	33.2		6.4	43.4		9.4	46.4	
Effective Green, g (s)	33.2	33.2		33.2	33.2		6.4	43.4		9.4	46.4	
Actuated g/C Ratio	0.33	0.33		0.33	0.33		0.06	0.43		0.09	0.46	
Clearance Time (s)	5.0	5.0		5.0	5.0		4.0	5.0		4.0	5.0	
Vehicle Extension (s)	3.5	3.5		3.5	3.5		2.0	4.0		2.0	4.0	
Lane Grp Cap (vph)	119	1163		105	1153		113	1525		166	1617	
v/s Ratio Prot		c0.24			0.22		0.04	0.20		c0.05	c0.27	
v/s Ratio Perm	0.21			0.20								
v/c Ratio	0.62	0.71		0.60	0.67		0.56	0.47		0.51	0.59	
Uniform Delay, d1	28.1	29.2		27.9	28.7		45.4	20.1		43.1	19.8	
Progression Factor	1.00	1.00		1.56	1.49		1.00	1.00		1.00	1.00	
Incremental Delay, d2	10.1	2.1		5.8	1.0		3.4	1.0		0.9	1.6	
Delay (s)	38.3	31.3		49.2	43.7		48.8	21.1		44.0	21.3	
Level of Service	D	C		D	D		D	C		D	C	
Approach Delay (s)		31.9			44.1			23.4			23.2	
Approach LOS		C			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	30.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	71.7%	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)	180	760	200	160	580	90	150	900	140	100	870	120
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	5.0		3.0	5.0		3.0	5.0		3.0	5.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.97		1.00	0.98		1.00	0.98		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3428		1770	3468		1770	3468		1770	3475	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3428		1770	3468		1770	3468		1770	3475	
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)	189	800	211	168	611	95	158	947	147	105	916	126
RTOR Reduction (vph)	0	23	0	0	13	0	0	13	0	0	11	0
Lane Group Flow (vph)	189	988	0	168	693	0	158	1081	0	105	1031	0
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												
Actuated Green, G (s)	11.6	27.1		10.5	26.0		9.9	37.0		9.4	36.5	
Effective Green, g (s)	11.6	27.1		10.5	26.0		9.9	37.0		9.4	36.5	
Actuated g/C Ratio	0.12	0.27		0.10	0.26		0.10	0.37		0.09	0.36	
Clearance Time (s)	3.0	5.0		3.0	5.0		3.0	5.0		3.0	5.0	
Vehicle Extension (s)	1.5	4.0		1.5	4.0		1.5	4.0		1.5	4.0	
Lane Grp Cap (vph)	205	928		185	901		175	1283		166	1268	
v/s Ratio Prot	c0.11	c0.29		0.09	0.20		c0.09	c0.31		0.06	c0.30	
v/s Ratio Perm												
v/c Ratio	0.92	1.06		0.91	0.77		0.90	0.84		0.63	0.81	
Uniform Delay, d1	43.8	36.4		44.3	34.2		44.6	28.8		43.6	28.7	
Progression Factor	0.67	0.94		1.00	1.00		1.00	1.00		1.16	1.17	
Incremental Delay, d2	39.1	47.2		40.1	6.3		40.6	5.4		3.1	2.4	
Delay (s)	68.4	81.6		84.3	40.5		85.2	34.3		53.8	35.9	
Level of Service	E	F		F	D		F	C		D	D	
Approach Delay (s)		79.5			48.9			40.7			37.6	
Approach LOS		E			D			D			D	

Intersection Summary			
HCM 2000 Control Delay	51.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	87.4%	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)	160	970	70	70	660	100	40	750	60	130	950	90
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.99		1.00	0.98		1.00	0.99		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3503		1770	3470		1770	3500		1770	3493	
Flt Permitted	0.26	1.00		0.15	1.00		0.13	1.00		0.23	1.00	
Satd. Flow (perm)	492	3503		275	3470		244	3500		423	3493	
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)	168	1021	74	74	695	105	42	789	63	137	1000	95
RTOR Reduction (vph)	0	5	0	0	11	0	0	7	0	0	8	0
Lane Group Flow (vph)	168	1090	0	74	789	0	42	845	0	137	1087	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	46.5	46.5		46.5	46.5		43.5	43.5		43.5	43.5	
Effective Green, g (s)	46.5	46.5		46.5	46.5		43.5	43.5		43.5	43.5	
Actuated g/C Ratio	0.46	0.46		0.46	0.46		0.44	0.44		0.44	0.44	
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		4.0	4.0		3.0	3.0	
Lane Grp Cap (vph)	228	1628		127	1613		106	1522		184	1519	
v/s Ratio Prot		0.31			0.23			0.24			0.31	
v/s Ratio Perm	c0.34			0.27			0.17			c0.32		
v/c Ratio	0.74	0.67		0.58	0.49		0.40	0.56		0.74	0.72	
Uniform Delay, d1	21.8	20.8		19.6	18.5		19.3	21.0		23.6	23.2	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		0.98	0.90	
Incremental Delay, d2	11.7	1.1		6.7	0.2		10.7	1.5		9.2	1.0	
Delay (s)	33.5	21.8		26.3	18.8		30.0	22.5		32.3	21.8	
Level of Service	C	C		C	B		C	C		C	C	
Approach Delay (s)		23.4			19.4			22.9			23.0	
Approach LOS		C			B			C			C	

Intersection Summary			
HCM 2000 Control Delay	22.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	87.3%	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)	50	820	100	90	580	210	110	400	220	60	460	80
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0		4.5	4.5		4.5	4.5	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.98		1.00	0.96		1.00	0.95		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3482		1770	3398		1770	3351		1770	3461	
Flt Permitted	0.32	1.00		0.27	1.00		0.20	1.00		0.20	1.00	
Satd. Flow (perm)	590	3482		499	3398		373	3351		373	3461	
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)	53	863	105	95	611	221	116	421	232	63	484	84
RTOR Reduction (vph)	0	9	0	0	19	0	0	74	0	0	14	0
Lane Group Flow (vph)	53	959	0	95	813	0	116	579	0	63	554	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Actuated Green, G (s)	70.5	70.5		70.5	70.5		20.0	20.0		20.0	20.0	
Effective Green, g (s)	70.5	70.5		70.5	70.5		20.0	20.0		20.0	20.0	
Actuated g/C Ratio	0.70	0.70		0.70	0.70		0.20	0.20		0.20	0.20	
Clearance Time (s)	5.0	5.0		5.0	5.0		4.5	4.5		4.5	4.5	
Vehicle Extension (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Grp Cap (vph)	415	2454		351	2395		74	670		74	692	
v/s Ratio Prot		c0.28			0.24			0.17			0.16	
v/s Ratio Perm	0.09			0.19			c0.31			0.17		
v/c Ratio	0.13	0.39		0.27	0.34		1.57	0.86		0.85	0.80	
Uniform Delay, d1	4.8	6.0		5.4	5.7		40.0	38.7		38.6	38.1	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		0.78	0.79	
Incremental Delay, d2	0.6	0.5		1.9	0.4		310.6	11.5		8.8	0.7	
Delay (s)	5.4	6.5		7.3	6.1		350.6	50.2		39.0	30.8	
Level of Service	A	A		A	A		F	D		D	C	
Approach Delay (s)		6.4			6.2			95.5			31.6	
Approach LOS		A			A			F			C	

Intersection Summary			
HCM 2000 Control Delay	31.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	9.5
Intersection Capacity Utilization	71.5%	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)	160	980	60	70	700	160	30	390	80	160	260	140
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5		5.5	5.5		4.5	4.5		4.5	4.5	4.5
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.99		1.00	0.97		1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3509		1770	3441		1770	1815		1770	1863	1583
Flt Permitted	0.25	1.00		0.18	1.00		0.53	1.00		0.26	1.00	1.00
Satd. Flow (perm)	472	3509		328	3441		995	1815		480	1863	1583
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)	168	1032	63	74	737	168	32	411	84	168	274	147
RTOR Reduction (vph)	0	8	0	0	36	0	0	13	0	0	0	91
Lane Group Flow (vph)	168	1087	0	74	869	0	32	482	0	168	274	56
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		2			2			4			4	
Permitted Phases	2			2			4			4		4
Actuated Green, G (s)	25.2	25.2		25.2	25.2		19.0	19.0		19.0	19.0	19.0
Effective Green, g (s)	25.2	25.2		25.2	25.2		19.0	19.0		19.0	19.0	19.0
Actuated g/C Ratio	0.46	0.46		0.46	0.46		0.35	0.35		0.35	0.35	0.35
Clearance Time (s)	5.5	5.5		5.5	5.5		4.5	4.5		4.5	4.5	4.5
Vehicle Extension (s)	4.0	4.0		4.0	4.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	219	1631		152	1599		348	636		168	653	554
v/s Ratio Prot		0.31			0.25			0.27			0.15	
v/s Ratio Perm	c0.36			0.23			0.03			c0.35		0.04
v/c Ratio	0.77	0.67		0.49	0.54		0.09	0.76		1.00	0.42	0.10
Uniform Delay, d1	12.1	11.2		10.0	10.4		11.8	15.6		17.6	13.4	11.9
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	15.6	1.1		3.3	0.5		0.1	5.2		69.4	0.4	0.1
Delay (s)	27.7	12.4		13.4	10.9		11.9	20.7		87.0	13.8	11.9
Level of Service	C	B		B	B		B	C		F	B	B
Approach Delay (s)		14.4			11.0			20.2			34.2	
Approach LOS		B			B			C			C	

Intersection Summary			
HCM 2000 Control Delay	17.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	54.2	Sum of lost time (s)	10.0
Intersection Capacity Utilization	88.2%	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)	420	1170	770	220	1510	380	700	240	410	240	470	180
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	5.5		3.0	5.5		5.0	5.0		5.0	5.0	5.0
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	0.95		0.95	0.95	1.00
Frt	1.00	0.94		1.00	0.97		1.00	0.91		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	4782		1770	4932		1770	3204		1681	1765	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	4782		1770	4932		1770	3204		1681	1765	1583
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)	442	1232	811	232	1589	400	737	253	432	253	495	189
RTOR Reduction (vph)	0	132	0	0	49	0	0	198	0	0	0	108
Lane Group Flow (vph)	442	1911	0	232	1940	0	737	487	0	228	520	82
Turn Type	Prot	NA		Prot	NA		Split	NA		Split	NA	Perm
Protected Phases	1	6		5	2		4	4		8	8	
Permitted Phases												8
Actuated Green, G (s)	10.0	31.0		10.0	31.0		15.5	15.5		15.0	15.0	15.0
Effective Green, g (s)	10.0	31.0		10.0	31.0		15.5	15.5		15.0	15.0	15.0
Actuated g/C Ratio	0.11	0.34		0.11	0.34		0.17	0.17		0.17	0.17	0.17
Clearance Time (s)	3.0	5.5		3.0	5.5		5.0	5.0		5.0	5.0	5.0
Vehicle Extension (s)	1.5	4.5		1.5	4.5		2.5	2.5		2.5	2.5	2.5
Lane Grp Cap (vph)	196	1647		196	1698		304	551		280	294	263
v/s Ratio Prot	c0.25	c0.40		0.13	0.39		c0.42	0.15		0.14	c0.29	
v/s Ratio Perm												0.05
v/c Ratio	2.26	1.20dr		1.18	1.14		2.42	0.88		0.81	1.77	0.31
Uniform Delay, d1	40.0	29.5		40.0	29.5		37.2	36.4		36.2	37.5	33.0
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	580.8	79.4		122.6	71.9		650.9	15.5		16.0	359.5	0.5
Delay (s)	620.8	108.9		162.6	101.4		688.1	51.8		52.2	397.0	33.4
Level of Service	F	F		F	F		F	D		D	F	C
Approach Delay (s)		199.9			107.7			381.6			239.8	
Approach LOS		F			F			F			F	

Intersection Summary			
HCM 2000 Control Delay	212.8	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.71		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	18.5
Intersection Capacity Utilization	140.7%	ICU Level of Service	H
Analysis Period (min)	15		

dr Defacto Right Lane. Recode with 1 though lane as a right lane.

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	680	1260	310	30	650	580	350	320	70	470	250	920
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	6.0		3.0	6.0		3.0	6.0		3.0	6.0	6.0
Lane Util. Factor	0.97	0.95		1.00	0.91		0.97	0.95		1.00	0.95	1.00
Frt	1.00	0.97		1.00	0.93		1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3433	3434		1770	4725		3433	3444		1770	3539	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3433	3434		1770	4725		3433	3444		1770	3539	1583
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)	716	1326	326	32	684	611	368	337	74	495	263	968
RTOR Reduction (vph)	0	19	0	0	145	0	0	17	0	0	0	326
Lane Group Flow (vph)	716	1633	0	32	1150	0	368	394	0	495	263	642
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	Perm
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases												4
Actuated Green, G (s)	24.9	52.1		2.9	30.1		12.8	18.8		17.0	23.0	23.0
Effective Green, g (s)	24.9	52.1		2.9	30.1		12.8	18.8		17.0	23.0	23.0
Actuated g/C Ratio	0.23	0.48		0.03	0.28		0.12	0.17		0.16	0.21	0.21
Clearance Time (s)	3.0	6.0		3.0	6.0		3.0	6.0		3.0	6.0	6.0
Vehicle Extension (s)	1.5	4.0		1.5	4.0		1.5	4.0		1.5	4.0	4.0
Lane Grp Cap (vph)	785	1644		47	1307		403	595		276	748	334
v/s Ratio Prot	c0.21	c0.48		0.02	0.24		0.11	0.11		c0.28	0.07	
v/s Ratio Perm												c0.41
v/c Ratio	0.91	0.99		0.68	1.07dr		0.91	0.66		1.79	0.35	1.92
Uniform Delay, d1	40.9	28.2		52.5	37.6		47.5	42.0		45.9	36.5	42.9
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	14.6	20.5		27.7	7.4		24.3	3.0		371.2	0.4	425.3
Delay (s)	55.5	48.6		80.2	45.0		71.7	45.1		417.1	36.9	468.2
Level of Service	E	D		F	D		E	D		F	D	F
Approach Delay (s)		50.7			45.9			57.7			387.8	
Approach LOS		D			D			E			F	

Intersection Summary			
HCM 2000 Control Delay	144.4	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.39		
Actuated Cycle Length (s)	108.8	Sum of lost time (s)	18.0
Intersection Capacity Utilization	105.9%	ICU Level of Service	G
Analysis Period (min)	15		

dr Defacto Right Lane. Recode with 1 though lane as a right lane.

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	480	400	880	540	540	700
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	0.97	0.88	0.95		1.00	0.95
Frt	1.00	0.85	0.94		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	3433	2787	3337		1770	3539
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	3433	2787	3337		1770	3539
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	505	421	926	568	568	737
RTOR Reduction (vph)	0	341	66	0	0	0
Lane Group Flow (vph)	505	80	1428	0	568	737
Turn Type	NA	Prot	NA		Prot	NA
Protected Phases	8	8	2		1	6
Permitted Phases						
Actuated Green, G (s)	20.9	20.9	38.6		30.5	73.1
Effective Green, g (s)	20.9	20.9	38.6		30.5	73.1
Actuated g/C Ratio	0.19	0.19	0.35		0.28	0.67
Clearance Time (s)	4.0	4.0	4.0		4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	655	531	1176		493	2362
v/s Ratio Prot	c0.15	0.03	c0.43		c0.32	0.21
v/s Ratio Perm						
v/c Ratio	0.77	0.15	1.21		1.15	0.31
Uniform Delay, d1	42.0	36.9	35.4		39.5	7.6
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	5.6	0.1	104.4		89.6	0.3
Delay (s)	47.6	37.0	139.9		129.1	8.0
Level of Service	D	D	F		F	A
Approach Delay (s)	42.8		139.9			60.7
Approach LOS	D		F			E

Intersection Summary			
HCM 2000 Control Delay	88.0	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.05		
Actuated Cycle Length (s)	109.5	Sum of lost time (s)	16.0
Intersection Capacity Utilization	95.2%	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)	150	670	290	90	500	160	310	1030	120	130	1150	190
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		3.0	5.5		3.0	5.5	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.95		1.00	0.96		1.00	0.98		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1778		1770	1795		1770	3484		1770	3464	
Flt Permitted	0.19	1.00		0.19	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	347	1778		347	1795		1770	3484		1770	3464	
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)	158	705	305	95	526	168	326	1084	126	137	1211	200
RTOR Reduction (vph)	0	20	0	0	15	0	0	11	0	0	14	0
Lane Group Flow (vph)	158	990	0	95	679	0	326	1199	0	137	1397	0
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		6			2		7	4		3	8	
Permitted Phases	6			2								
Actuated Green, G (s)	21.5	21.5		21.5	21.5		18.2	38.4		7.6	27.8	
Effective Green, g (s)	21.5	21.5		21.5	21.5		18.2	38.4		7.6	27.8	
Actuated g/C Ratio	0.27	0.27		0.27	0.27		0.23	0.48		0.10	0.35	
Clearance Time (s)	4.0	4.0		4.0	4.0		3.0	5.5		3.0	5.5	
Vehicle Extension (s)	2.5	2.5		2.5	2.5		1.0	4.5		1.0	4.5	
Lane Grp Cap (vph)	93	477		93	482		402	1672		168	1203	
v/s Ratio Prot		c0.56			0.38		c0.18	0.34		0.08	c0.40	
v/s Ratio Perm	0.46			0.27								
v/c Ratio	1.70	2.08		1.02	1.41		0.81	0.72		0.82	1.16	
Uniform Delay, d1	29.2	29.2		29.2	29.2		29.3	16.5		35.5	26.1	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	356.1	491.4		99.3	196.3		11.2	2.7		24.1	82.0	
Delay (s)	385.3	520.6		128.5	225.6		40.4	19.2		59.7	108.1	
Level of Service	F	F		F	F		D	B		E	F	
Approach Delay (s)		502.3			213.9			23.7			103.8	
Approach LOS		F			F			C			F	

Intersection Summary			
HCM 2000 Control Delay	189.0	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.36		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	12.5
Intersection Capacity Utilization	127.5%	ICU Level of Service	H
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)	200	380	220	110	450	50	250	1010	90	40	1010	210
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	3.5	4.5	4.5	3.5	4.5	4.5
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.91	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	1770	3539	1583	1770	5085	1583
Flt Permitted	0.27	1.00	1.00	0.36	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	510	1863	1583	664	1863	1583	1770	3539	1583	1770	5085	1583
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)	211	400	232	116	474	53	263	1063	95	42	1063	221
RTOR Reduction (vph)	0	0	145	0	0	33	0	0	56	0	0	125
Lane Group Flow (vph)	211	400	87	116	474	20	263	1063	39	42	1063	96
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases		2			6		7	4		3	8	
Permitted Phases	2		2	6		6			4			8
Actuated Green, G (s)	26.0	26.0	26.0	26.0	26.0	26.0	9.5	28.8	28.8	2.6	21.9	21.9
Effective Green, g (s)	26.0	26.0	26.0	26.0	26.0	26.0	9.5	28.8	28.8	2.6	21.9	21.9
Actuated g/C Ratio	0.37	0.37	0.37	0.37	0.37	0.37	0.14	0.41	0.41	0.04	0.32	0.32
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	3.5	4.5	4.5	3.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	2.0	2.5	2.5	2.0	2.5	2.5
Lane Grp Cap (vph)	191	697	593	248	697	593	242	1468	656	66	1604	499
v/s Ratio Prot		0.21			0.25		c0.15	c0.30		0.02	0.21	
v/s Ratio Perm	c0.41		0.05	0.17		0.01			0.02			0.06
v/c Ratio	1.10	0.57	0.15	0.47	0.68	0.03	1.09	0.72	0.06	0.64	0.66	0.19
Uniform Delay, d1	21.7	17.3	14.4	16.5	18.2	13.7	30.0	17.0	12.2	32.9	20.6	17.3
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	95.9	1.1	0.1	1.4	2.7	0.0	82.9	1.7	0.0	13.8	0.9	0.1
Delay (s)	117.6	18.4	14.5	17.8	20.9	13.8	112.9	18.7	12.2	46.8	21.5	17.4
Level of Service	F	B	B	B	C	B	F	B	B	D	C	B
Approach Delay (s)		42.2			19.8			35.7			21.6	
Approach LOS		D			B			D			C	

Intersection Summary			
HCM 2000 Control Delay	30.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.99		
Actuated Cycle Length (s)	69.4	Sum of lost time (s)	12.0
Intersection Capacity Utilization	81.9%	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)	200	380	220	110	450	50	250	1010	90	40	1010	210
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	3.5	4.5	4.5	3.5	4.5	4.5
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	1770	3539	1583	1770	3539	1583
Flt Permitted	0.26	1.00	1.00	0.34	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	485	1863	1583	642	1863	1583	1770	3539	1583	1770	3539	1583
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)	211	400	232	116	474	53	263	1063	95	42	1063	221
RTOR Reduction (vph)	0	0	148	0	0	34	0	0	54	0	0	100
Lane Group Flow (vph)	211	400	84	116	474	19	263	1063	41	42	1063	121
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases		2			6		7	4		3	8	
Permitted Phases	2		2	6		6			4			8
Actuated Green, G (s)	26.0	26.0	26.0	26.0	26.0	26.0	9.5	30.7	30.7	2.7	23.9	23.9
Effective Green, g (s)	26.0	26.0	26.0	26.0	26.0	26.0	9.5	30.7	30.7	2.7	23.9	23.9
Actuated g/C Ratio	0.36	0.36	0.36	0.36	0.36	0.36	0.13	0.43	0.43	0.04	0.33	0.33
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	3.5	4.5	4.5	3.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	2.0	2.5	2.5	2.0	2.5	2.5
Lane Grp Cap (vph)	176	678	576	233	678	576	235	1521	680	66	1184	529
v/s Ratio Prot		0.21			0.25		c0.15	0.30		0.02	c0.30	
v/s Ratio Perm	c0.43		0.05	0.18		0.01			0.03			0.08
v/c Ratio	1.20	0.59	0.15	0.50	0.70	0.03	1.12	0.70	0.06	0.64	0.90	0.23
Uniform Delay, d1	22.7	18.4	15.2	17.6	19.4	14.6	31.0	16.6	11.9	33.9	22.6	17.1
Progression Factor	1.00	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	131.5	1.3	0.1	1.7	3.2	0.0	94.5	1.3	0.0	13.8	9.2	0.2
Delay (s)	154.2	19.7	15.4	19.3	22.5	14.6	125.4	17.9	11.9	47.7	31.7	17.3
Level of Service	F	B	B	B	C	B	F	B	B	D	C	B
Approach Delay (s)		52.2			21.3			37.4			29.8	
Approach LOS		D			C			D			C	

Intersection Summary			
HCM 2000 Control Delay	35.5	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.06		
Actuated Cycle Length (s)	71.4	Sum of lost time (s)	12.0
Intersection Capacity Utilization	90.3%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

APPENDIX D: MITIGATION MEASURES LOS RESULTS

INTERSECTION LEVEL OF SERVICE
FUTURE (2035) CONDITIONS + MITIGATION MEASURES

Intersection	Control	Place Type	AM Peak		PM Peak	
			Delay	LOS	Delay	LOS
1. Garey Ave & Foothill Blvd	Signal	CMP Roadway	61	E	59	E
2. Garey Ave & Arrow Hwy	Signal	CMP Roadway	54	D	78	E
3. Towne Ave & Arrow Hwy	Signal	CMP Roadway	45	D	77	E
4. Garey Ave & McKinley Ave & I-10	Signal	CMP Roadway	38.4	D	73	E
5. Indian Hill Blvd & San Bernardino Ave	Signal	Other Area	32	C	59	E
6. Fairplex Dr & Holt Ave	Signal	CMP Roadway	58	E	73	E
7. Garey Ave & Holt Ave	Signal	High Volume Corridor	33	C	56	E
8. Towne Ave & Holt Ave	Signal	High Volume Corridor	31	C	57	E
9. Reservoir St & Holt Ave	Signal	High Volume Corridor	22	C	73	E
10. Indian Hill Blvd & Holt Ave	Signal	High Volume Corridor	25	C	43	D
11. Humane Way & Roselawn Ave	Signal	N/A	13	B	66	E
12. Roselawn Ave & Pomona Blvd	Signal	N/A	12	B	18.8	B
13. White Ave & Mission Blvd	Signal	Other Area	20	C	30	C
14. Garey Ave & Mission Blvd	Signal	Pedestrian-Oriented	30	C	52	D
15. Towne Ave & Mission Blvd	Signal	Other Area	12	B	22	C
16. Reservoir St & Mission Blvd	Signal	Other Area	10	B	32	C
17. East End Ave & Mission Blvd	Signal	Other Area	14	B	18	B
18. Pomona Blvd & West Temple Ave	Signal	Other Area	> 90	F	80	E
19. Mission Blvd & Temple Ave	Signal	Other Area	45	D	57	E
20. Phillips Ranch Rd & Rio Rancho Rd	Signal	Other Area	45	D	47	D
21. Garey Ave & Philadelphia St	Signal	High Volume Corridor	30	C	79	E
22. Reservoir St & Philadelphia St	Signal	Other Area	20	C	30	C

Notes:

1. Shaded cells indicate intersections operating below acceptable levels of service.

Source: Fehr & Peers, 2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	50	610	330	340	420	40	320	80	130	120	210	80
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.7	5.3		3.7	4.9		3.7	4.9		3.7	4.9	4.9
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	1.00
Frt	1.00	0.95		1.00	0.99		1.00	0.91		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3353		1770	3493		1770	3210		1770	3539	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3353		1770	3493		1770	3210		1770	3539	1583
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)	53	642	347	358	442	42	337	84	137	126	221	84
RTOR Reduction (vph)	0	46	0	0	4	0	0	107	0	0	0	75
Lane Group Flow (vph)	53	943	0	358	480	0	337	114	0	126	221	9
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												4
Actuated Green, G (s)	7.4	47.4		37.3	77.7		31.5	32.5		15.2	16.2	16.2
Effective Green, g (s)	7.4	47.4		37.3	77.7		31.5	32.5		15.2	16.2	16.2
Actuated g/C Ratio	0.05	0.32		0.25	0.52		0.21	0.22		0.10	0.11	0.11
Clearance Time (s)	3.7	5.3		3.7	4.9		3.7	4.9		3.7	4.9	4.9
Vehicle Extension (s)	3.0	2.5		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	87	1059		440	1809		371	695		179	382	170
v/s Ratio Prot	0.03	c0.28		c0.20	0.14		c0.19	0.04		0.07	c0.06	
v/s Ratio Perm												0.01
v/c Ratio	0.61	0.89		0.81	0.27		0.91	0.16		0.70	0.58	0.05
Uniform Delay, d1	69.9	48.8		53.1	20.2		57.8	47.7		65.2	63.7	60.0
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	11.5	11.3		11.0	0.4		25.1	0.1		11.9	2.1	0.1
Delay (s)	81.4	60.1		64.1	20.6		82.9	47.8		77.1	65.8	60.2
Level of Service	F	E		E	C		F	D		E	E	E
Approach Delay (s)		61.2			39.1			69.0			68.0	
Approach LOS		E			D			E			E	

Intersection Summary			
HCM 2000 Control Delay	57.2	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	17.6
Intersection Capacity Utilization	85.0%	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)	50	400	160	130	460	290	150	590	130	220	970	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	5.0		3.5	5.0		3.5	5.0	5.0	3.5	5.0	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	0.95	1.00	1.00	0.95	
Frt	1.00	0.96		1.00	0.94		1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	4868		1770	4790		1770	3539	1583	1770	3513	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	4868		1770	4790		1770	3539	1583	1770	3513	
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)	53	421	168	137	484	305	158	621	137	232	1021	53
RTOR Reduction (vph)	0	92	0	0	141	0	0	0	82	0	4	0
Lane Group Flow (vph)	53	497	0	137	648	0	158	621	55	232	1070	0
Turn Type	Prot	NA		Prot	NA		Prot	NA	Perm	Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases									2			
Actuated Green, G (s)	3.1	18.1		5.5	20.5		5.5	31.3	31.3	6.6	32.4	
Effective Green, g (s)	3.1	18.1		5.5	20.5		5.5	31.3	31.3	6.6	32.4	
Actuated g/C Ratio	0.04	0.23		0.07	0.26		0.07	0.40	0.40	0.08	0.41	
Clearance Time (s)	3.5	5.0		3.5	5.0		3.5	5.0	5.0	3.5	5.0	
Vehicle Extension (s)	2.0	3.0		2.0	3.0		2.0	3.0	3.0	2.0	3.0	
Lane Grp Cap (vph)	69	1122		124	1250		124	1411	631	148	1449	
v/s Ratio Prot	0.03	0.10		c0.08	c0.14		0.09	0.18		c0.13	c0.30	
v/s Ratio Perm									0.03			
v/c Ratio	0.77	0.44		1.10	0.52		1.27	0.44	0.09	1.57	0.74	
Uniform Delay, d1	37.3	25.9		36.5	24.8		36.5	17.2	14.7	36.0	19.5	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	36.0	0.3		111.8	0.4		171.8	1.0	0.3	285.5	3.4	
Delay (s)	73.3	26.2		148.3	25.1		208.3	18.2	15.0	321.4	22.9	
Level of Service	E	C		F	C		F	B	B	F	C	
Approach Delay (s)		30.1			43.4			50.5			75.9	
Approach LOS		C			D			D			E	

Intersection Summary			
HCM 2000 Control Delay	54.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	78.5	Sum of lost time (s)	17.0
Intersection Capacity Utilization	70.4%	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)	290	490	190	160	650	140	240	830	190	140	970	410
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	5.0		3.5	5.0	5.0	3.5	5.0		3.5	5.0	5.0
Lane Util. Factor	1.00	0.91		1.00	0.95	1.00	0.97	0.95		1.00	0.95	1.00
Frt	1.00	0.96		1.00	1.00	0.85	1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	4872		1770	3539	1583	3433	3440		1770	3539	1583
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	4872		1770	3539	1583	3433	3440		1770	3539	1583
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)	305	516	200	168	684	147	253	874	200	147	1021	432
RTOR Reduction (vph)	0	78	0	0	0	113	0	21	0	0	0	172
Lane Group Flow (vph)	305	638	0	168	684	34	253	1053	0	147	1021	260
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA		Prot	NA	Perm
Protected Phases	7	4		3	8		1	6		5	2	
Permitted Phases						8						2
Actuated Green, G (s)	13.5	22.7		11.1	20.3	20.3	6.8	29.2		8.3	30.7	30.7
Effective Green, g (s)	13.5	22.7		11.1	20.3	20.3	6.8	29.2		8.3	30.7	30.7
Actuated g/C Ratio	0.15	0.26		0.13	0.23	0.23	0.08	0.33		0.09	0.35	0.35
Clearance Time (s)	3.5	5.0		3.5	5.0	5.0	3.5	5.0		3.5	5.0	5.0
Vehicle Extension (s)	2.0	2.5		2.0	2.5	2.5	2.0	2.5		2.0	2.5	2.5
Lane Grp Cap (vph)	270	1252		222	813	363	264	1137		166	1230	550
v/s Ratio Prot	c0.17	0.13		0.09	c0.19		0.07	c0.31		c0.08	0.29	
v/s Ratio Perm						0.02						0.16
v/c Ratio	1.13	0.51		0.76	0.84	0.09	0.96	0.93		0.89	0.83	0.47
Uniform Delay, d1	37.4	28.0		37.3	32.5	26.8	40.6	28.5		39.5	26.4	22.5
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	94.3	0.2		12.3	7.8	0.1	43.2	13.9		37.9	6.6	2.9
Delay (s)	131.7	28.3		49.5	40.2	26.8	83.8	42.4		77.4	33.0	25.4
Level of Service	F	C		D	D	C	F	D		E	C	C
Approach Delay (s)		59.2			39.8			50.3			35.0	
Approach LOS		E			D			D			D	

Intersection Summary			
HCM 2000 Control Delay	45.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	88.3	Sum of lost time (s)	17.0
Intersection Capacity Utilization	85.8%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	EBR2	WBL2	WBL	WBT	WBR	NBL2	NBL	NBT	NBR
Lane Configurations												
Volume (vph)	10	230	20	30	10	80	240	30	200	270	870	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0				4.0	4.0			4.0	4.0	
Lane Util. Factor		0.95				1.00	1.00			0.97	0.95	
Frt		0.97				1.00	0.98			1.00	0.99	
Flt Protected		1.00				0.95	1.00			0.95	1.00	
Satd. Flow (prot)		3441				1770	1831			3433	3510	
Flt Permitted		1.00				0.95	1.00			0.95	1.00	
Satd. Flow (perm)		3441				1770	1831			3433	3510	
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)	11	242	21	32	11	84	253	32	211	284	916	53
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	5	0
Lane Group Flow (vph)	0	306	0	0	0	95	285	0	0	495	964	0
Turn Type	Split	NA			Split	Split	NA		Prot	Prot	NA	
Protected Phases	4	4			8	8	8		5	5	2	
Permitted Phases												
Actuated Green, G (s)		12.7				15.5	15.5			14.1	28.5	
Effective Green, g (s)		12.7				15.5	15.5			14.1	28.5	
Actuated g/C Ratio		0.15				0.18	0.18			0.17	0.33	
Clearance Time (s)		4.0				4.0	4.0			4.0	4.0	
Vehicle Extension (s)		3.0				3.0	3.0			3.0	3.0	
Lane Grp Cap (vph)		513				322	333			568	1175	
v/s Ratio Prot		c0.09				0.05	c0.16			c0.14	0.27	
v/s Ratio Perm												
v/c Ratio		0.60				0.30	0.86			0.87	0.82	
Uniform Delay, d1		33.8				30.1	33.7			34.6	26.0	
Progression Factor		1.00				1.00	1.00			1.00	1.00	
Incremental Delay, d2		1.9				0.5	18.9			13.7	4.7	
Delay (s)		35.7				30.6	52.6			48.4	30.7	
Level of Service		D				C	D			D	C	
Approach Delay (s)		35.7					47.1				36.7	
Approach LOS		D					D				D	

Intersection Summary			
HCM 2000 Control Delay	38.4	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	85.1	Sum of lost time (s)	16.0
Intersection Capacity Utilization	75.1%	ICU Level of Service	D
Analysis Period (min)	15		

dr Defacto Right Lane. Recode with 1 though lane as a right lane.
c Critical Lane Group

Movement	SBL	SBT	SBR	SBR2
Lane Configurations				
Volume (vph)	190	430	410	20
Ideal Flow (vphpl)	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		
Lane Util. Factor	1.00	0.95		
Frt	1.00	0.92		
Flt Protected	0.95	1.00		
Satd. Flow (prot)	1770	3274		
Flt Permitted	0.95	1.00		
Satd. Flow (perm)	1770	3274		
Peak-hour factor, PHF	0.95	0.95	0.95	0.95
Adj. Flow (vph)	200	453	432	21
RTOR Reduction (vph)	0	2	0	0
Lane Group Flow (vph)	200	904	0	0
Turn Type	Prot	NA		
Protected Phases	1	6		
Permitted Phases				
Actuated Green, G (s)	12.4	26.8		
Effective Green, g (s)	12.4	26.8		
Actuated g/C Ratio	0.15	0.31		
Clearance Time (s)	4.0	4.0		
Vehicle Extension (s)	3.0	3.0		
Lane Grp Cap (vph)	257	1031		
v/s Ratio Prot	0.11	c0.28		
v/s Ratio Perm				
v/c Ratio	0.78	0.91dr		
Uniform Delay, d1	35.0	27.6		
Progression Factor	1.00	1.00		
Incremental Delay, d2	13.8	8.5		
Delay (s)	48.8	36.1		
Level of Service	D	D		
Approach Delay (s)		38.4		
Approach LOS		D		

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	240	220	120	70	260	150	100	740	30	80	860	120
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.5	5.5	4.0	5.5	5.5	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95		1.00	0.95	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99		1.00	0.98	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	1770	3518		1770	3474	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.13	1.00		0.22	1.00	
Satd. Flow (perm)	1770	1863	1583	1770	1863	1583	238	3518		415	3474	
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)	253	232	126	74	274	158	105	779	32	84	905	126
RTOR Reduction (vph)	0	0	79	0	0	76	0	4	0	0	13	0
Lane Group Flow (vph)	253	232	47	74	274	82	105	807	0	84	1018	0
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			4			8	
Permitted Phases			2			6	4			8		
Actuated Green, G (s)	12.2	30.8	30.8	6.2	24.8	24.8	32.9	32.9		32.9	32.9	
Effective Green, g (s)	12.2	30.8	30.8	6.2	24.8	24.8	32.9	32.9		32.9	32.9	
Actuated g/C Ratio	0.15	0.37	0.37	0.07	0.30	0.30	0.39	0.39		0.39	0.39	
Clearance Time (s)	4.0	5.5	5.5	4.0	5.5	5.5	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	1.5	2.0	2.0	1.5	2.0	2.0	2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	258	688	584	131	553	470	93	1387		163	1370	
v/s Ratio Prot	c0.14	0.12		0.04	c0.15			0.23			0.29	
v/s Ratio Perm			0.03			0.05	c0.44			0.20		
v/c Ratio	0.98	0.34	0.08	0.56	0.50	0.17	1.13	0.58		0.52	0.74	
Uniform Delay, d1	35.5	18.9	17.1	37.3	24.1	21.7	25.3	19.8		19.2	21.6	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	50.3	1.3	0.3	3.3	3.2	0.8	132.4	0.4		1.1	1.9	
Delay (s)	85.8	20.3	17.4	40.6	27.3	22.5	157.6	20.3		20.3	23.6	
Level of Service	F	C	B	D	C	C	F	C		C	C	
Approach Delay (s)		46.8			27.8			36.0			23.3	
Approach LOS		D			C			D			C	

Intersection Summary			
HCM 2000 Control Delay	32.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	83.4	Sum of lost time (s)	13.5
Intersection Capacity Utilization	74.7%	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)	310	630	60	0	1300	80	550	650	190	160	0	660
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.7	4.9			4.9	4.9	3.7	4.9		4.0		4.0
Lane Util. Factor	0.97	0.95			0.95	1.00	0.97	0.95		1.00		0.88
Frt	1.00	0.99			1.00	0.85	1.00	0.97		1.00		0.85
Flt Protected	0.95	1.00			1.00	1.00	0.95	1.00		0.95		1.00
Satd. Flow (prot)	3433	3493			3539	1583	3433	3419		1770		2787
Flt Permitted	0.95	1.00			1.00	1.00	0.95	1.00		0.95		1.00
Satd. Flow (perm)	3433	3493			3539	1583	3433	3419		1770		2787
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)	326	663	63	0	1368	84	579	684	200	168	0	695
RTOR Reduction (vph)	0	5	0	0	0	51	0	21	0	0	0	32
Lane Group Flow (vph)	326	721	0	0	1368	33	579	863	0	168	0	663
Turn Type	Prot	NA			NA	Perm	Prot	NA		Prot		custom
Protected Phases	5	2			6		7	4		3		8 5
Permitted Phases						6						
Actuated Green, G (s)	12.3	67.4			51.4	51.4	24.2	32.8		15.1		41.2
Effective Green, g (s)	12.3	67.4			51.4	51.4	24.2	32.8		15.1		41.2
Actuated g/C Ratio	0.10	0.52			0.40	0.40	0.19	0.25		0.12		0.32
Clearance Time (s)	3.7	4.9			4.9	4.9	3.7	4.9		4.0		
Vehicle Extension (s)	2.5	5.0			5.0	5.0	2.5	4.0		3.0		
Lane Grp Cap (vph)	327	1823			1409	630	643	868		207		889
v/s Ratio Prot	c0.09	0.21			c0.39		0.17	c0.25		0.09		c0.24
v/s Ratio Perm						0.02						
v/c Ratio	1.00	0.40			0.97	0.05	0.90	0.99		0.81		0.75
Uniform Delay, d1	58.4	18.6			38.1	23.9	51.3	48.1		55.6		39.3
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00		1.00		1.00
Incremental Delay, d2	48.6	0.3			17.6	0.1	15.7	29.0		20.9		3.4
Delay (s)	107.0	18.9			55.7	24.0	67.0	77.1		76.5		42.7
Level of Service	F	B			E	C	E	E		E		D
Approach Delay (s)		46.2			53.9			73.1			49.3	
Approach LOS		D			D			E			D	

Intersection Summary			
HCM 2000 Control Delay	57.2	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.98		
Actuated Cycle Length (s)	129.1	Sum of lost time (s)	17.5
Intersection Capacity Utilization	92.5%	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)	90	430	100	100	600	130	140	700	70	110	840	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.0		3.0	4.5		3.0	4.5		3.0	4.5	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.97		1.00	0.97		1.00	0.99		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3439		1770	3445		1770	3491		1770	3504	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3439		1770	3445		1770	3491		1770	3504	
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)	95	453	105	105	632	137	147	737	74	116	884	63
RTOR Reduction (vph)	0	20	0	0	18	0	0	7	0	0	5	0
Lane Group Flow (vph)	95	538	0	105	751	0	147	804	0	116	942	0
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	6.9	24.8		7.9	25.3		10.7	38.8		7.7	35.8	
Effective Green, g (s)	6.9	24.8		7.9	25.3		10.7	38.8		7.7	35.8	
Actuated g/C Ratio	0.07	0.26		0.08	0.27		0.11	0.41		0.08	0.38	
Clearance Time (s)	3.0	4.0		3.0	4.5		3.0	4.5		3.0	4.5	
Vehicle Extension (s)	1.5	4.5		1.5	4.5		1.5	4.5		1.5	4.5	
Lane Grp Cap (vph)	130	910		149	930		202	1445		145	1338	
v/s Ratio Prot	0.05	0.16		c0.06	c0.22		0.08	c0.23		c0.07	c0.27	
v/s Ratio Perm												
v/c Ratio	0.73	0.59		0.70	0.81		0.73	0.56		0.80	0.70	
Uniform Delay, d1	42.5	30.0		41.8	31.9		40.1	20.9		42.2	24.5	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	16.5	1.4		11.7	5.8		10.5	1.6		24.9	3.1	
Delay (s)	59.0	31.4		53.4	37.7		50.6	22.4		67.1	27.6	
Level of Service	E	C		D	D		D	C		E	C	
Approach Delay (s)		35.4			39.6			26.8			31.9	
Approach LOS		D			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	33.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	93.7	Sum of lost time (s)	15.0
Intersection Capacity Utilization	72.8%	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)	50	400	60	60	560	100	100	750	60	160	1010	80
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.5		3.0	4.5		3.0	5.0		3.0	5.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.98		1.00	0.98		1.00	0.99		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3470		1770	3459		1770	3500		1770	3500	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3470		1770	3459		1770	3500		1770	3500	
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)	53	421	63	63	589	105	105	789	63	168	1063	84
RTOR Reduction (vph)	0	14	0	0	17	0	0	8	0	0	7	0
Lane Group Flow (vph)	53	470	0	63	677	0	105	844	0	168	1140	0
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases												
Actuated Green, G (s)	2.8	24.5		3.8	25.5		5.3	23.3		10.1	28.1	
Effective Green, g (s)	2.8	24.5		3.8	25.5		5.3	23.3		10.1	28.1	
Actuated g/C Ratio	0.04	0.32		0.05	0.33		0.07	0.30		0.13	0.36	
Clearance Time (s)	3.0	4.5		3.0	4.5		3.0	5.0		3.0	5.0	
Vehicle Extension (s)	1.5	2.5		1.5	2.5		1.5	2.5		1.5	2.5	
Lane Grp Cap (vph)	64	1101		87	1142		121	1056		231	1273	
v/s Ratio Prot	0.03	0.14		c0.04	c0.20		c0.06	0.24		c0.09	c0.33	
v/s Ratio Perm												
v/c Ratio	0.83	0.43		0.72	0.59		0.87	0.80		0.73	0.90	
Uniform Delay, d1	37.0	20.8		36.2	21.5		35.6	24.8		32.2	23.2	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	54.0	1.2		22.1	2.3		42.6	4.2		9.3	8.4	
Delay (s)	90.9	22.0		58.3	23.8		78.2	29.0		41.5	31.6	
Level of Service	F	C		E	C		E	C		D	C	
Approach Delay (s)		28.8			26.7			34.4			32.9	
Approach LOS		C			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	31.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	77.2	Sum of lost time (s)	15.5
Intersection Capacity Utilization	72.6%	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)	10	480	200	340	510	10	280	10	350	10	10	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5		3.5	5.5			4.0	4.0		4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00		1.00	
Frt	1.00	0.96		1.00	1.00			1.00	0.85		0.96	
Flt Protected	0.95	1.00		0.95	1.00			0.95	1.00		0.98	
Satd. Flow (prot)	1770	3383		1770	3529			1777	1583		1750	
Flt Permitted	0.45	1.00		0.95	1.00			0.71	1.00		0.89	
Satd. Flow (perm)	833	3383		1770	3529			1322	1583		1584	
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)	11	505	211	358	537	11	295	11	368	11	11	11
RTOR Reduction (vph)	0	76	0	0	2	0	0	0	258	0	8	0
Lane Group Flow (vph)	11	640	0	358	546	0	0	306	110	0	25	0
Turn Type	Perm	NA		Prot	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		6		5	2			4			8	
Permitted Phases	6						4		4	8		
Actuated Green, G (s)	16.5	16.5		12.5	32.5			18.0	18.0		18.0	
Effective Green, g (s)	16.5	16.5		12.5	32.5			18.0	18.0		18.0	
Actuated g/C Ratio	0.28	0.28		0.21	0.54			0.30	0.30		0.30	
Clearance Time (s)	5.5	5.5		3.5	5.5			4.0	4.0		4.0	
Vehicle Extension (s)	4.5	4.5		3.0	4.5			3.0	3.0		3.0	
Lane Grp Cap (vph)	229	930		368	1911			396	474		475	
v/s Ratio Prot		c0.19		c0.20	0.15							
v/s Ratio Perm	0.01							c0.23	0.07		0.02	
v/c Ratio	0.05	0.69		0.97	0.29			0.77	0.23		0.05	
Uniform Delay, d1	16.0	19.4		23.6	7.5			19.1	15.8		14.9	
Progression Factor	1.00	1.00		1.00	1.00			0.59	0.14		1.00	
Incremental Delay, d2	0.4	4.1		39.4	0.4			8.5	0.2		0.0	
Delay (s)	16.4	23.6		63.0	7.8			19.8	2.4		15.0	
Level of Service	B	C		E	A			B	A		B	
Approach Delay (s)		23.5			29.6			10.3			15.0	
Approach LOS		C			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	21.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	72.5%	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)	380	660	20	20	660	190	10	20	10	310	80	570
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	5.5		3.5	5.5			5.0		5.0	5.0	3.5
Lane Util. Factor	0.97	0.95		1.00	0.95			0.95		1.00	1.00	1.00
Frt	1.00	1.00		1.00	0.97			0.96		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.99		0.95	1.00	1.00
Satd. Flow (prot)	3433	3524		1770	3421			3360		1770	1863	1583
Flt Permitted	0.95	1.00		0.95	1.00			0.91		0.73	1.00	1.00
Satd. Flow (perm)	3433	3524		1770	3421			3082		1355	1863	1583
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)	400	695	21	21	695	200	11	21	11	326	84	600
RTOR Reduction (vph)	0	3	0	0	38	0	0	8	0	0	0	27
Lane Group Flow (vph)	400	713	0	21	857	0	0	35	0	326	84	573
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA	pt+ov
Protected Phases	1	6		5	2			8			4	1 4
Permitted Phases							8			4		
Actuated Green, G (s)	8.5	30.1		0.9	22.5			20.1		20.1	20.1	33.6
Effective Green, g (s)	8.5	30.1		0.9	22.5			20.1		20.1	20.1	28.6
Actuated g/C Ratio	0.13	0.46		0.01	0.35			0.31		0.31	0.31	0.44
Clearance Time (s)	3.5	5.5		3.5	5.5			5.0		5.0	5.0	
Vehicle Extension (s)	2.5	4.5		1.5	4.5			2.5		3.0	3.0	
Lane Grp Cap (vph)	448	1629		24	1182			951		418	575	695
v/s Ratio Prot	c0.12	0.20		0.01	c0.25						0.05	c0.36
v/s Ratio Perm								0.01		0.24		
v/c Ratio	0.89	0.44		0.88	0.73			0.04		0.78	0.15	0.82
Uniform Delay, d1	27.9	11.8		32.0	18.6			15.7		20.5	16.3	16.0
Progression Factor	1.00	1.00		1.00	1.00			1.00		1.00	1.00	1.00
Incremental Delay, d2	19.6	0.9		124.9	3.9			0.0		8.9	0.1	7.7
Delay (s)	47.4	12.7		156.9	22.5			15.7		29.4	16.4	23.7
Level of Service	D	B		F	C			B		C	B	C
Approach Delay (s)		25.1			25.6			15.7			24.9	
Approach LOS		C			C			B			C	

Intersection Summary			
HCM 2000 Control Delay	25.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	65.1	Sum of lost time (s)	14.0
Intersection Capacity Utilization	76.7%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	120	140	250	600	330	480
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.85	0.90		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1770	1583	1685		1770	1863
Flt Permitted	0.95	1.00	1.00		0.27	1.00
Satd. Flow (perm)	1770	1583	1685		495	1863
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	126	147	263	632	347	505
RTOR Reduction (vph)	0	129	73	0	0	0
Lane Group Flow (vph)	126	18	822	0	347	505
Turn Type	NA	Perm	NA		Perm	NA
Protected Phases	8		2			6
Permitted Phases		8			6	
Actuated Green, G (s)	12.2	12.2	79.6		79.6	79.6
Effective Green, g (s)	12.2	12.2	79.6		79.6	79.6
Actuated g/C Ratio	0.12	0.12	0.80		0.80	0.80
Clearance Time (s)	4.0	4.0	4.0		4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	216	193	1343		394	1485
v/s Ratio Prot	c0.07		0.49			0.27
v/s Ratio Perm		0.01			c0.70	
v/c Ratio	0.58	0.09	0.61		0.88	0.34
Uniform Delay, d1	41.4	38.9	4.0		6.9	2.8
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	4.0	0.2	0.8		19.9	0.1
Delay (s)	45.4	39.1	4.8		26.8	2.9
Level of Service	D	D	A		C	A
Approach Delay (s)	42.0		4.8			12.6
Approach LOS	D		A			B

Intersection Summary			
HCM 2000 Control Delay	13.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	99.8	Sum of lost time (s)	8.0
Intersection Capacity Utilization	85.0%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	20	260	10	10	860	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		0.95	1.00	
Frt	1.00	0.85		1.00	0.99	
Flt Protected	1.00	1.00		0.98	0.96	
Satd. Flow (prot)	1863	1583		3453	1764	
Flt Permitted	1.00	1.00		0.86	0.96	
Satd. Flow (perm)	1863	1583		3042	1764	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	21	274	11	11	905	63
RTOR Reduction (vph)	0	237	0	0	3	0
Lane Group Flow (vph)	21	37	0	22	965	0
Turn Type	NA	Perm	Perm	NA	NA	
Protected Phases	4			8	2	
Permitted Phases		4	8			
Actuated Green, G (s)	8.1	8.1		8.1	43.9	
Effective Green, g (s)	8.1	8.1		8.1	43.9	
Actuated g/C Ratio	0.13	0.13		0.13	0.73	
Clearance Time (s)	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	251	213		410	1290	
v/s Ratio Prot	0.01				c0.55	
v/s Ratio Perm		c0.02		0.01		
v/c Ratio	0.08	0.17		0.05	0.75	
Uniform Delay, d1	22.7	23.0		22.6	4.8	
Progression Factor	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.1	0.4		0.1	4.0	
Delay (s)	22.8	23.4		22.7	8.8	
Level of Service	C	C		C	A	
Approach Delay (s)	23.3			22.7	8.8	
Approach LOS	C			C	A	

Intersection Summary			
HCM 2000 Control Delay	12.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	65.2%	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)	70	450	90	50	490	110	110	780	40	100	590	100
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0		4.0	5.0		4.0	5.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.97		1.00	0.97		1.00	0.99		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3451		1770	3442		1770	3513		1770	3462	
Flt Permitted	0.29	1.00		0.33	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	533	3451		623	3442		1770	3513		1770	3462	
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)	74	474	95	53	516	116	116	821	42	105	621	105
RTOR Reduction (vph)	0	25	0	0	29	0	0	5	0	0	16	0
Lane Group Flow (vph)	74	544	0	53	603	0	116	858	0	105	710	0
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)	18.4	18.4		18.4	18.4		5.3	27.6		5.3	27.6	
Effective Green, g (s)	18.4	18.4		18.4	18.4		5.3	27.6		5.3	27.6	
Actuated g/C Ratio	0.28	0.28		0.28	0.28		0.08	0.42		0.08	0.42	
Clearance Time (s)	5.0	5.0		5.0	5.0		4.0	5.0		4.0	5.0	
Vehicle Extension (s)	3.5	3.5		3.5	3.5		2.0	4.0		2.0	4.0	
Lane Grp Cap (vph)	150	972		175	969		143	1484		143	1463	
v/s Ratio Prot		0.16			c0.18		c0.07	c0.24		0.06	0.21	
v/s Ratio Perm	0.14			0.09								
v/c Ratio	0.49	0.56		0.30	0.62		0.81	0.58		0.73	0.49	
Uniform Delay, d1	19.6	20.0		18.4	20.4		29.5	14.4		29.3	13.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	3.0	0.8		1.2	1.3		27.0	1.6		15.4	1.2	
Delay (s)	22.6	20.8		19.6	21.7		56.5	16.1		44.7	14.8	
Level of Service	C	C		B	C		E	B		D	B	
Approach Delay (s)		21.0			21.6			20.8			18.6	
Approach LOS		C			C			C			B	

Intersection Summary			
HCM 2000 Control Delay	20.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	65.3	Sum of lost time (s)	14.0
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)	90	410	140	100	510	120	180	740	140	60	630	160
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	5.0		3.0	5.0		3.0	5.0		3.0	5.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.96		1.00	0.97		1.00	0.98		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3404		1770	3438		1770	3455		1770	3432	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3404		1770	3438		1770	3455		1770	3432	
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)	95	432	147	105	537	126	189	779	147	63	663	168
RTOR Reduction (vph)	0	48	0	0	29	0	0	20	0	0	31	0
Lane Group Flow (vph)	95	531	0	105	634	0	189	906	0	63	800	0
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												
Actuated Green, G (s)	4.6	20.1		4.6	20.1		8.7	25.2		3.5	20.0	
Effective Green, g (s)	4.6	20.1		4.6	20.1		8.7	25.2		3.5	20.0	
Actuated g/C Ratio	0.07	0.29		0.07	0.29		0.13	0.36		0.05	0.29	
Clearance Time (s)	3.0	5.0		3.0	5.0		3.0	5.0		3.0	5.0	
Vehicle Extension (s)	1.5	4.0		1.5	4.0		1.5	4.0		1.5	4.0	
Lane Grp Cap (vph)	117	985		117	995		221	1254		89	989	
v/s Ratio Prot	0.05	0.16		c0.06	c0.18		c0.11	0.26		0.04	c0.23	
v/s Ratio Perm												
v/c Ratio	0.81	0.54		0.90	0.64		0.86	0.72		0.71	0.81	
Uniform Delay, d1	32.0	20.8		32.2	21.5		29.7	19.1		32.4	22.9	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	31.8	2.1		51.2	3.1		25.3	2.2		18.9	5.2	
Delay (s)	63.8	22.9		83.4	24.6		55.0	21.3		51.3	28.1	
Level of Service	E	C		F	C		E	C		D	C	
Approach Delay (s)		28.6			32.6			27.0			29.8	
Approach LOS		C			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	29.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	69.4	Sum of lost time (s)	16.0
Intersection Capacity Utilization	70.4%	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)	90	390	30	60	620	110	100	870	70	120	610	110
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.99		1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	3501		1770	3459		1770	1863	1583	1770	1863	1583
Flt Permitted	0.21	1.00		0.44	1.00		0.30	1.00	1.00	0.11	1.00	1.00
Satd. Flow (perm)	386	3501		816	3459		556	1863	1583	208	1863	1583
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)	95	411	32	63	653	116	105	916	74	126	642	116
RTOR Reduction (vph)	0	7	0	0	19	0	0	0	32	0	0	15
Lane Group Flow (vph)	95	436	0	63	750	0	105	916	42	126	642	101
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)	19.3	19.3		19.3	19.3		38.6	38.6	38.6	38.6	38.6	38.6
Effective Green, g (s)	19.3	19.3		19.3	19.3		38.6	38.6	38.6	38.6	38.6	38.6
Actuated g/C Ratio	0.28	0.28		0.28	0.28		0.57	0.57	0.57	0.57	0.57	0.57
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		4.0	4.0	4.0	3.0	3.0	3.0
Lane Grp Cap (vph)	109	995		231	983		316	1059	899	118	1059	899
v/s Ratio Prot		0.12			0.22			0.49			0.34	
v/s Ratio Perm	c0.25			0.08			0.19		0.03	c0.61		0.06
v/c Ratio	0.87	0.44		0.27	0.76		0.33	0.86	0.05	1.07	0.61	0.11
Uniform Delay, d1	23.1	19.9		18.9	22.2		7.8	12.4	6.5	14.7	9.6	6.8
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	48.3	0.3		0.6	3.6		0.8	7.8	0.0	102.2	1.0	0.1
Delay (s)	71.5	20.2		19.5	25.8		8.6	20.2	6.5	116.9	10.6	6.8
Level of Service	E	C		B	C		A	C	A	F	B	A
Approach Delay (s)		29.2			25.3			18.2			25.3	
Approach LOS		C			C			B			C	

Intersection Summary			
HCM 2000 Control Delay	23.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	1.00		
Actuated Cycle Length (s)	67.9	Sum of lost time (s)	10.0
Intersection Capacity Utilization	97.3%	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)	70	430	100	80	530	60	160	570	110	40	470	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0		4.5	4.5		4.5	4.5	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.97		1.00	0.98		1.00	0.98		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3439		1770	3485		1770	3453		1770	3470	
Flt Permitted	0.39	1.00		0.42	1.00		0.38	1.00		0.29	1.00	
Satd. Flow (perm)	718	3439		789	3485		707	3453		535	3470	
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)	74	453	105	84	558	63	168	600	116	42	495	74
RTOR Reduction (vph)	0	27	0	0	12	0	0	33	0	0	24	0
Lane Group Flow (vph)	74	531	0	84	609	0	168	683	0	42	545	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Actuated Green, G (s)	28.1	28.1		28.1	28.1		22.4	22.4		22.4	22.4	
Effective Green, g (s)	28.1	28.1		28.1	28.1		22.4	22.4		22.4	22.4	
Actuated g/C Ratio	0.47	0.47		0.47	0.47		0.37	0.37		0.37	0.37	
Clearance Time (s)	5.0	5.0		5.0	5.0		4.5	4.5		4.5	4.5	
Vehicle Extension (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Grp Cap (vph)	336	1610		369	1632		263	1289		199	1295	
v/s Ratio Prot		0.15			c0.17			0.20			0.16	
v/s Ratio Perm	0.10			0.11			c0.24			0.08		
v/c Ratio	0.22	0.33		0.23	0.37		0.64	0.53		0.21	0.42	
Uniform Delay, d1	9.5	10.0		9.5	10.3		15.5	14.7		12.8	14.0	
Progression Factor	1.00	1.00		0.69	0.65		1.00	1.00		0.22	0.35	
Incremental Delay, d2	1.5	0.5		1.4	0.6		5.6	0.5		0.4	0.2	
Delay (s)	11.0	10.6		7.9	7.3		21.1	15.2		3.2	5.1	
Level of Service	B	B		A	A		C	B		A	A	
Approach Delay (s)		10.6			7.4			16.3			5.0	
Approach LOS		B			A			B			A	

Intersection Summary			
HCM 2000 Control Delay	10.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	9.5
Intersection Capacity Utilization	64.8%	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)	160	440	30	40	510	140	50	340	30	140	260	140
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5		5.5	5.5		4.5	4.5		4.5	4.5	4.5
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.99		1.00	0.97		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3505		1770	3425		1770	1840		1770	1863	1583
Flt Permitted	0.37	1.00		0.47	1.00		0.50	1.00		0.33	1.00	1.00
Satd. Flow (perm)	691	3505		877	3425		927	1840		620	1863	1583
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)	168	463	32	42	537	147	53	358	32	147	274	147
RTOR Reduction (vph)	0	7	0	0	36	0	0	6	0	0	0	101
Lane Group Flow (vph)	168	488	0	42	648	0	53	384	0	147	274	46
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		2			2			4			4	
Permitted Phases	2			2			4			4		4
Actuated Green, G (s)	31.4	31.4		31.4	31.4		18.6	18.6		18.6	18.6	18.6
Effective Green, g (s)	31.4	31.4		31.4	31.4		18.6	18.6		18.6	18.6	18.6
Actuated g/C Ratio	0.52	0.52		0.52	0.52		0.31	0.31		0.31	0.31	0.31
Clearance Time (s)	5.5	5.5		5.5	5.5		4.5	4.5		4.5	4.5	4.5
Vehicle Extension (s)	4.0	4.0		4.0	4.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	361	1834		458	1792		287	570		192	577	490
v/s Ratio Prot		0.14			0.19			0.21			0.15	
v/s Ratio Perm	c0.24			0.05			0.06			c0.24		0.03
v/c Ratio	0.47	0.27		0.09	0.36		0.18	0.67		0.77	0.47	0.09
Uniform Delay, d1	9.0	7.9		7.2	8.4		15.2	18.1		18.7	16.7	14.7
Progression Factor	0.80	0.67		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	4.1	0.3		0.4	0.6		0.3	3.1		16.5	0.6	0.1
Delay (s)	11.3	5.7		7.6	9.0		15.5	21.2		35.2	17.4	14.8
Level of Service	B	A		A	A		B	C		D	B	B
Approach Delay (s)		7.1			8.9			20.5			21.3	
Approach LOS		A			A			C			C	

Intersection Summary			
HCM 2000 Control Delay	13.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	71.6%	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)	190	310	1290	280	1170	60	780	150	190	190	230	520
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	5.5	5.5	3.0	5.5		5.0	5.0		5.0	5.0	5.0
Lane Util. Factor	0.97	0.91	0.88	1.00	0.91		1.00	0.95		0.95	0.95	1.00
Frt	1.00	1.00	0.85	1.00	0.99		1.00	0.92		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)	3433	5085	2787	1770	5048		1770	3243		1681	1763	1583
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)	3433	5085	2787	1770	5048		1770	3243		1681	1763	1583
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)	200	326	1358	295	1232	63	821	158	200	200	242	547
RTOR Reduction (vph)	0	0	956	0	4	0	0	134	0	0	0	76
Lane Group Flow (vph)	200	326	402	295	1291	0	821	224	0	180	262	471
Turn Type	Prot	NA	Perm	Prot	NA		Split	NA		Split	NA	Perm
Protected Phases	1	6		5	2		4	4		8	8	
Permitted Phases			6									8
Actuated Green, G (s)	6.0	28.5	28.5	13.0	35.5		48.0	48.0		37.0	37.0	37.0
Effective Green, g (s)	6.0	28.5	28.5	13.0	35.5		48.0	48.0		37.0	37.0	37.0
Actuated g/C Ratio	0.04	0.20	0.20	0.09	0.24		0.33	0.33		0.26	0.26	0.26
Clearance Time (s)	3.0	5.5	5.5	3.0	5.5		5.0	5.0		5.0	5.0	5.0
Vehicle Extension (s)	1.5	4.5	4.5	1.5	4.5		2.5	2.5		2.5	2.5	2.5
Lane Grp Cap (vph)	142	999	547	158	1235		585	1073		428	449	403
v/s Ratio Prot	0.06	0.06		c0.17	c0.26		c0.46	0.07		0.11	0.15	
v/s Ratio Perm			0.14									c0.30
v/c Ratio	1.41	0.33	0.73	1.87	1.05		1.40	0.21		0.42	0.58	1.17
Uniform Delay, d1	69.5	50.0	54.7	66.0	54.8		48.5	34.9		45.1	47.3	54.0
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	220.3	0.9	8.5	413.3	38.4		191.7	0.1		0.5	1.6	99.6
Delay (s)	289.8	50.9	63.2	479.3	93.1		240.2	34.9		45.5	48.9	153.6
Level of Service	F	D	E	F	F		F	C		D	D	F
Approach Delay (s)		85.1			164.8			177.9			106.2	
Approach LOS		F			F			F			F	

Intersection Summary			
HCM 2000 Control Delay	130.6	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.32		
Actuated Cycle Length (s)	145.0	Sum of lost time (s)	18.5
Intersection Capacity Utilization	112.3%	ICU Level of Service	H
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)	530	300	410	90	1330	400	220	210	30	280	480	750
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	6.0		3.0	6.0	3.0	3.0	6.0		3.0	6.0	3.0
Lane Util. Factor	0.97	0.95		1.00	0.91	1.00	0.97	0.95		0.97	0.95	1.00
Frt	1.00	0.91		1.00	1.00	0.85	1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3433	3233		1770	5085	1583	3433	3472		3433	3539	1583
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3433	3233		1770	5085	1583	3433	3472		3433	3539	1583
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)	558	316	432	95	1400	421	232	221	32	295	505	789
RTOR Reduction (vph)	0	186	0	0	0	61	0	13	0	0	0	43
Lane Group Flow (vph)	558	562	0	95	1400	360	232	240	0	295	505	746
Turn Type	Prot	NA		Prot	NA	pm+ov	Prot	NA		Prot	NA	pm+ov
Protected Phases	1	6		5	2	7	3	8		7	4	1
Permitted Phases						2						4
Actuated Green, G (s)	17.0	36.8		6.9	26.7	37.8	6.0	13.2		11.1	18.3	35.3
Effective Green, g (s)	17.0	36.8		6.9	26.7	37.8	6.0	13.2		11.1	18.3	35.3
Actuated g/C Ratio	0.20	0.43		0.08	0.31	0.44	0.07	0.15		0.13	0.21	0.41
Clearance Time (s)	3.0	6.0		3.0	6.0	3.0	3.0	6.0		3.0	6.0	3.0
Vehicle Extension (s)	1.5	4.0		1.5	4.0	1.5	1.5	4.0		1.5	4.0	1.5
Lane Grp Cap (vph)	678	1383		142	1578	695	239	532		443	753	649
v/s Ratio Prot	0.16	0.17		0.05	c0.28	0.07	c0.07	0.07		c0.09	0.14	c0.23
v/s Ratio Perm						0.16						0.24
v/c Ratio	0.82	0.41		0.67	0.89	0.52	0.97	0.45		0.67	0.67	1.15
Uniform Delay, d1	33.1	17.0		38.4	28.2	17.5	39.9	33.1		35.7	31.1	25.3
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	7.6	0.3		8.9	6.6	0.3	49.6	0.8		2.9	2.6	84.3
Delay (s)	40.7	17.3		47.3	34.8	17.8	89.5	33.9		38.6	33.7	109.6
Level of Service	D	B		D	C	B	F	C		D	C	F
Approach Delay (s)		27.3			31.7			60.5			72.3	
Approach LOS		C			C			E			E	

Intersection Summary			
HCM 2000 Control Delay	45.4	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.03		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	90.1%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	780	360	800	710	310	730
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.88	0.95	1.00	1.00	0.95
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	3433	2787	3539	1583	1770	3539
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	3433	2787	3539	1583	1770	3539
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	821	379	842	747	326	768
RTOR Reduction (vph)	0	236	0	420	0	0
Lane Group Flow (vph)	821	143	842	327	326	768
Turn Type	NA	Prot	NA	Perm	Prot	NA
Protected Phases	8	8	2		1	6
Permitted Phases				2		
Actuated Green, G (s)	30.2	30.2	55.3	55.3	22.2	81.5
Effective Green, g (s)	30.2	30.2	55.3	55.3	22.2	81.5
Actuated g/C Ratio	0.24	0.24	0.43	0.43	0.17	0.64
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	813	660	1534	686	308	2262
v/s Ratio Prot	c0.24	0.05	c0.24		c0.18	0.22
v/s Ratio Perm				0.21		
v/c Ratio	1.01	0.22	0.55	0.48	1.06	0.34
Uniform Delay, d1	48.7	39.1	26.8	25.8	52.6	10.6
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	34.0	0.2	1.4	2.4	67.5	0.4
Delay (s)	82.7	39.3	28.2	28.1	120.2	11.0
Level of Service	F	D	C	C	F	B
Approach Delay (s)	69.0		28.2			43.5
Approach LOS	E		C			D

Intersection Summary			
HCM 2000 Control Delay	45.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	127.5	Sum of lost time (s)	16.0
Intersection Capacity Utilization	71.5%	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)	160	390	240	140	430	130	130	950	40	90	700	130
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	3.0	5.5		3.0	5.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95		1.00	0.95	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99		1.00	0.98	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	1770	3518		1770	3456	
Flt Permitted	0.24	1.00	1.00	0.29	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	450	1863	1583	545	1863	1583	1770	3518		1770	3456	
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)	168	411	253	147	453	137	137	1000	42	95	737	137
RTOR Reduction (vph)	0	0	168	0	0	91	0	3	0	0	17	0
Lane Group Flow (vph)	168	411	85	147	453	46	137	1039	0	95	857	0
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Prot	NA		Prot	NA	
Protected Phases		6			2		7	4		3	8	
Permitted Phases	6		6	2		2						
Actuated Green, G (s)	26.8	26.8	26.8	26.8	26.8	26.8	8.4	34.6		6.1	32.3	
Effective Green, g (s)	26.8	26.8	26.8	26.8	26.8	26.8	8.4	34.6		6.1	32.3	
Actuated g/C Ratio	0.34	0.34	0.34	0.34	0.34	0.34	0.11	0.43		0.08	0.40	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	3.0	5.5		3.0	5.5	
Vehicle Extension (s)	2.5	2.5	2.5	2.5	2.5	2.5	1.0	4.5		1.0	4.5	
Lane Grp Cap (vph)	150	624	530	182	624	530	185	1521		134	1395	
v/s Ratio Prot		0.22			0.24		c0.08	c0.30		0.05	0.25	
v/s Ratio Perm	c0.37		0.05	0.27		0.03						
v/c Ratio	1.12	0.66	0.16	0.81	0.73	0.09	0.74	0.68		0.71	0.61	
Uniform Delay, d1	26.6	22.7	18.7	24.3	23.4	18.2	34.7	18.3		36.1	18.9	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	109.3	2.2	0.1	21.9	3.9	0.1	13.0	2.5		13.1	2.0	
Delay (s)	135.9	24.9	18.8	46.1	27.3	18.3	47.7	20.8		49.2	20.9	
Level of Service	F	C	B	D	C	B	D	C		D	C	
Approach Delay (s)		45.5			29.4			23.9			23.7	
Approach LOS		D			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	29.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	12.5
Intersection Capacity Utilization	78.6%	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)	150	200	110	90	320	40	110	1010	90	30	820	90
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	3.5	4.5	4.5	3.5	4.5	4.5
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.91	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	1770	3539	1583	1770	5085	1583
Flt Permitted	0.46	1.00	1.00	0.61	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	865	1863	1583	1133	1863	1583	1770	3539	1583	1770	5085	1583
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)	158	211	116	95	337	42	116	1063	95	32	863	95
RTOR Reduction (vph)	0	0	68	0	0	25	0	0	61	0	0	65
Lane Group Flow (vph)	158	211	48	95	337	17	116	1063	34	32	863	30
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases		2			6		7	4		3	8	
Permitted Phases	2		2	6		6			4			8
Actuated Green, G (s)	24.7	24.7	24.7	24.7	24.7	24.7	4.5	21.5	21.5	1.8	18.8	18.8
Effective Green, g (s)	24.7	24.7	24.7	24.7	24.7	24.7	4.5	21.5	21.5	1.8	18.8	18.8
Actuated g/C Ratio	0.41	0.41	0.41	0.41	0.41	0.41	0.08	0.36	0.36	0.03	0.31	0.31
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	3.5	4.5	4.5	3.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	2.0	2.5	2.5	2.0	2.5	2.5
Lane Grp Cap (vph)	356	766	651	466	766	651	132	1268	567	53	1593	496
v/s Ratio Prot		0.11			0.18		c0.07	c0.30		0.02	0.17	
v/s Ratio Perm	c0.18		0.03	0.08		0.01			0.02			0.02
v/c Ratio	0.44	0.28	0.07	0.20	0.44	0.03	0.88	0.84	0.06	0.60	0.54	0.06
Uniform Delay, d1	12.7	11.7	10.7	11.3	12.7	10.5	27.5	17.7	12.6	28.7	17.0	14.4
Progression Factor	1.00	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	4.0	0.9	0.2	0.2	0.4	0.0	42.5	4.9	0.0	12.6	0.3	0.0
Delay (s)	16.7	12.6	10.9	11.6	13.1	10.5	70.0	22.6	12.7	41.3	17.3	14.5
Level of Service	B	B	B	B	B	B	E	C	B	D	B	B
Approach Delay (s)		13.5			12.6			26.2			17.8	
Approach LOS		B			B			C			B	

Intersection Summary			
HCM 2000 Control Delay	19.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	70.2%	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)	160	820	420	240	900	40	480	260	210	100	170	80
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.7	5.3		3.7	4.9		3.7	5.3		3.7	4.9	4.9
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	1.00
Frt	1.00	0.95		1.00	0.99		1.00	0.93		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3359		1770	3517		1770	3302		1770	3539	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3359		1770	3517		1770	3302		1770	3539	1583
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)	168	863	442	253	947	42	505	274	221	105	179	84
RTOR Reduction (vph)	0	41	0	0	2	0	0	121	0	0	0	75
Lane Group Flow (vph)	168	1264	0	253	987	0	505	374	0	105	179	9
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												4
Actuated Green, G (s)	16.9	51.0		18.3	52.8		37.4	20.5		30.6	14.1	14.1
Effective Green, g (s)	16.9	51.0		18.3	52.8		37.4	20.5		30.6	14.1	14.1
Actuated g/C Ratio	0.12	0.37		0.13	0.38		0.27	0.15		0.22	0.10	0.10
Clearance Time (s)	3.7	5.3		3.7	4.9		3.7	5.3		3.7	4.9	4.9
Vehicle Extension (s)	3.0	2.5		3.0	3.0		3.0	2.5		3.0	3.0	3.0
Lane Grp Cap (vph)	216	1237		234	1341		478	489		391	360	161
v/s Ratio Prot	0.09	c0.38		c0.14	0.28		c0.29	0.11		0.06	c0.05	
v/s Ratio Perm												0.01
v/c Ratio	0.78	1.02		1.08	0.74		1.06	0.76		0.27	0.50	0.05
Uniform Delay, d1	58.9	43.7		60.0	36.8		50.5	56.6		44.6	58.8	56.1
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	16.0	31.2		82.1	2.1		56.9	6.7		0.4	1.1	0.1
Delay (s)	75.0	74.9		142.2	38.9		107.4	63.3		45.0	59.9	56.3
Level of Service	E	E		F	D		F	E		D	E	E
Approach Delay (s)		74.9			60.0			85.6			54.8	
Approach LOS		E			E			F			D	

Intersection Summary			
HCM 2000 Control Delay	71.2	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.98		
Actuated Cycle Length (s)	138.4	Sum of lost time (s)	18.0
Intersection Capacity Utilization	95.9%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
2: Garey Ave & Arrow Hwy 2/15/2013

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	130	1390	280	160	820	330	310	890	280	310	880	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	5.0		3.5	5.0		3.5	5.0	5.0	3.5	5.0	
Lane Util. Factor	1.00	0.91		1.00	0.91		1.00	0.95	1.00	1.00	0.95	
Frt	1.00	0.97		1.00	0.96		1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	4957		1770	4867		1770	3539	1583	1770	3510	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	4957		1770	4867		1770	3539	1583	1770	3510	
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)	137	1463	295	168	863	347	326	937	295	326	926	53
RTOR Reduction (vph)	0	27	0	0	62	0	0	0	131	0	4	0
Lane Group Flow (vph)	137	1731	0	168	1148	0	326	937	164	326	975	0
Turn Type	Prot	NA		Prot	NA		Prot	NA	Perm	Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases									2			
Actuated Green, G (s)	11.4	36.0		10.9	35.5		20.3	30.8	30.8	20.3	30.8	
Effective Green, g (s)	11.4	36.0		10.9	35.5		20.3	30.8	30.8	20.3	30.8	
Actuated g/C Ratio	0.10	0.31		0.09	0.31		0.18	0.27	0.27	0.18	0.27	
Clearance Time (s)	3.5	5.0		3.5	5.0		3.5	5.0	5.0	3.5	5.0	
Vehicle Extension (s)	2.0	3.0		2.0	3.0		2.0	3.0	3.0	2.0	3.0	
Lane Grp Cap (vph)	175	1551		167	1502		312	947	423	312	940	
v/s Ratio Prot	0.08	c0.35		c0.09	0.24		c0.18	0.26		0.18	c0.28	
v/s Ratio Perm									0.10			
v/c Ratio	0.78	1.12		1.01	0.76		1.04	0.99	0.39	1.04	1.04	
Uniform Delay, d1	50.6	39.5		52.0	36.0		47.4	41.9	34.4	47.4	42.1	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	18.7	61.7		71.2	2.4		63.1	26.8	2.7	63.1	39.5	
Delay (s)	69.3	101.2		123.3	38.3		110.5	68.8	37.1	110.5	81.6	
Level of Service	E	F		F	D		F	E	D	F	F	
Approach Delay (s)		98.9			48.7			71.5			88.8	
Approach LOS		F			D			E			F	

Intersection Summary				
HCM 2000 Control Delay	78.5		HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.06			
Actuated Cycle Length (s)	115.0		Sum of lost time (s)	17.0
Intersection Capacity Utilization	100.1%		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)	520	1200	200	220	910	140	390	1120	160	160	980	290
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	5.0		3.5	5.0		3.5	5.0		3.5	5.0	5.0
Lane Util. Factor	0.97	0.91		1.00	0.91		0.97	0.95		1.00	0.95	1.00
Frt	1.00	0.98		1.00	0.98		1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3433	4976		1770	4984		3433	3473		1770	3539	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3433	4976		1770	4984		3433	3473		1770	3539	1583
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)	547	1263	211	232	958	147	411	1179	168	168	1032	305
RTOR Reduction (vph)	0	17	0	0	14	0	0	8	0	0	0	83
Lane Group Flow (vph)	547	1457	0	232	1091	0	411	1339	0	168	1032	222
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	Perm
Protected Phases	7	4		3	8		1	6		5	2	
Permitted Phases												2
Actuated Green, G (s)	23.4	38.0		18.7	33.3		19.1	52.2		14.1	47.2	47.2
Effective Green, g (s)	23.4	38.0		18.7	33.3		19.1	52.2		14.1	47.2	47.2
Actuated g/C Ratio	0.17	0.27		0.13	0.24		0.14	0.37		0.10	0.34	0.34
Clearance Time (s)	3.5	5.0		3.5	5.0		3.5	5.0		3.5	5.0	5.0
Vehicle Extension (s)	2.0	2.5		2.0	2.5		2.0	2.5		2.0	2.5	2.5
Lane Grp Cap (vph)	573	1350		236	1185		468	1294		178	1193	533
v/s Ratio Prot	c0.16	c0.29		0.13	0.22		c0.12	c0.39		c0.09	0.29	
v/s Ratio Perm												0.14
v/c Ratio	0.95	1.08		0.98	0.92		0.88	1.03		0.94	0.87	0.42
Uniform Delay, d1	57.8	51.0		60.5	52.1		59.3	43.9		62.6	43.4	35.8
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	26.3	49.0		53.3	11.6		16.4	34.4		50.5	8.5	2.4
Delay (s)	84.1	100.0		113.8	63.6		75.7	78.3		113.1	51.9	38.2
Level of Service	F	F		F	E		E	E		F	D	D
Approach Delay (s)		95.7			72.3			77.7			56.0	
Approach LOS		F			E			E			E	

Intersection Summary			
HCM 2000 Control Delay	77.2	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.05		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	17.0
Intersection Capacity Utilization	99.8%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	EBR2	WBL2	WBL	WBT	WBR	NBL2	NBL	NBT	NBR
Lane Configurations												
Volume (vph)	10	500	130	30	20	100	360	30	230	370	910	120
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0		4.0		4.0	4.0			4.0	4.0	
Lane Util. Factor		0.91		0.91		1.00	1.00			0.97	0.95	
Frt		0.97		0.85		1.00	0.99			1.00	0.98	
Flt Protected		1.00		1.00		0.95	1.00			0.95	1.00	
Satd. Flow (prot)		3282		1441		1770	1841			3433	3478	
Flt Permitted		1.00		1.00		0.95	1.00			0.95	1.00	
Satd. Flow (perm)		3282		1441		1770	1841			3433	3478	
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)	11	526	137	32	21	105	379	32	242	389	958	126
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	9	0
Lane Group Flow (vph)	0	677	0	29	0	126	411	0	0	631	1075	0
Turn Type	Split	NA		Free	Split	Split	NA		Prot	Prot	NA	
Protected Phases	4	4			8	8	8		5	5	2	
Permitted Phases				Free								
Actuated Green, G (s)		22.0		109.6		24.0	24.0			21.0	32.0	
Effective Green, g (s)		22.0		109.6		24.0	24.0			21.0	32.0	
Actuated g/C Ratio		0.20		1.00		0.22	0.22			0.19	0.29	
Clearance Time (s)		4.0				4.0	4.0			4.0	4.0	
Vehicle Extension (s)		3.0				3.0	3.0			3.0	3.0	
Lane Grp Cap (vph)		658		1441		387	403			657	1015	
v/s Ratio Prot		c0.21				0.07	c0.22			c0.18	c0.31	
v/s Ratio Perm				0.02								
v/c Ratio		1.03		0.02		0.33	1.02			0.96	1.06	
Uniform Delay, d1		43.8		0.0		36.0	42.8			43.9	38.8	
Progression Factor		1.00		1.00		1.00	1.00			1.00	1.00	
Incremental Delay, d2		42.7		0.0		0.5	50.0			25.6	45.2	
Delay (s)		86.5		0.0		36.5	92.8			69.4	84.0	
Level of Service		F		A		D	F			E	F	
Approach Delay (s)		82.9					79.6				78.6	
Approach LOS		F					E				E	

Intersection Summary			
HCM 2000 Control Delay	72.7	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.05		
Actuated Cycle Length (s)	109.6	Sum of lost time (s)	16.0
Intersection Capacity Utilization	96.4%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBL	SBT	SBR	SBR2
Lane Configurations				
Volume (vph)	210	650	410	20
Ideal Flow (vphpl)	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95	1.00	
Frt	1.00	1.00	0.85	
Flt Protected	0.95	1.00	1.00	
Satd. Flow (prot)	1770	3539	1583	
Flt Permitted	0.95	1.00	1.00	
Satd. Flow (perm)	1770	3539	1583	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95
Adj. Flow (vph)	221	684	432	21
RTOR Reduction (vph)	0	0	98	0
Lane Group Flow (vph)	221	684	355	0
Turn Type	Prot	NA	Perm	
Protected Phases	1	6		
Permitted Phases			6	
Actuated Green, G (s)	15.6	26.6	26.6	
Effective Green, g (s)	15.6	26.6	26.6	
Actuated g/C Ratio	0.14	0.24	0.24	
Clearance Time (s)	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	
Lane Grp Cap (vph)	251	858	384	
v/s Ratio Prot	0.12	0.19		
v/s Ratio Perm			0.22	
v/c Ratio	0.88	0.80	0.93	
Uniform Delay, d1	46.1	39.0	40.5	
Progression Factor	1.00	1.00	1.00	
Incremental Delay, d2	28.1	5.2	27.7	
Delay (s)	74.1	44.2	68.3	
Level of Service	E	D	E	
Approach Delay (s)		57.1		
Approach LOS		E		

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	230	370	140	100	310	120	150	1160	80	230	1350	250
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5	5.5	5.5	5.5	5.5	4.0	5.5		4.0	5.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95		1.00	0.95	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99		1.00	0.98	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	1770	3505		1770	3456	
Flt Permitted	0.38	1.00	1.00	0.30	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	712	1863	1583	555	1863	1583	1770	3505		1770	3456	
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)	242	389	147	105	326	126	158	1221	84	242	1421	263
RTOR Reduction (vph)	0	0	71	0	0	45	0	5	0	0	14	0
Lane Group Flow (vph)	242	389	76	105	326	81	158	1300	0	242	1670	0
Turn Type	Perm	NA	Perm	Perm	NA	custom	Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8		6						
Actuated Green, G (s)	34.7	34.7	34.7	34.7	34.7	51.3	9.0	44.3		16.0	51.3	
Effective Green, g (s)	34.7	34.7	34.7	34.7	34.7	51.3	9.0	44.3		16.0	51.3	
Actuated g/C Ratio	0.32	0.32	0.32	0.32	0.32	0.47	0.08	0.40		0.15	0.47	
Clearance Time (s)	5.5	5.5	5.5	5.5	5.5	5.5	4.0	5.5		4.0	5.5	
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0	3.0	2.0		3.0	2.0	
Lane Grp Cap (vph)	224	587	499	175	587	738	144	1411		257	1611	
v/s Ratio Prot		0.21			0.18		0.09	0.37		c0.14	c0.48	
v/s Ratio Perm	c0.34		0.05	0.19		0.05						
v/c Ratio	1.08	0.66	0.15	0.60	0.56	0.11	1.10	0.92		0.94	1.04	
Uniform Delay, d1	37.6	32.6	27.1	31.8	31.2	16.5	50.5	31.2		46.5	29.4	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	83.1	2.2	0.1	3.9	0.6	0.3	103.4	11.3		40.3	32.5	
Delay (s)	120.8	34.8	27.1	35.7	31.9	16.8	153.9	42.5		86.8	61.9	
Level of Service	F	C	C	D	C	B	F	D		F	E	
Approach Delay (s)		60.1			29.2			54.6			65.0	
Approach LOS		E			C			D			E	

Intersection Summary			
HCM 2000 Control Delay	56.7	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.06		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	99.7%	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)	440	1610	190	0	1040	130	100	890	130	240	0	860
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.7	4.9			4.9	4.9	4.0	4.9		4.0		3.7
Lane Util. Factor	0.97	0.95			0.95	1.00	1.00	0.95		1.00		0.88
Frt	1.00	0.98			1.00	0.85	1.00	0.98		1.00		0.85
Flt Protected	0.95	1.00			1.00	1.00	0.95	1.00		0.95		1.00
Satd. Flow (prot)	3433	3483			3539	1583	1770	3471		1770		2787
Flt Permitted	0.95	1.00			1.00	1.00	0.95	1.00		0.95		1.00
Satd. Flow (perm)	3433	3483			3539	1583	1770	3471		1770		2787
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)	463	1695	200	0	1095	137	105	937	137	253	0	905
RTOR Reduction (vph)	0	7	0	0	0	39	0	10	0	0	0	406
Lane Group Flow (vph)	463	1888	0	0	1095	98	105	1064	0	253	0	499
Turn Type	Prot	NA			NA	Perm	Prot	NA		Prot		Over
Protected Phases	5!	2			6!		7	4		1!		5
Permitted Phases						6						
Actuated Green, G (s)	29.3	61.1			45.1	45.1	33.0	32.1		13.0		29.3
Effective Green, g (s)	29.3	61.1			45.1	45.1	33.0	32.1		13.0		29.3
Actuated g/C Ratio	0.24	0.51			0.38	0.38	0.28	0.27		0.11		0.24
Clearance Time (s)	3.7	4.9			4.9	4.9	4.0	4.9		4.0		3.7
Vehicle Extension (s)	2.5	5.0			5.0	5.0	3.0	4.0		3.0		2.5
Lane Grp Cap (vph)	838	1773			1330	594	486	928		191		680
v/s Ratio Prot	0.13	c0.54			0.31		0.06	c0.31		c0.14		0.18
v/s Ratio Perm						0.06						
v/c Ratio	0.55	1.06			0.82	0.17	0.22	1.15		1.32		0.73
Uniform Delay, d1	39.6	29.4			33.8	24.9	33.5	43.9		53.5		41.8
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00		1.00		1.00
Incremental Delay, d2	0.6	41.0			5.9	0.6	0.2	78.9		177.7		3.9
Delay (s)	40.3	70.4			39.7	25.5	33.8	122.8		231.2		45.6
Level of Service	D	E			D	C	C	F		F		D
Approach Delay (s)		64.5			38.1			114.9			86.2	
Approach LOS		E			D			F			F	

Intersection Summary			
HCM 2000 Control Delay	73.3	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.12		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	13.8
Intersection Capacity Utilization	104.1%	ICU Level of Service	G
Analysis Period (min)	15		

! Phase conflict between lane groups.
c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	150	740	240	170	630	210	150	930	140	270	810	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.0		3.0	4.5		3.0	4.5		3.0	4.5	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.96		1.00	0.96		1.00	0.98		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3409		1770	3406		1770	3470		1770	3503	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3409		1770	3406		1770	3470		1770	3503	
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)	158	779	253	179	663	221	158	979	147	284	853	63
RTOR Reduction (vph)	0	21	0	0	22	0	0	8	0	0	4	0
Lane Group Flow (vph)	158	1011	0	179	862	0	158	1118	0	284	912	0
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	16.0	46.0		16.0	45.5		16.0	50.5		23.0	57.5	
Effective Green, g (s)	16.0	46.0		16.0	45.5		16.0	50.5		23.0	57.5	
Actuated g/C Ratio	0.11	0.31		0.11	0.30		0.11	0.34		0.15	0.38	
Clearance Time (s)	3.0	4.0		3.0	4.5		3.0	4.5		3.0	4.5	
Vehicle Extension (s)	1.5	4.5		1.5	4.5		1.5	4.5		1.5	4.5	
Lane Grp Cap (vph)	188	1045		188	1033		188	1168		271	1342	
v/s Ratio Prot	0.09	c0.30		c0.10	0.25		0.09	c0.32		c0.16	0.26	
v/s Ratio Perm												
v/c Ratio	0.84	0.97		0.95	0.83		0.84	0.96		1.05	0.68	
Uniform Delay, d1	65.7	51.3		66.6	48.7		65.7	48.7		63.5	38.6	
Progression Factor	1.00	1.00		1.29	0.41		1.00	1.00		1.00	1.00	
Incremental Delay, d2	26.3	20.4		27.7	2.5		26.3	17.9		67.8	2.8	
Delay (s)	92.0	71.7		113.7	22.5		92.0	66.6		131.3	41.4	
Level of Service	F	E		F	C		F	E		F	D	
Approach Delay (s)		74.4			37.8			69.7			62.6	
Approach LOS		E			D			E			E	

Intersection Summary			
HCM 2000 Control Delay	61.9	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.98		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	96.4%	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)	150	930	100	80	920	190	110	1020	90	140	980	90
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.5		3.0	4.5		3.0	5.0		3.0	5.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.99		1.00	0.97		1.00	0.99		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3488		1770	3448		1770	3496		1770	3494	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3488		1770	3448		1770	3496		1770	3494	
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)	158	979	105	84	968	200	116	1074	95	147	1032	95
RTOR Reduction (vph)	0	5	0	0	11	0	0	5	0	0	4	0
Lane Group Flow (vph)	158	1079	0	84	1157	0	116	1164	0	147	1123	0
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases												
Actuated Green, G (s)	14.8	58.8		8.9	52.9		11.9	52.2		14.6	54.9	
Effective Green, g (s)	14.8	58.8		8.9	52.9		11.9	52.2		14.6	54.9	
Actuated g/C Ratio	0.10	0.39		0.06	0.35		0.08	0.35		0.10	0.37	
Clearance Time (s)	3.0	4.5		3.0	4.5		3.0	5.0		3.0	5.0	
Vehicle Extension (s)	1.5	2.5		1.5	2.5		1.5	2.5		1.5	2.5	
Lane Grp Cap (vph)	174	1367		105	1215		140	1216		172	1278	
v/s Ratio Prot	c0.09	0.31		0.05	c0.34		0.07	c0.33		c0.08	c0.32	
v/s Ratio Perm												
v/c Ratio	0.91	0.79		0.80	0.95		0.83	0.96		0.85	0.88	
Uniform Delay, d1	66.9	40.1		69.7	47.3		68.0	47.8		66.7	44.4	
Progression Factor	1.19	0.45		1.07	0.90		1.00	1.00		1.00	1.00	
Incremental Delay, d2	17.8	1.5		29.3	15.3		30.2	16.5		30.6	7.1	
Delay (s)	97.6	19.4		103.6	57.9		98.2	64.3		97.3	51.5	
Level of Service	F	B		F	E		F	E		F	D	
Approach Delay (s)		29.3			60.9			67.4			56.8	
Approach LOS		C			E			E			E	

Intersection Summary			
HCM 2000 Control Delay	53.8	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	15.5
Intersection Capacity Utilization	93.2%	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)	10	1000	300	270	830	10	330	10	350	10	10	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5		3.5	5.5			4.0	4.0		4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00		1.00	
Frt	1.00	0.97		1.00	1.00			1.00	0.85		0.96	
Flt Protected	0.95	1.00		0.95	1.00			0.95	1.00		0.98	
Satd. Flow (prot)	1770	3417		1770	3533			1777	1583		1750	
Flt Permitted	0.26	1.00		0.95	1.00			0.74	1.00		0.87	
Satd. Flow (perm)	477	3417		1770	3533			1373	1583		1553	
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)	11	1053	316	284	874	11	347	11	368	11	11	11
RTOR Reduction (vph)	0	18	0	0	0	0	0	0	245	0	8	0
Lane Group Flow (vph)	11	1351	0	284	885	0	0	358	123	0	25	0
Turn Type	Perm	NA		Prot	NA		Perm	NA	Perm	Perm	NA	
Protected Phases		6		5	2			4			8	
Permitted Phases	6						4		4	8		
Actuated Green, G (s)	65.3	65.3		27.5	96.3			44.2	44.2		44.2	
Effective Green, g (s)	65.3	65.3		27.5	96.3			44.2	44.2		44.2	
Actuated g/C Ratio	0.44	0.44		0.18	0.64			0.29	0.29		0.29	
Clearance Time (s)	5.5	5.5		3.5	5.5			4.0	4.0		4.0	
Vehicle Extension (s)	4.5	4.5		3.0	4.5			3.0	3.0		3.0	
Lane Grp Cap (vph)	207	1487		324	2268			404	466		457	
v/s Ratio Prot		c0.40		c0.16	0.25							
v/s Ratio Perm	0.02							c0.26	0.08		0.02	
v/c Ratio	0.05	0.91		0.88	0.39			0.89	0.26		0.06	
Uniform Delay, d1	24.5	39.6		59.6	12.8			50.5	40.4		37.9	
Progression Factor	0.35	0.52		0.73	0.69			0.88	1.31		1.00	
Incremental Delay, d2	0.3	7.1		14.4	0.3			18.8	0.3		0.1	
Delay (s)	8.8	27.6		57.7	9.2			63.0	53.4		38.0	
Level of Service	A	C		E	A			E	D		D	
Approach Delay (s)		27.5			21.0			58.1			38.0	
Approach LOS		C			C			E			D	

Intersection Summary			
HCM 2000 Control Delay	32.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	88.9%	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)	640	1140	110	30	1110	170	70	140	60	250	150	400
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	5.5		3.5	5.5			5.0		5.0	5.0	3.5
Lane Util. Factor	0.97	0.95		1.00	0.95			0.95		1.00	1.00	1.00
Frt	1.00	0.99		1.00	0.98			0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.99		0.95	1.00	1.00
Satd. Flow (prot)	3433	3492		1770	3469			3377		1770	1863	1583
Flt Permitted	0.95	1.00		0.95	1.00			0.78		0.51	1.00	1.00
Satd. Flow (perm)	3433	3492		1770	3469			2660		959	1863	1583
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)	674	1200	116	32	1168	179	74	147	63	263	158	421
RTOR Reduction (vph)	0	4	0	0	8	0	0	18	0	0	0	11
Lane Group Flow (vph)	674	1312	0	32	1339	0	0	266	0	263	158	410
Turn Type	Prot	NA		Prot	NA		Perm	NA		Perm	NA	pt+ov
Protected Phases	1	6		5	2			8			4	1 4
Permitted Phases							8			4		
Actuated Green, G (s)	30.5	89.0		3.9	62.4			43.1		43.1	43.1	78.6
Effective Green, g (s)	30.5	89.0		3.9	62.4			43.1		43.1	43.1	73.6
Actuated g/C Ratio	0.20	0.59		0.03	0.42			0.29		0.29	0.29	0.49
Clearance Time (s)	3.5	5.5		3.5	5.5			5.0		5.0	5.0	
Vehicle Extension (s)	2.5	4.5		1.5	4.5			2.5		3.0	3.0	
Lane Grp Cap (vph)	698	2071		46	1443			764		275	535	776
v/s Ratio Prot	c0.20	0.38		0.02	c0.39						0.08	0.26
v/s Ratio Perm								0.10		c0.27		
v/c Ratio	0.97	0.63		0.70	0.93			0.35		0.96	0.30	0.53
Uniform Delay, d1	59.2	19.9		72.5	41.7			42.3		52.5	41.6	26.3
Progression Factor	0.98	0.65		1.00	1.00			1.00		1.00	1.00	1.00
Incremental Delay, d2	22.7	1.2		30.8	11.8			0.2		42.0	0.3	0.5
Delay (s)	80.9	14.2		103.3	53.4			42.5		94.6	41.9	26.8
Level of Service	F	B		F	D			D		F	D	C
Approach Delay (s)		36.8			54.6			42.5			50.8	
Approach LOS		D			D			D			D	

Intersection Summary			
HCM 2000 Control Delay	45.2	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.94		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	92.3%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	500	580	750	370	140	940
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.85	0.96		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1770	1583	1780		1770	1863
Flt Permitted	0.95	1.00	1.00		0.11	1.00
Satd. Flow (perm)	1770	1583	1780		207	1863
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	526	611	789	389	147	989
RTOR Reduction (vph)	0	143	30	0	0	0
Lane Group Flow (vph)	526	468	1148	0	147	989
Turn Type	NA	Perm	NA		Perm	NA
Protected Phases	8		2			6
Permitted Phases		8			6	
Actuated Green, G (s)	16.0	16.0	36.0		36.0	36.0
Effective Green, g (s)	16.0	16.0	36.0		36.0	36.0
Actuated g/C Ratio	0.27	0.27	0.60		0.60	0.60
Clearance Time (s)	4.0	4.0	4.0		4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	472	422	1068		124	1117
v/s Ratio Prot	c0.30		0.65			0.53
v/s Ratio Perm		0.30			c0.71	
v/c Ratio	1.11	1.11	1.08		1.19	0.89
Uniform Delay, d1	22.0	22.0	12.0		12.0	10.2
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	76.5	76.8	50.1		139.1	8.6
Delay (s)	98.5	98.8	62.1		151.1	18.9
Level of Service	F	F	E		F	B
Approach Delay (s)	98.6		62.1			36.0
Approach LOS	F		E			D

Intersection Summary			
HCM 2000 Control Delay	65.6	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.16		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	107.5%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	30	1120	80	30	520	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		0.95	1.00	
Frt	1.00	0.85		1.00	1.00	
Flt Protected	1.00	1.00		0.97	0.95	
Satd. Flow (prot)	1863	1583		3416	1768	
Flt Permitted	1.00	1.00		0.80	0.95	
Satd. Flow (perm)	1863	1583		2832	1768	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	32	1179	84	32	547	21
RTOR Reduction (vph)	0	661	0	0	4	0
Lane Group Flow (vph)	32	518	0	116	564	0
Turn Type	NA	Perm	Perm	NA	NA	
Protected Phases	4			8	2	
Permitted Phases		4	8			
Actuated Green, G (s)	15.6	15.6		15.6	16.0	
Effective Green, g (s)	15.6	15.6		15.6	16.0	
Actuated g/C Ratio	0.39	0.39		0.39	0.40	
Clearance Time (s)	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	733	623		1115	714	
v/s Ratio Prot	0.02				c0.32	
v/s Ratio Perm		c0.33		0.04		
v/c Ratio	0.04	0.83		0.10	0.79	
Uniform Delay, d1	7.4	10.8		7.6	10.3	
Progression Factor	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.0	9.2		0.0	8.7	
Delay (s)	7.4	20.0		7.6	19.0	
Level of Service	A	C		A	B	
Approach Delay (s)	19.7			7.6	19.0	
Approach LOS	B			A	B	

Intersection Summary			
HCM 2000 Control Delay	18.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	39.6	Sum of lost time (s)	8.0
Intersection Capacity Utilization	80.4%	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)	70	740	50	60	660	90	60	650	30	80	820	90
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0		4.0	5.0		4.0	5.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.99		1.00	0.98		1.00	0.99		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3505		1770	3475		1770	3515		1770	3487	
Flt Permitted	0.21	1.00		0.19	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	396	3505		353	3475		1770	3515		1770	3487	
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)	74	779	53	63	695	95	63	684	32	84	863	95
RTOR Reduction (vph)	0	7	0	0	15	0	0	4	0	0	10	0
Lane Group Flow (vph)	74	825	0	63	775	0	63	712	0	84	948	0
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)	25.1	25.1		25.1	25.1		3.9	31.2		4.7	32.0	
Effective Green, g (s)	25.1	25.1		25.1	25.1		3.9	31.2		4.7	32.0	
Actuated g/C Ratio	0.33	0.33		0.33	0.33		0.05	0.42		0.06	0.43	
Clearance Time (s)	5.0	5.0		5.0	5.0		4.0	5.0		4.0	5.0	
Vehicle Extension (s)	3.5	3.5		3.5	3.5		2.0	4.0		2.0	4.0	
Lane Grp Cap (vph)	132	1173		118	1162		92	1462		110	1487	
v/s Ratio Prot		c0.24			0.22		0.04	0.20		c0.05	c0.27	
v/s Ratio Perm	0.19			0.18								
v/c Ratio	0.56	0.70		0.53	0.67		0.68	0.49		0.76	0.64	
Uniform Delay, d1	20.4	21.7		20.2	21.4		34.9	16.0		34.6	16.9	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	5.8	2.0		5.2	1.5		15.5	1.2		24.1	2.1	
Delay (s)	26.2	23.7		25.4	22.9		50.4	17.2		58.7	19.0	
Level of Service	C	C		C	C		D	B		E	B	
Approach Delay (s)		23.9			23.1			19.9			22.2	
Approach LOS		C			C			B			C	

Intersection Summary			
HCM 2000 Control Delay	22.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	71.7%	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)	180	760	200	160	580	90	150	900	140	100	870	120
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	5.0		3.0	5.0		3.0	5.0		3.0	5.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.97		1.00	0.98		1.00	0.98		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3428		1770	3468		1770	3468		1770	3475	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	3428		1770	3468		1770	3468		1770	3475	
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)	189	800	211	168	611	95	158	947	147	105	916	126
RTOR Reduction (vph)	0	29	0	0	15	0	0	15	0	0	13	0
Lane Group Flow (vph)	189	982	0	168	691	0	158	1079	0	105	1029	0
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												
Actuated Green, G (s)	9.7	24.0		8.0	22.3		8.0	27.0		5.0	24.0	
Effective Green, g (s)	9.7	24.0		8.0	22.3		8.0	27.0		5.0	24.0	
Actuated g/C Ratio	0.12	0.30		0.10	0.28		0.10	0.34		0.06	0.30	
Clearance Time (s)	3.0	5.0		3.0	5.0		3.0	5.0		3.0	5.0	
Vehicle Extension (s)	1.5	4.0		1.5	4.0		1.5	4.0		1.5	4.0	
Lane Grp Cap (vph)	214	1028		177	966		177	1170		110	1042	
v/s Ratio Prot	0.11	c0.29		c0.09	0.20		0.09	c0.31		0.06	c0.30	
v/s Ratio Perm												
v/c Ratio	0.88	0.95		0.95	0.72		0.89	0.92		0.95	0.99	
Uniform Delay, d1	34.6	27.5		35.8	26.0		35.6	25.5		37.4	27.8	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	31.3	19.1		51.8	4.5		38.0	12.0		70.4	24.6	
Delay (s)	65.9	46.6		87.6	30.5		73.5	37.5		107.8	52.4	
Level of Service	E	D		F	C		E	D		F	D	
Approach Delay (s)		49.6			41.5			42.1			57.5	
Approach LOS		D			D			D			E	

Intersection Summary			
HCM 2000 Control Delay	47.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.97		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	87.4%	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)	160	970	70	70	660	100	40	750	60	130	950	90
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.99		1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	3503		1770	3470		1770	1863	1583	1770	1863	1583
Flt Permitted	0.22	1.00		0.14	1.00		0.10	1.00	1.00	0.14	1.00	1.00
Satd. Flow (perm)	414	3503		257	3470		182	1863	1583	260	1863	1583
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)	168	1021	74	74	695	105	42	789	63	137	1000	95
RTOR Reduction (vph)	0	6	0	0	15	0	0	0	13	0	0	41
Lane Group Flow (vph)	168	1089	0	74	785	0	42	789	50	137	1000	54
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		6
Actuated Green, G (s)	29.0	29.0		29.0	29.0		41.0	41.0	41.0	41.0	41.0	41.0
Effective Green, g (s)	29.0	29.0		29.0	29.0		41.0	41.0	41.0	41.0	41.0	41.0
Actuated g/C Ratio	0.36	0.36		0.36	0.36		0.51	0.51	0.51	0.51	0.51	0.51
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		4.0	4.0	4.0	3.0	3.0	3.0
Lane Grp Cap (vph)	150	1269		93	1257		93	954	811	133	954	811
v/s Ratio Prot		0.31			0.23			0.42			c0.54	
v/s Ratio Perm	c0.41			0.29			0.23		0.03	0.53		0.03
v/c Ratio	1.12	0.86		0.80	0.62		0.45	0.83	0.06	1.03	1.05	0.07
Uniform Delay, d1	25.5	23.6		22.8	21.0		12.4	16.5	9.8	19.5	19.5	9.8
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	109.3	6.0		36.1	1.0		15.0	8.2	0.1	86.3	42.6	0.2
Delay (s)	134.8	29.5		58.9	22.0		27.4	24.7	10.0	105.8	62.1	10.0
Level of Service	F	C		E	C		C	C	A	F	E	A
Approach Delay (s)		43.5			25.1			23.8			62.9	
Approach LOS		D			C			C			E	

Intersection Summary			
HCM 2000 Control Delay	41.2	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.08		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	108.2%	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)	50	820	100	90	580	210	110	400	220	60	460	80
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0		4.5	4.5		4.5	4.5	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frt	1.00	0.98		1.00	0.96		1.00	0.95		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3482		1770	3398		1770	3351		1770	3461	
Flt Permitted	0.30	1.00		0.25	1.00		0.31	1.00		0.25	1.00	
Satd. Flow (perm)	559	3482		460	3398		583	3351		468	3461	
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)	53	863	105	95	611	221	116	421	232	63	484	84
RTOR Reduction (vph)	0	11	0	0	42	0	0	87	0	0	21	0
Lane Group Flow (vph)	53	957	0	95	790	0	116	566	0	63	547	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Actuated Green, G (s)	44.0	44.0		44.0	44.0		21.5	21.5		21.5	21.5	
Effective Green, g (s)	44.0	44.0		44.0	44.0		21.5	21.5		21.5	21.5	
Actuated g/C Ratio	0.59	0.59		0.59	0.59		0.29	0.29		0.29	0.29	
Clearance Time (s)	5.0	5.0		5.0	5.0		4.5	4.5		4.5	4.5	
Vehicle Extension (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Grp Cap (vph)	327	2042		269	1993		167	960		134	992	
v/s Ratio Prot		c0.27			0.23			0.17			0.16	
v/s Ratio Perm	0.09			0.21			c0.20			0.13		
v/c Ratio	0.16	0.47		0.35	0.40		0.69	0.59		0.47	0.55	
Uniform Delay, d1	7.1	8.8		8.1	8.3		23.8	23.0		22.1	22.7	
Progression Factor	1.00	1.00		0.54	0.51		1.00	1.00		0.86	0.82	
Incremental Delay, d2	1.1	0.8		3.3	0.5		12.7	1.1		1.8	0.4	
Delay (s)	8.1	9.6		7.7	4.8		36.5	24.1		20.8	18.9	
Level of Service	A	A		A	A		D	C		C	B	
Approach Delay (s)		9.5			5.1			25.9			19.1	
Approach LOS		A			A			C			B	

Intersection Summary			
HCM 2000 Control Delay	13.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	9.5
Intersection Capacity Utilization	71.5%	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)	160	980	60	70	700	160	30	390	80	160	260	140
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5		5.5	5.5		4.5	4.5		4.5	4.5	4.5
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.99		1.00	0.97		1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3509		1770	3441		1770	1815		1770	1863	1583
Flt Permitted	0.25	1.00		0.18	1.00		0.50	1.00		0.24	1.00	1.00
Satd. Flow (perm)	465	3509		332	3441		934	1815		445	1863	1583
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)	168	1032	63	74	737	168	32	411	84	168	274	147
RTOR Reduction (vph)	0	5	0	0	25	0	0	10	0	0	0	89
Lane Group Flow (vph)	168	1090	0	74	880	0	32	485	0	168	274	58
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		2			2			4			4	
Permitted Phases	2			2			4			4		4
Actuated Green, G (s)	37.9	37.9		37.9	37.9		27.1	27.1		27.1	27.1	27.1
Effective Green, g (s)	37.9	37.9		37.9	37.9		27.1	27.1		27.1	27.1	27.1
Actuated g/C Ratio	0.51	0.51		0.51	0.51		0.36	0.36		0.36	0.36	0.36
Clearance Time (s)	5.5	5.5		5.5	5.5		4.5	4.5		4.5	4.5	4.5
Vehicle Extension (s)	4.0	4.0		4.0	4.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	234	1773		167	1738		337	655		160	673	571
v/s Ratio Prot		0.31			0.26			0.27			0.15	
v/s Ratio Perm	c0.36			0.22			0.03			c0.38		0.04
v/c Ratio	0.72	0.61		0.44	0.51		0.09	0.74		1.05	0.41	0.10
Uniform Delay, d1	14.4	13.3		11.8	12.3		15.8	20.9		24.0	17.9	15.9
Progression Factor	0.73	0.70		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	15.9	1.5		8.3	1.1		0.1	4.5		85.0	0.4	0.1
Delay (s)	26.4	10.7		20.1	13.4		16.0	25.4		109.0	18.3	16.0
Level of Service	C	B		C	B		B	C		F	B	B
Approach Delay (s)		12.8			13.9			24.8			43.6	
Approach LOS		B			B			C			D	

Intersection Summary			
HCM 2000 Control Delay	20.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	88.2%	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)	420	1170	770	220	1510	380	700	240	410	240	470	180
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	5.5	3.0	3.0	5.5	5.0	3.0	5.0	3.0	5.0	5.0	3.0
Lane Util. Factor	0.97	0.91	0.88	1.00	0.91	1.00	0.97	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	5085	2787	1770	5085	1583	3433	1863	1583	1770	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	5085	2787	1770	5085	1583	3433	1863	1583	1770	1863	1583
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)	442	1232	811	232	1589	400	737	253	432	253	495	189
RTOR Reduction (vph)	0	0	99	0	0	112	0	0	77	0	0	25
Lane Group Flow (vph)	442	1232	712	232	1589	288	737	253	355	253	495	164
Turn Type	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	1	6	7	5	2	3	7	4	5	3	8	1
Permitted Phases			6			2			4			8
Actuated Green, G (s)	16.6	36.5	68.4	19.6	39.5	65.5	31.9	44.4	64.0	26.0	40.5	57.1
Effective Green, g (s)	16.6	36.5	68.4	19.6	39.5	65.5	31.9	44.4	64.0	26.0	40.5	57.1
Actuated g/C Ratio	0.11	0.25	0.47	0.14	0.27	0.45	0.22	0.31	0.44	0.18	0.28	0.39
Clearance Time (s)	3.0	5.5	3.0	3.0	5.5	5.0	3.0	5.0	3.0	5.0	5.0	3.0
Vehicle Extension (s)	1.5	4.5	1.5	1.5	4.5	2.5	1.5	2.5	1.5	2.5	2.5	1.5
Lane Grp Cap (vph)	393	1280	1314	239	1385	715	755	570	698	317	520	623
v/s Ratio Prot	c0.13	0.24	0.12	0.13	c0.31	0.07	c0.21	0.14	0.07	0.14	c0.27	0.03
v/s Ratio Perm			0.14			0.11			0.16			0.07
v/c Ratio	1.12	0.96	0.54	0.97	1.15	0.40	0.98	0.44	0.51	0.80	0.95	0.26
Uniform Delay, d1	64.2	53.6	27.2	62.4	52.8	26.6	56.2	40.4	29.2	57.0	51.3	29.7
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	83.8	17.6	0.2	49.6	75.2	0.3	26.6	0.4	0.2	12.7	27.7	0.1
Delay (s)	148.0	71.2	27.4	112.0	128.0	26.9	82.7	40.8	29.4	69.7	79.0	29.8
Level of Service	F	E	C	F	F	C	F	D	C	E	E	C
Approach Delay (s)		70.6			108.1			59.1			66.5	
Approach LOS		E			F			E			E	

Intersection Summary			
HCM 2000 Control Delay	79.5	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.06		
Actuated Cycle Length (s)	145.0	Sum of lost time (s)	18.5
Intersection Capacity Utilization	101.3%	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)	680	1260	310	30	650	580	350	320	70	470	250	920
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	6.0		3.0	6.0	3.0	3.0	6.0		3.0	6.0	3.0
Lane Util. Factor	0.97	0.95		1.00	0.91	1.00	0.97	0.95		0.97	0.95	1.00
Frt	1.00	0.97		1.00	1.00	0.85	1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3433	3434		1770	5085	1583	3433	3444		3433	3539	1583
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3433	3434		1770	5085	1583	3433	3444		3433	3539	1583
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)	716	1326	326	32	684	611	368	337	74	495	263	968
RTOR Reduction (vph)	0	18	0	0	0	54	0	16	0	0	0	27
Lane Group Flow (vph)	716	1634	0	32	684	557	368	395	0	495	263	941
Turn Type	Prot	NA		Prot	NA	pm+ov	Prot	NA		Prot	NA	pm+ov
Protected Phases	1	6		5	2	7	3	8		7	4	1
Permitted Phases						2						4
Actuated Green, G (s)	38.8	59.8		3.0	24.0	42.4	12.0	15.8		18.4	22.2	61.0
Effective Green, g (s)	38.8	59.8		3.0	24.0	42.4	12.0	15.8		18.4	22.2	61.0
Actuated g/C Ratio	0.34	0.52		0.03	0.21	0.37	0.10	0.14		0.16	0.19	0.53
Clearance Time (s)	3.0	6.0		3.0	6.0	3.0	3.0	6.0		3.0	6.0	3.0
Vehicle Extension (s)	1.5	4.0		1.5	4.0	1.5	1.5	4.0		1.5	4.0	1.5
Lane Grp Cap (vph)	1158	1785		46	1061	583	358	473		549	683	839
v/s Ratio Prot	0.21	c0.48		0.02	0.13	c0.15	c0.11	0.11		0.14	0.07	c0.38
v/s Ratio Perm						0.20						0.22
v/c Ratio	0.62	0.92		0.70	0.64	0.96	1.03	0.83		0.90	0.39	1.12
Uniform Delay, d1	31.9	25.3		55.5	41.6	35.4	51.5	48.3		47.4	40.4	27.0
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.7	8.9		30.8	3.0	26.2	54.9	12.5		17.6	0.5	70.3
Delay (s)	32.6	34.2		86.4	44.6	61.6	106.4	60.8		65.0	40.9	97.3
Level of Service	C	C		F	D	E	F	E		E	D	F
Approach Delay (s)		33.7			53.5			82.4			79.4	
Approach LOS		C			D			F			E	

Intersection Summary			
HCM 2000 Control Delay	56.8	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.10		
Actuated Cycle Length (s)	115.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	91.2%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	480	400	880	540	540	700
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.88	0.95	1.00	1.00	0.95
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	3433	2787	3539	1583	1770	3539
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	3433	2787	3539	1583	1770	3539
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	505	421	926	568	568	737
RTOR Reduction (vph)	0	357	0	269	0	0
Lane Group Flow (vph)	505	64	926	299	568	737
Turn Type	NA	Prot	NA	Perm	Prot	NA
Protected Phases	8	8	2		1	6
Permitted Phases				2		
Actuated Green, G (s)	22.0	22.0	52.2	52.2	50.4	106.6
Effective Green, g (s)	22.0	22.0	52.2	52.2	50.4	106.6
Actuated g/C Ratio	0.15	0.15	0.36	0.36	0.35	0.74
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	520	422	1274	569	615	2601
v/s Ratio Prot	c0.15	0.02	c0.26		c0.32	0.21
v/s Ratio Perm				0.19		
v/c Ratio	0.97	0.15	0.73	0.53	0.92	0.28
Uniform Delay, d1	61.2	53.4	40.2	36.6	45.4	6.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	32.0	0.2	3.7	3.5	19.6	0.3
Delay (s)	93.2	53.6	43.9	40.1	65.1	6.7
Level of Service	F	D	D	D	E	A
Approach Delay (s)	75.2		42.4			32.1
Approach LOS	E		D			C

Intersection Summary			
HCM 2000 Control Delay	47.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	145.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	77.9%	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)	150	670	290	90	500	160	310	1030	120	130	1150	190
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	3.0	5.5		3.0	5.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95		1.00	0.95	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98		1.00	0.98	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	1770	3484		1770	3464	
Flt Permitted	0.18	1.00	1.00	0.15	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	328	1863	1583	287	1863	1583	1770	3484		1770	3464	
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)	158	705	305	95	526	168	326	1084	126	137	1211	200
RTOR Reduction (vph)	0	0	131	0	0	110	0	12	0	0	18	0
Lane Group Flow (vph)	158	705	174	95	526	58	326	1198	0	137	1393	0
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Prot	NA		Prot	NA	
Protected Phases		6			2		7	4		3	8	
Permitted Phases	6		6	2		2						
Actuated Green, G (s)	26.0	26.0	26.0	26.0	26.0	26.0	8.0	30.5		6.0	28.5	
Effective Green, g (s)	26.0	26.0	26.0	26.0	26.0	26.0	8.0	30.5		6.0	28.5	
Actuated g/C Ratio	0.35	0.35	0.35	0.35	0.35	0.35	0.11	0.41		0.08	0.38	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	3.0	5.5		3.0	5.5	
Vehicle Extension (s)	2.5	2.5	2.5	2.5	2.5	2.5	1.0	4.5		1.0	4.5	
Lane Grp Cap (vph)	113	645	548	99	645	548	188	1416		141	1316	
v/s Ratio Prot		0.38			0.28		c0.18	0.34		0.08	c0.40	
v/s Ratio Perm	c0.48		0.11	0.33		0.04						
v/c Ratio	1.40	1.09	0.32	0.96	0.82	0.11	1.73	0.85		0.97	1.06	
Uniform Delay, d1	24.5	24.5	18.0	24.0	22.3	16.6	33.5	20.1		34.4	23.2	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	224.0	63.5	0.2	76.4	7.7	0.1	351.6	6.4		66.6	41.9	
Delay (s)	248.5	88.0	18.2	100.4	30.0	16.7	385.1	26.5		101.0	65.1	
Level of Service	F	F	B	F	C	B	F	C		F	E	
Approach Delay (s)		91.5			35.6			102.6			68.3	
Approach LOS		F			D			F			E	

Intersection Summary			
HCM 2000 Control Delay	79.0	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.24		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	12.5
Intersection Capacity Utilization	109.9%	ICU Level of Service	H
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)	200	380	220	110	450	50	250	1010	90	40	1010	210
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	3.5	4.5	4.5	3.5	4.5	4.5
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.91	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	1770	3539	1583	1770	5085	1583
Flt Permitted	0.29	1.00	1.00	0.37	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	543	1863	1583	690	1863	1583	1770	3539	1583	1770	5085	1583
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)	211	400	232	116	474	53	263	1063	95	42	1063	221
RTOR Reduction (vph)	0	0	141	0	0	32	0	0	57	0	0	144
Lane Group Flow (vph)	211	400	91	116	474	21	263	1063	38	42	1063	77
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases		2			6		7	4		3	8	
Permitted Phases	2		2	6		6			4			8
Actuated Green, G (s)	27.5	27.5	27.5	27.5	27.5	27.5	10.5	27.8	27.8	2.7	20.0	20.0
Effective Green, g (s)	27.5	27.5	27.5	27.5	27.5	27.5	10.5	27.8	27.8	2.7	20.0	20.0
Actuated g/C Ratio	0.39	0.39	0.39	0.39	0.39	0.39	0.15	0.40	0.40	0.04	0.29	0.29
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	3.5	4.5	4.5	3.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	2.0	2.5	2.5	2.0	2.5	2.5
Lane Grp Cap (vph)	213	731	621	271	731	621	265	1405	628	68	1452	452
v/s Ratio Prot		0.21			0.25		c0.15	c0.30		0.02	0.21	
v/s Ratio Perm	c0.39		0.06	0.17		0.01			0.02			0.05
v/c Ratio	0.99	0.55	0.15	0.43	0.65	0.03	0.99	0.76	0.06	0.62	0.73	0.17
Uniform Delay, d1	21.1	16.4	13.7	15.5	17.3	13.1	29.7	18.2	13.0	33.1	22.6	18.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	59.3	2.9	0.5	1.1	2.0	0.0	52.9	2.3	0.0	11.2	1.8	0.1
Delay (s)	80.4	19.4	14.2	16.6	19.3	13.1	82.6	20.4	13.1	44.3	24.4	18.9
Level of Service	F	B	B	B	B	B	F	C	B	D	C	B
Approach Delay (s)		33.2			18.3			31.5			24.1	
Approach LOS		C			B			C			C	

Intersection Summary			
HCM 2000 Control Delay	27.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.94		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	81.9%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

APPENDIX E: TRAVEL DEMAND FORECASTING INFORMATION

FEHR PEERS

MEMORANDUM

Date: March 9, 2013

To: Pomona Model Users

From: Jason D. Pack, P.E.
Rafael Cobian, P.E.

Subject: City of Pomona Traffic Analysis Model (PTAM) Development Memo

Ref OC12-0206

The purpose of this memo is to describe the Travel Demand Forecasting (TDF) model built for the City of Pomona General Plan and Corridors Specific Plan EIR. This memo summarizes the model development process in general, and how this process was applied to develop the City of Pomona Traffic Analysis Model (PTAM).

The remainder of this memo provides a description of the model study area followed by a summary of the data collection (including the sources of data used to develop key model inputs) and model calibration effort. A summary of how well the model performed against validation thresholds established by the California Transportation Commission is then provided followed by a discussion of the future year model development process.

GENERAL DISCUSSION OF THE TDF MODEL

A TDF model is a computer program that simulates traffic levels and travel patterns for a specific geographic area. The program consists of input files that summarize the area's land uses, street network, travel characteristics, and other key factors. Using this data, the model performs a series of calculations to determine the amount of trips generated, the beginning and ending location of each trip, and the route taken by the trip. The model's output includes projections of traffic volumes on major roads, turning movements at certain key intersections, and estimates of vehicle miles traveled.

The travel model was used to estimate the average peak hour (weekday and weekend) traffic volumes and vehicle miles traveled on the major roadways in and around the City of Pomona in response to future land use, transportation infrastructure, and policy assumptions; and forms a consistent basis by which to analyze the potential development scenarios and changes in the transportation network.

To be deemed accurate for projecting traffic volumes in the future, a model must first be calibrated to a year in which actual land use data and traffic volumes are available and are well documented. A model is accurately calibrated when it replicates the actual traffic counts on the major roads within certain ranges of error established in *2010 California Regional Transportation Plan Guidelines* (California Transportation Commission, January, 2011).

Model Study Area

The study area for PTAM is roughly bounded by the Mountain Range to the north, Chino Avenue to the south, Grand Avenue to the west, and Monte Vista Avenue to the east. The study area contains all major roadways in and around the City of Pomona and extends just beyond the City limits to capture the influences of adjacent land uses and roadway network to the City.

Data Collection

A data collection effort was undertaken at the outset of the PTAM development process. Data sources include the SCAG Regional Travel Demand Forecasting Model used for the 2012 RTP/SCS update for street network and regional travel data, Caltrans and the City of Pomona for traffic count data, and Census data for land use information. Traffic counts were also collected as part of the environmental review process.

Land Use Data

Land use data is one of the primary inputs to PTAM, and this data is instrumental in estimating trip generation. The model's primary source of land use data is the SCAG land use data set. However, the base year land use data was updated based on school locations and enrollment data from school websites, LEHD and other Census-based data information, and information developed as part of the General Plan and Corridors Specific Plan efforts.

Land use in the model is divided into a variety of residential and non-residential categories. PTAM employs 17 land use data categories to describe land use in the model, as shown in Table 1.

Traffic Analysis Zone System

Travel demand models use traffic analysis zones (TAZs) to subdivide the study area for the purpose of connecting land uses to the street network. TAZs represent physical areas containing land uses that produce or attract vehicle-trip ends. The TAZ system for PTAM was developed based on SCAG's TAZ system, but each area of the City had detail added to represent more accurate loading of traffic to the roadway network.

The resulting model TAZ system includes 310 zones in the model study area that are currently used, with an additional 40 zones that are "spare" and can be used to add model detail for future application.

Also included in the TAZ structure are the external stations or gateways at points where major roadways provide access into the model study area. The external gateways represent all major routes by which traffic can enter or exit the model study area and capture the traffic entering, exiting, or passing through the model study area. A total of 77 external gateways were established for this model.

TABLE 1MODEL LAND USE CATEGORIES		
Land Use Category	Units	Weekday Daily Trip Rate
Single Family Dwelling Unit	Dwelling Units	8.13
Multi-Family Dwelling Unit	Dwelling Units	5.63
Agricultural Employee	Employees	0.70
Construction Employee	Employees	2.19
Manufacturing Employee	Employees	1.69
Wholesale Employee	Employees	3.31
Retail Employee	Employees	18.71
Transportation Employee	Employees	3.31
Information Services Employee	Employees	2.35
Financial Real Estate Employee	Employees	2.64
Professional Employee	Employees	2.71
Arts/Entertainment Employee	Employees	15.30
Other Services Employee	Employees	18.70
Public Administration Employee	Employees	8.37
K-12	Students	1.31
Commuter College	Students	1.02
Residential College	Students	1.02

Street Network

The street network for the base year conditions is derived from the base year (2008) SCAG model that was developed for the 2012 RTP/SCS. The street network includes information such as street name, length, functional class, speed, capacity, and number of lanes. These attributes were checked using maps, aerial photographs, and reviewed by City staff. The model street network includes all freeways, arterials, majors, secondaries, and collectors within the model study area. Local streets are also included or are represented by centroid connectors which determine how trips originating or terminating at TAZs access the collectors, arterials, etc. included in the street network.

Please note that, since the network is tiered off of the 2012 RTP model, any scenario modifications needs to be initiated using TransCAD Version 6.0 (Build 6010). Otherwise, all other functions of the model must be run in TransCAD Version 5.0 R4 (Build 2025).

Model Calibration

Model calibration is the process by which parameters for the model are determined. These parameters are based on comparing travel estimates computed by the model with actual data from the area being modeled. This section provides a general description of the calibration steps and the adjustments made during the process to achieve accuracy levels that are within California Transportation Commission guidelines.

Trip Generation Rates

Trip generation rates relate the number of vehicle trips going to and from a site to some measure of the intensity of use at the site. Each trip has two ends, a “production” and an “attraction”. By convention, trips with one end at a residence are defined as being “produced” by the residence and “attracted” to the other use (workplace, school, retail store, etc.), and are called “Home-Based” trips. Trips that do not have one end at a residence are called “Non-Home-Based” trips.

There are six trip purposes used in PTAM:

1. Home-Based Work (HBW): trips between a residence and a workplace.
2. Home-Based Other (HBO): trips between a residence and any other destination.
3. Non-Home-Based (NHB): trips that do not begin or end at a residence, such as traveling from a workplace to a restaurant, or from a retail store to a bank.
4. School (SCHOOL): trips to and from a school.
5. College/University Commuter (COLL_COM): trips to and from a college/university with high commuter population.
6. College/University Residential (COLL_RES): trips to and from a college/university with high residential population.

Trip generation rates are initially defined for total trips and later split by trip purpose, for both productions and attractions.

The most widely used source for individual project vehicle trip generation rates in the transportation planning field is *Trip Generation, 9th Edition* (Institute of transportation Engineers [ITE], 2012). This book contains national averages of trip generation rates for a variety of land uses in what are generally suburban locations. While these trip rates are a valid starting point for model calibration and validation, they have a different purpose and are not necessarily suitable for demand forecasting without customization since models generate trips by purpose, and balances model-wide productions to attractions.

Therefore, the trip generation rates were initially based on the SCAG regional model, the San Diego Association of Governments’ (SANDAG) trip generation survey, recently calibrated models in similar areas, and *Trip Generation, 9th Edition*. The rates were then modified to account for local conditions based on counts, production-to-attraction balancing (discussed below), and the difference between ITE and model land use definitions. The final PTAM trip generation rates are unique to PTAM and they are ultimately based upon the results of successful model calibration and validation. The final model peak weekday vehicle trip generation rates per unit are shown in Table 1.

Production/Attraction Balancing

Local trips (internal-to-internal, or I-I) are trips that both start and end in the model study area. External trips (internal-to-external, or I-X, or external-to-internal, or X-I) are trips that either start or end in the model study area but not both. One of the basic assumptions of any travel model is that the total number of local trips produced is equal to the total number of local trips attracted. However, it is also assumed that not every trip is satisfied within the model study area due to land use imbalances and personal preference of where to live, work, and shop. A certain percentage of internal productions and attractions are therefore assumed to be satisfied by land uses outside the model study area while the remaining are assumed to be satisfied by land uses inside the model study area.

The I-X and X-I percentages for each of the seven trip purposes were estimated based on a subarea analysis of the base year SCAG 2012 RTP/SCS model. I-I trip productions and attractions were then balanced where appropriate to match internal productions to internal attractions. If the total internal productions and attractions are not equal, the model will typically adjust the attractions to match the productions, thus ensuring that each departing traveler finds a destination. While it is never possible to achieve a perfect match between productions and attractions prior to the automatic balancing procedure, the existence of a substantial mismatch in one or more trip purposes may indicate that either land use inputs or trip generation factors may be in error.

This information, in conjunction with trip generation rate comparisons and trip purpose distributions discussed later in this memo, indicates that the trip generation component of PTAM is performing reasonably.

Trip Distribution (Gravity Model)

Once the trip generation step has determined the number of trips that begin and end in each zone, the trip distribution process determines the specific destination of each originating trip. The destination may be within the zone itself, resulting in an intra-zonal trip. If the destination is outside of the zone of origin, it is an inter-zonal trip. The trip distribution model uses a gravity model equation to distribute trips to all zones. This equation estimates an accessibility index for each zone based on the number of attractions in each zone and a friction factor, which is a function of travel time between zones. Each attraction zone is given its share of productions based on its share of the accessibility index. This process applies to the I-I, I-X, and X-I trips.

Friction Factors

Friction factors, also known as travel time factors, determine the relative attractiveness of each destination zone based on the travel time between TAZs and the number of potential origins and destinations in each TAZ. These factors are used in the trip distribution stage of the model. The model friction factors are based on data reported in national modeling reference documents such as National Cooperative Highway Research Program (NCHRP) 365, and modified based on local conditions and comparison with the SCAG model.

Trips between the Model Area and External Areas

One of the important inputs to a travel model is an estimate of the amount of travel between the study area and neighboring areas outside the model. The proportion of HBW, HBO, and NHB trips entering and leaving the model study area was estimated based on a subarea analysis of the base year (2008) SCAG model as described above.

After the number of I-X/X-I trips was estimated, these trips were distributed to the stations around the perimeter of the model area using external station weights. External station weights were based on weekday and weekend traffic counts at each external station. The number of through trips at each station was subtracted from the count and the remainder was made up of I-X/X-I trips.

Through Trips

Through trips (also called external-external, or X-X trips) are those that pass through the model study area without stopping inside the model study area. The major flows of through traffic in the PTAM area use the highway and freeway systems (I-10, SR-60, and SR-71), with lower volumes of through traffic using other streets. The size of these flows was estimated based on Caltrans traffic counts and the subarea analysis of the base year (2008) SCAG Model The through trips were modified in conjunction with the external station weights so that results at the model gateways accurately represented observed data.

Trip Assignment

The trip assignment process determines the route that each vehicle trip takes from origin to destination. The model selects these routes in a manner that is sensitive to congestion and the desire of drivers to minimize overall travel time. It uses an iterative, capacity-restrained assignment, and volume adjustments are made that progress towards equilibrium. This technique finds a travel path for each trip that minimizes travel time, while taking into account congestion delays caused by other trips in the model.

The general assignment process includes the following steps.

- Assign all trips to the links along their selected paths.
- After all assignments, examine the volume on each link and adjust its impedance based on the volume-to-capacity ratio.
- Repeat the assignment process for a set number of iterations or until specified criteria related to minimizing travel delays are satisfied.

Calibration of the street network included modification of the centroid connectors to more accurately represent the location at which traffic accesses local roads; adjustment of speeds from posted speed limits to reflect the attractiveness of the route and the prevailing speed of traffic; and refinement of turn penalties as discussed below.

Turn Penalties

Turn penalties are used to prohibit or add delay to certain turning movements. PTAM prohibits traffic from getting off a freeway ramp and then immediately getting back on. The model also prohibits traffic from making turns across impassable medians. In addition, the model does not allow U-turns in order to avoid counter-intuitive traffic routing.

MODEL VALIDATION

Model validation is the term used to describe model performance in terms of how closely the model's output matches existing travel data in the base year. During the model development process, these outputs are used to further calibrate model inputs. The extent to which model outputs match existing travel data validates the assumptions of the inputs. Traditionally, most model validation guidelines have focused on the performance of the trip assignment function in accurately assigning trips to the street network. This metric is called static validation, and it remains the most common means of measuring model accuracy.

PTAM model was statically validated to ensure it replicated existing traffic conditions. The validation process involved the calibration of model parameters in the land use and street network files, as well as other key model components. The parameters were iteratively adjusted until the model attained validation criteria established by the California Transportation Commission.

As part of the validation process, Peak Hour traffic counts were obtained from the City of Pomona. Traffic counts on freeway facilities were obtained from the California Department of Transportation (Caltrans) Traffic Data Branch and the Performance Measurement System (PeMS) which is conducted by the Department of Electrical Engineering and Computer Sciences at the University of California at Berkeley.

Model Validation Guidelines

The California Transportation Commission has established guidelines for determining whether a model is valid and acceptable for forecasting future year traffic volumes. The sub-area validation results were compared to the validation thresholds discussed in *2010 California Regional Transportation Plan Guidelines* (California Transportation Commission, January, 2011).

- The two-way sum of the volumes on all roadway links for which counts are available should be within 10 percent of the counts.

- All of the roadway screenlines should be within the maximum desirable deviation of at least 75 percent.

- At least 75 percent of the roadway links for which counts are available should be within the maximum desirable deviation, which ranges from approximately 14 to 68 percent depending on total volume (the larger the volume, the less deviation is permitted).

- The correlation coefficient between the actual ground counts and the estimated traffic volumes should be greater than 88 percent.

- The percent root mean square (RMSE) should not exceed 40 percent.

Model Validation Results

Modifications were made to key model components such as the street network, land use data (correcting school locations and enrollment numbers), and trip generation rates during the calibration process, with the final inputs being based upon the results of successful model calibration and validation to traffic counts collected in the City.

The validity of PTAM was tested under weekday Peak Hour conditions. Model volumes were compared to existing traffic counts at 268 count sites for weekday AM and PM peak hour validation. We also used a total of six screenlines locations representing major travel corridors within the City. These screenlines are used to ensure that the general direction of travel flow through the corridors is appropriate in magnitude.

As shown in Table 2, PTAM meets or exceeds the guidelines for model accuracy under peak weekday conditions. Therefore, the base year (2012) model is considered to be valid to 2012 traffic conditions.

Based on the static validation results, PTAM is appropriate for future year scenario forecasting of traffic volumes on roadway segments and at study intersections. Furthermore, the use of the model ensures a high level of confidence in the resulting traffic volume forecasts that will be used in the evaluation of the General Plan and Corridors Specific Plan.

TABLE 2
RESULTS OF DAILY HIGHWAY STATIC MODEL VALIDATION:
BASE YEAR (20012) PTAM

Validation Statistic	Criterion for Acceptance	Model Results	
		AM Peak Hour	PM Peak Hour
% of Links within Caltrans Standard Deviations	75%	79%	78%
% of Screenlines within Caltrans Standard Deviations	100%	100%	100%
2-way Sum of All Links Counted	Within 10%	1%	2%
Correlation Coefficient	Greater than 88%	95%	94%
RMSE	40% or less	27%	29%

Future Year Model Development

Following validation of base year (2012) forecasts, future year land use and roadway improvements were added to the validated base year (2012) model to produce forecasts of future vehicle flows with buildout of the General Plan and Corridors Specific Plan projects.

Future year land use and roadway improvements were provided by Rincon, the prime consultant for the General Plan and Corridors Specific Plan EIR.

Model runs for the future year (2035) alternative were then performed to estimate the average daily and peak hour (weekday) traffic volumes and vehicle miles traveled on the major roadways in and around the PTAM area. The modeled network area includes all 2012 SCAG RTP/SCS fiscally constrained network and planned modifications associated with the City's General Plan and Corridors Specific Plan assessment.

The model results were "adjusted" using methodologies consistent with the NCHRP 255 report documenting forecasting procedures. The adjusted volumes utilize the "difference method" which applies the following formula to individual roadway segments and intersections:

- Adjusted Future Volume = Field Count + (Model Future Volume – Model Base Volume)