Palo Alto Public Safety Building and Public Parking Structure
Final Transportation Impact Analysis

May 2, 2018
Prepared for the City of Palo Alto
SD16-0223
Table of Contents

EXECUTIVE SUMMARY ........................................................................................................................................5

1.0 INTRODUCTION ...........................................................................................................................................8

Project Description ...............................................................................................................................................8
Study Area .........................................................................................................................................................13
Analysis Scenarios ...........................................................................................................................................14
Analysis Methods ...............................................................................................................................................14
  Signalized Intersections .................................................................................................................................15
  Unsignalized Intersections ............................................................................................................................16
Level of Service (LOS) Standards and Impact Criteria .....................................................................................16
  Traffic Operations Impact Criteria ................................................................................................................17
  Pedestrian and Bicycle Impact Criteria .........................................................................................................17
  Transit Impact Criteria ...................................................................................................................................18
Report Organization ...........................................................................................................................................18

2.0 EXISTING CONDITIONS ..............................................................................................................................19

Existing Transportation Facilities ....................................................................................................................19
  Existing Street System ..................................................................................................................................19
  Existing Pedestrian Facilities .......................................................................................................................20
  Existing Bicycle Facilities ............................................................................................................................20
City of Palo Alto Bicycle + Pedestrian Transportation Plan .............................................................................22
Santa Clara Countywide Bicycle Plan ............................................................................................................24
  Existing Transit Service ................................................................................................................................24
Existing Intersection Volumes and Lane Configurations ................................................................................28
Existing Parking ................................................................................................................................................28
Existing Intersection Levels of Service .........................................................................................................30
  Field Observations ......................................................................................................................................30

3.0 EXISTING PLUS PROJECT CONDITIONS .................................................................................................32

Project Traffic Estimates ...................................................................................................................................32
Trip Generation Estimates ...................................................................................................................................32
  Trip Generation ............................................................................................................................................34
  Trip Distribution and Assignment ................................................................................................................34
Existing Plus Project Intersection Levels of Service ................................................................. 39
Existing Plus Project Intersection Impacts and Mitigation Measures ........................................ 39
Pedestrian, Bicycle, and Transit Impacts and Mitigation .......................................................... 41

4.0  BACKGROUND CONDITIONS ............................................................................................ 42

Background No Project Traffic Volumes .................................................................................. 42
Background Roadway Improvements ....................................................................................... 43
Background With Project Intersection Volumes ........................................................................ 43
Background Intersection Levels of Service .............................................................................. 43
Background Intersection Impacts and Mitigation Measures ..................................................... 47
Pedestrian, Bicycle, and Transit Impacts and Mitigation .......................................................... 47

5.0  CUMULATIVE CONDITIONS ............................................................................................. 48

Cumulative No Project Traffic Volumes .................................................................................. 48
Cumulative Roadway Improvements ....................................................................................... 49
Cumulative Plus Project Traffic Volumes ................................................................................ 49
Cumulative Intersection Levels of Service .............................................................................. 49
Signal Warrant Analysis ........................................................................................................... 53
Cumulative Intersection Impacts and Mitigation Measures ..................................................... 53
Pedestrian, Bicycle, and Transit Impacts and Mitigation .......................................................... 53

6.0  SITE ACCESS AND ON-SITE CIRCULATION ................................................................. 54

Site Access and Circulation ....................................................................................................... 54
Pedestrian and Bicycle Access and Circulation ........................................................................ 56
Transit Access .......................................................................................................................... 57
Parking Requirements .............................................................................................................. 57

7.0  OTHER TRANSPORTATION CONSIDERATIONS ............................................................ 58

Neighborhood Impacts ............................................................................................................ 58
Vehicle Miles Traveled (VMT) ................................................................................................... 58
Trip Length Data Source .......................................................................................................... 59
VMT Estimates .......................................................................................................................... 59
Senate Bill (SB) 743 Assessment ............................................................................................... 60
Queuing Analysis ..................................................................................................................... 62
Appendices

Appendix A: Traffic Counts
Appendix B: Trip Generation Surveys
Appendix C: Intersection Technical Calculations

List of Figures

Figure 1  Project Location and Study Intersections .......................................................... 9
Figure 2a Public Safety Building Site Plan ........................................................................ 10
Figure 2b-1 Parking Structure Site Plan ............................................................................ 11
Figure 2b-2 Parking Structure Floor Details ...................................................................... 12
Figure 3  Existing Pedestrian and Bicycle Facilities ......................................................... 23
Figure 4  Existing Transit Services .................................................................................. 27
Figure 5  Existing Peak Hour Traffic Volumes, Lane Configurations, and Traffic Control Devices ........................................................................................................ 29
Figure 6  Project Trip Distribution ................................................................................... 36
Figure 7  Project Trip Assignment ................................................................................... 37
Figure 8  Existing plus Project Peak Hour Traffic Volumes, Lane Configurations, and Traffic Control Devices.................................................................................. 38
Figure 9  Background No Project Peak Hour Traffic Volumes, Lane Configurations, and Traffic Control Devices.................................................................................. 44
Figure 10 Background plus Project Peak Hour Traffic Volumes, Lane Configurations, and Traffic Control Devices.................................................................................. 45
Figure 11 Cumulative No Project Peak Hour Traffic Volumes, Lane Configurations, and Traffic Control Devices.................................................................................. 50
Figure 12 Cumulative Plus Project Peak Hour Traffic Volumes, Lane Configurations, and Traffic Control Devices.................................................................................. 51
List of Tables

Table 1: Signalized Intersection Level of Service Definitions ................................................................. 15
Table 2: Unsignalized Intersection Level of Service Definitions ...................................................................... 16
Table 3: Existing Transit Services ................................................................................................................. 25
Table 4: Existing Intersections Level of Service .......................................................................................... 31
Table 5: Existing and Proposed Development .............................................................................................. 32
Table 6: Vehicle Trip Rates at Existing Parking Lots ...................................................................................... 33
Table 7: Project Vehicle Trip Generation Estimates ......................................................................................... 34
Table 8: Trip Distribution ................................................................................................................................ 35
Table 9: Existing with Project Intersections Level of Service ........................................................................ 40
Table 10: Background and Background Plus Project Intersections Level of Service ................................... 46
Table 11: Cumulative and Cumulative Plus Project Intersections Level of Service .................................. 52
Table 12: Daily Vehicle Miles Traveled per Capita ......................................................................................... 61
Table 13: Left-Turn Queues .......................................................................................................................... 64
EXECUTIVE SUMMARY

This report presents the results of the Transportation Impact Analysis (TIA) conducted for the proposed Public Safety Building (PSB) and Public Parking Structure to be located on Sherman Avenue in the City of Palo Alto, California. The existing site currently comprises public parking Lots C-6 and C-7. The PSB would be developed on Lot C-6 and the Public Parking Structure on Lot C-7. The proposed project would remove the existing surface parking lots (which totals approximately 310 parking spaces) to construct: a new three-story Public Safety Building that would range in size from 45,000 to 50,000 square feet (s.f.) and a new Parking Structure with approximately 460 to 640 parking spaces (i.e. 160 to 340 net new spaces).

The impacts of the proposed project were evaluated following guidelines of the City of Palo Alto, the Santa Clara Valley Transportation Authority (VTA), and the congestion management agency for Santa Clara County.

PROJECT TRAFFIC ESTIMATES

Project-generated trips were estimated using for the proposed PSB were based on trip generation studies conducted by Portland State University and at the Central Police precinct of Vancouver, Washington.

Vehicle trip estimates for the net new parking spaces were estimated based on parking surveys conducted at the two existing parking lots (Lots C-6 and C-7) during the AM and PM peak period. Parking facilities are not typically traffic generators by themselves. Trips are actually generated by the nearby retail, office and residential uses, and parking lots or structures simply provide vehicle storage. The Parking Structure trips are generally going to be existing vehicles that currently park at adjacent facilities (e.g. street parking, Lot C-8, etc.), but now park in the new Parking Structure.

The proposed project is estimated to generate 2,822 net new daily trips, 129 net new AM peak hour trips (74 inbound and 55 outbound), 238 net new PM peak hour trips (116 inbound and 122 outbound).

PROJECT IMPACTS

This analysis identified potentially significant impacts of the proposed project on the surrounding transportation system and recommends measures to mitigate significant impacts for environmental clearance.
INTERSECTION IMPACTS

Intersection impacts were evaluated for “Plus Project” scenarios under Existing, Background, and Cumulative Conditions by comparing the results to the appropriate “No Project” scenario.

Based on the significance impact criteria by the City of Palo Alto and Valley Transportation Authority (VTA) Congestion Management Program, the Project is expected to have a less-than-significant impact at all 10 study intersections under Plus Project conditions for the Existing, Background, and Cumulative scenarios. Accordingly, no traffic mitigation measures are needed.

PEDESTRIAN, BICYCLE, AND TRANSIT IMPACTS

While the project is expected to generate new non-auto trips, the existing pedestrian, bicycle, and transit facilities would accommodate the additional demand. Furthermore, the City of Palo Alto Bicycle + Pedestrian Transportation Plan (May 2012), includes the identification of a bicycle boulevard on Park Boulevard. This project does not conflict with that planned bicycle facility. Therefore, the Project’s impact to the pedestrian, bicycle, and transit facilities is considered less-than-significant, and no off-site mitigation is needed to support multi-modal travel to and from the site.

SITE ACCESS AND ON-SITE CIRCULATION

The general on-site circulation patterns and site access for the PSB and Parking Structure are considered adequate. The PSB would be served by one primary inbound and outbound secured driveway on Sherman Avenue, approximately 85 feet west of Park Avenue. A secondary inbound and outbound driveway would be provided on Birch Street, adjacent to Jacaranda Lane. These two driveways would provide direct access to the PSB’s basement parking that would include 170 to 190 parking spaces for police department service vehicles or PSB staff. To accommodate all turning movements at the PSB’s Birch Street outbound driveway, it is recommended that the westbound left-turn movement on Jacaranda Lane be prohibited to reduce vehicle potential conflicts and right-of-way confusion for drivers.

The Public Parking Structure’s driveway is recommended to be located on Sherman Avenue, near the Birch Street intersection. This location provides adequate queuing storage on Sherman Avenue for inbound vehicles. The Parking Structure could potentially be gated at the entrance if a payment system was implemented; however, given the ample capacity available on Sherman Avenue and the relatively low peak hour volumes, it is anticipated that gating the entrance would only result in short temporary vehicle queues on Sherman Avenue and traffic flow would not be substantially affected.
Key Project site improvements are recommended to accommodate all modes of travel:

- Class I long-term bicycle parking such as lockers or secured room should be provided for employee use.
- Provide Class II short-term bicycle parking racks such as inverted u-style bicycle parking racks.
- To enhance safety for pedestrians, it is recommended that signage and or warning systems be installed at all driveways to notify pedestrians of approaching vehicles and to make drivers aware of potential conflicts with pedestrians.

OTHER TRANSPORTATION CONSIDERATIONS

The Project’s PSB related traffic is expected to add minimal traffic to the adjacent residential streets on Birch Street and Park Boulevard. However, due to the nominal increase in traffic from the Project and the ample capacity on those roadways, it is not anticipated that the Project will result in any impacts to the adjacent neighborhoods.

The vehicle miles traveled (VMT) for a new development project is estimated by adding the VMT for all vehicles generated by a site or use. VMT was only calculated for the PSB and not the Parking Structure as the PSB would be generating new traffic to the site and parking facilities would not. The VMT was calculated for years 2020 and 2040, which are the two future years of the MTC MPO Travel Demand Model. Based on the project’s expected number of employees and the trip lengths from the California Household Travel Survey, the Project’s average weekday VMT (generated by the PSB) would be approximately 2,918 VMT under 2020 Conditions, which equates to 18.2 VMT per employee, and 3,015 VMT under 2040 Conditions, which equates to 18.8 VMT per employee. The average trip length for employees at the proposed Project is estimated to be more than 15 percent below the regional averages, which would result in a less-than-significant impact for VMT (assuming current draft regulations in regards to SB 743 were in effect, which currently is anticipated to be required by July 1, 2019).

Lastly, a queueing analysis was conducted for critical left-turn movements at study signalized intersections. Based on the analysis, there would be no significant impact to queueing at the study intersections.
1.0 INTRODUCTION

This report presents results of the Transportation Impact Analysis (TIA) conducted for the proposed Public Safety Building (PSB) and Public Parking Structure on Sherman Avenue in the City of Palo Alto, California. The analysis was conducted to evaluate the effects of the Project on the surrounding transportation system and to identify measures to mitigate any significant mobility impacts. The TIA was prepared following guidelines of the City of Palo Alto and Santa Clara Valley Transportation Authority (VTA), the congestion management agency for Santa Clara County. This chapter provides a detailed project description and outlines the Project Study area, analysis methodologies, and significance criteria.

PROJECT DESCRIPTION

The proposed project is located in the Evergreen Park neighborhood of Palo Alto at the corner of Sherman Avenue and Birch Street. The existing site currently comprises of public parkingLots C-6 and C-7. The PSB would be developed on Lot C-6 and the Public Parking Structure on Lot C-7. The sites are generally bounded by Jacaranda Lane to the north, Sherman Avenue to the south, Park Boulevard to the east, and Ash Street to the west. The proposed project would remove the existing surface parking lots (which totals approximately 310 parking spaces) to construct a new three-story Public Safety Building that would range in size from 45,000 to 50,000 square feet for approximately 160 employees, a new Public Parking Structure with approximately 460 to 640 parking spaces (i.e. 160 to 340 net new spaces). The site location is shown on Figure 1 and the proposed site plans are shown on Figure 2a and Figure 2b-1. Figure 2b-2 depicts the parking structure floor details.
Figure 1

Project Site and Study Intersections
Source: Ross Drulis Cusenbery, 2017

Figure 2a
Public Safety Building Site Plan
Source: Ross Drulis Cusenbery, 2017

Figure 2b-1
Parking Structure Site Plan
Figure 2b-2
Parking Structure Floor Details
STUDY AREA

Project impacts on the study area roadway facilities were determined by measuring the effect Project traffic would have on intersection operations during the morning (6:00 to 9:00 AM) and evening (4:00 to 7:00 PM) peak periods. A total of 10 intersections, as shown in Figure 1, were selected as study locations. These locations include:

Study Intersections

1. Park Boulevard / Sherman Avenue
2. Park Boulevard / Page Mill Road
3. Birch Street / Sherman Avenue
4. Birch Street / Grant Street
5. Birch Street / Sheridan Avenue
6. Ash Street / California Street
7. El Camino Real / Cambridge Avenue
8. El Camino Real / California Avenue
9. El Camino Real / Page Mill Road
10. Middlefield Road / Oregon Expressway

VTA’s TIA guidelines indicates that intersections should be included if the proposed Project adds 10 or more peak hour vehicles per lane to any intersection movement. In consultation with the City of Palo Alto staff, the listed intersections were selected based on VTA’s ten trip per lane guideline.

Freeway Segments

According to VTA’s Transportation Impact Analysis Guidelines (VTA, 2014) a freeway segment analysis should be included if the Project meets one of the following requirements:

1. The proposed development Project is expected to add traffic equal to at least one percent of a freeway segment’s capacity.
2. The proposed development Project is adjacent to one of the freeway segment’s access or egress points
3. Based on engineering judgment, Lead Agency staff determines that the freeway segment should be included in the analysis.

The nearest freeways to the Project site are I-280 and US 101, which are approximately three miles and two miles away, respectively. The capacity for a freeway mixed-flow lane for freeway facilities greater than two lanes in one direction is 2,300 vehicles per hour per lane (vphpl), 2,200 vphpl for freeway facilities with two lanes or less in one direction, and 1,650 vphpl for HOV lanes. The segments of I-280 between Alpine Road
and El Monte Road has a direction capacity of 9,200 vphpl, and the segments of US 101 between San Antonio Avenue and Embarcadero Road has a one direction capacity of 8,550 vphpl.

The Project is not anticipated to meet any of the three criteria listed above; therefore, no freeway segment analysis was conducted for the proposed Project.

ANALYSIS SCENARIOS

The operations of the study intersections were evaluated during the weekday morning (AM) and weekday evening (PM) peak hours for the following scenarios as presented in Chapters 2, 3, 4, and 5:

**Scenario 1:** *Existing Conditions* – Existing volumes obtained from counts.

**Scenario 2:** *Existing plus Project Conditions* – Scenario 1 volumes plus traffic generated by the proposed Project.

**Scenario 3:** *Background No Project Conditions* – Existing volumes plus traffic from “approved but not yet built” and “unoccupied” developments in the area.

**Scenario 4:** *Background plus Project Conditions* – Scenario 3 volumes plus traffic generated by the proposed Project.

**Scenario 5:** *Cumulative (2035) No Project Conditions* – Cumulative (2035) traffic volumes from the City of Palo Alto’s updated travel demand forecast, which is based on City of Palo Alto Comprehensive Plan land uses and funded transportation improvements.

**Scenario 6:** *Cumulative (2035) plus Project Conditions* – Scenario 5 volumes plus traffic generated by the proposed Project.

ANALYSIS METHODS

The operations of roadway facilities are described with the term level of service. Level of Service (LOS) is a qualitative description of traffic flow based on factors such as speed, travel time, delay, and freedom to maneuver. Six levels are defined from LOS A, the best operating conditions, to LOS F, the worst operating conditions. LOS E represents “at-capacity” operations. When traffic volumes exceed the intersection capacity, stop-and-go conditions result, and operations are designated as LOS F.
SIGNALIZED INTERSECTIONS

The method described in Chapter 16 of the 2000 *Highway Capacity Manual* (HCM) (Special report 209, Transportation Research Board) was used to prepare the level of service calculation for the study intersections. This level of service method, which is approved by the City of Palo Alto and VTA, analyzes a signalized intersection’s operation based on average control delay per vehicle. Control delay includes the initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay. The average control delay for signalized intersections is calculated using TRAFFIX traffic analysis software and is correlated to a LOS designation as shown in Table 1. In addition, critical delay is also a factor for determining the intersection’s operation. Critical delay represents the delay associated with the critical movements of the intersection, or the movements that require the most “green time” and have the greatest effect on overall intersection operations. The changes in critical delay and critical volume-to-capacity (V/C) ratio between baseline (i.e. “No Project”) and “Plus Project” conditions are used to identify significant impacts.

**TABLE 1: SIGNALIZED INTERSECTION LEVEL OF SERVICE DEFINITIONS**

<table>
<thead>
<tr>
<th>Level of Service</th>
<th>Description</th>
<th>Average Control Delay per Vehicle (seconds)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Operations with very low delay occurring with favorable progression and/or short cycle lengths.</td>
<td>≤ 10.0</td>
</tr>
<tr>
<td>B+</td>
<td>Operations with low delay occurring with good progression and/or short cycle lengths.</td>
<td>10.1 to 12.0</td>
</tr>
<tr>
<td>B</td>
<td></td>
<td>12.1 to 18.0</td>
</tr>
<tr>
<td>B-</td>
<td></td>
<td>18.1 to 20.0</td>
</tr>
<tr>
<td>C+</td>
<td>Operations with average delays resulting from fair progression and/or longer cycle lengths. Individual cycle failures begin to appear.</td>
<td>20.1 to 23.0</td>
</tr>
<tr>
<td>C</td>
<td></td>
<td>23.1 to 32.0</td>
</tr>
<tr>
<td>C-</td>
<td></td>
<td>32.1 to 35.0</td>
</tr>
<tr>
<td>D+</td>
<td>Operations with longer delays due to a combination of unfavorable progression, long cycle lengths, and high volume-to-capacity (V/C) ratios. Many vehicles stop and individual cycle failures are noticeable.</td>
<td>35.1 to 39.0</td>
</tr>
<tr>
<td>D</td>
<td></td>
<td>39.1 to 51.0</td>
</tr>
<tr>
<td>D-</td>
<td></td>
<td>51.1 to 55.0</td>
</tr>
<tr>
<td>E+</td>
<td>Operations with high delay values indicating poor progression, long cycle lengths, and high V/C ratios. Individual cycle failures are frequent occurrences.</td>
<td>55.1 to 60.0</td>
</tr>
<tr>
<td>E</td>
<td></td>
<td>60.1 to 75.0</td>
</tr>
<tr>
<td>E-</td>
<td></td>
<td>75.1 to 80.0</td>
</tr>
<tr>
<td>F</td>
<td>Operations with delays unacceptable to most drivers occurring due to over-saturation, poor progression, or very long cycle lengths.</td>
<td>&gt; 80.0</td>
</tr>
</tbody>
</table>

UNSIGNALIZED INTERSECTIONS

Operations of the unsignalized intersections (e.g. stop-sign controlled) were evaluated using the methods contained in Chapter 17 of the 2000 HCM and calculated using TRAFFIX analysis software. LOS ratings for stop-sign controlled intersections are based on the average control delay expressed in seconds per vehicle. At two-way or side-street-stop controlled intersections, control delay is calculated for each movement, not for the intersection as a whole. For approached composed of a single lane, control delay is computed as the average of all movements in that lane. For all-way-stop-controlled locations, a weighted average delay for the entire intersection is presented. Table 2 summarizes the relationship between delay and LOS for unsignalized intersections.

<table>
<thead>
<tr>
<th>Level of Service (v/c ≤ 1.0)</th>
<th>Description</th>
<th>Average Control Delay Per Vehicle (Seconds)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Little or no delay.</td>
<td>≤ 10.0</td>
</tr>
<tr>
<td>B</td>
<td>Short traffic delay.</td>
<td>&gt; 10.0 to 15.0</td>
</tr>
<tr>
<td>C</td>
<td>Average traffic delays.</td>
<td>&gt; 15.0 to 25.0</td>
</tr>
<tr>
<td>D</td>
<td>Long traffic delays.</td>
<td>&gt; 25.0 to 35.0</td>
</tr>
<tr>
<td>E</td>
<td>Very long traffic delays.</td>
<td>&gt; 35.0 to 50.0</td>
</tr>
<tr>
<td>F</td>
<td>Extreme traffic delays with intersection capacity exceeded.</td>
<td>&gt; 50.0</td>
</tr>
</tbody>
</table>


LEVEL OF SERVICE (LOS) STANDARDS AND IMPACT CRITERIA

The determination of significance for project impacts is based on applicable policies, regulations, goals, and guidelines defined by the City of Palo Alto and the Santa Clara County Congestion Management Plan. The LOS standard for the City of Palo Alto intersections is LOS D. The Page Mill Road/El Camino Real (intersection 9) and the Middlefield Road/El Camino Real (intersection 10) intersections are designated as a Congestion Management Program (CMP) intersection. The threshold for CMP intersections is LOS E. The impacts of the Project were evaluated by comparing the results of the level of service calculations under the “Plus Project” scenarios to the baseline “No Project” scenarios. The detailed impact criteria for this study are presented below.
TRAFFIC OPERATIONS IMPACT CRITERIA

The following LOS standards and impact criteria were applied to the intersection analysis.

**Signalized Intersections**

Significant impacts at signalized City of Palo Alto intersections are defined to occur when the addition of Project traffic causes one of the following:

- Intersection operations to degrade from an acceptable level (LOS D or better for City of Palo Alto, and LOS E or better for regionally significant roadways and CMP intersections) under "No Project" conditions to an unacceptable level (LOS E or F for City of Palo Alto intersections, and LOS F for regionally significant roadways and CMP intersections) for "Plus Project" conditions; or
- Exacerbate unacceptable "No Project" operations (LOS E or F for City of Palo Alto intersections, and LOS F for regionally significant roadways and CMP intersections) by increasing the critical delay by more than four (4) seconds and increasing the volume-to-capacity (V/C) ration by 0.01 or more; or
- An increase in the V/C ratio of 0.01 or more at an intersection with unacceptable operations (LOS E or F for City of Palo Alto intersections and LOS F for regionally significant roadways and CMP intersections) when the change in critical delay between No Project and Plus Project conditions is negative (i.e. decreases). Decreases in critical delay can occur if the critical movements change.

**Unsignalized Intersections**

LOS analysis at unsignalized intersections is generally used to determine the need for modifying intersection control type (i.e. all-way stop or signalization). As part of this evaluation, traffic volumes, delays, and peak hour traffic signal warrants are evaluated to determine if the existing intersection control is appropriate.

The City has generally used LOS D as the minimum acceptable operating level at unsignalized intersections. Significant impacts are defined to occur when the addition of Project traffic degrades operations to LOS E or LOS F and the intersection satisfies the peak hour signal warrants from the *California Manual of Uniform Traffic Control Devices (MUTCD)*.

**PEDESTRIAN AND BICYCLE IMPACT CRITERIA**

The City of Palo Alto *Comprehensive Plan* describes related policies necessary to ensure that pedestrian and bicycle facilities are safe and effective for City residents. Using the *Comprehensive Plan* as a guide, significant impacts to these facilities would occur when a Project or an element of a Project:

- Creates a hazardous condition that currently does not exist for pedestrians and bicyclists, or otherwise interferes with pedestrian or bicycle accessibility to the site and adjoining areas; or
• Conflicts with an existing or planned pedestrian or bicycle facility; or
• Conflicts with policies related to bicycle and pedestrian activity adopted by the City of Palo Alto, Santa Clara County, VTA, or Caltrans for their respective facilities in the study area.

TRANSIT IMPACT CRITERIA

Significant impacts to transit service would occur if the Project or any part of the Project:

• creates demand for public transit services above the capacity which is provided or planned;
• disrupts existing transit services or facilities;\(^1\) or
• conflicts with an existing or planned transit facility; or
• conflicts with transit policies adopted by the City of Palo Alto, Santa Clara County, VTA, or Caltrans for their respective facilities in the study area.

REPORT ORGANIZATION

The remainder of this report is divided into the following chapters:

• **Chapter 2 – Existing Conditions** describes the transportation system near the Project, including the surrounding roadway network, morning and evening peak period driveway and intersection turning movement volumes, existing bicycle, pedestrian, transit, and parking facilities, intersection levels of service.

• **Chapter 3 – Existing with Project Conditions** addresses the Existing with Project Conditions, and discusses Project vehicular, pedestrian, bicycle, and transit impacts. The relevant Project information, such as the Project components and Project trip generation, distribution, and assignment, is also discussed in this chapter.

• **Chapter 4 – Background Traffic Conditions** addresses the conditions with approved, but not yet constructed projects. The chapter discusses these conditions, both without and with the Project, and discusses Project vehicular impacts.

• **Chapter 5 – Cumulative Traffic Conditions** addresses the 2035 cumulative conditions, both without and with the Project, and discusses cumulative Project vehicular impacts.

• **Chapter 6 – Site Access, Circulation and Parking** describes Project access and circulation for all travel modes.

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\(^1\) This includes disruptions caused by proposed-project driveways on transit streets and impacts to transit stops/shelters, as well as impacts to transit operations from traffic improvements proposed or resulting from a project.
2.0 EXISTING CONDITIONS

This chapter describes the Existing Conditions of the roadway facilities, pedestrian, and bicycle facilities, as well as parking and transit services near the Project site. It also presents existing traffic volumes and operations for the study intersections with the results of LOS calculations.

EXISTING TRANSPORTATION FACILITIES

EXISTING STREET SYSTEM

Access to and from the Project site is provided by the following roads: Page Mill Road, El Camino Real, Oregon Expressway, Bryant Street, Park Boulevard, Birch Street, Ash Street, Cambridge Avenue, California Avenue, Sherman Avenue, Grant Avenue, and Sheridan Avenue. Each facility is described below in more detail.

Page Mill Road is a two to four lane east-west divided arterial road that extends west to Los Altos Hills and connects with Oregon Expressway at El Camino Real. Within the study area, the roadway provides four travel lanes (two in each direction) with exclusive left-turns at all intersections. The posted speed limit ranges between 35 and 50 miles per hour (mph). Page Mill Road provides access to local commercial and industrial areas as well as access to I-280. East of Ash Street, Page Mill Road transitions into Oregon Expressway, and another short street segment designated as Page Mill Road connects the expressway with the California Avenue Transit Station parking lot.

El Camino Real (also identified as State Route 82) is a major north-south arterial that connects San Francisco to San Jose. El Camino Real provides access to local and regional commercial areas. Direct access to the site from El Camino Real is provided via Sherman Avenue. The posted speed limit is 35 mph.

Oregon Expressway is a four-lane, east-west expressway that extends between Alma Street and US 101. Oregon Expressway provides access to local residential areas, as well as access to US 101. West of El Camino Real, the roadway becomes Page Mill Road. Eastbound and westbound traffic is divided by a raised median with enhanced landscaping. Westbound traffic accesses the Project site via ramps at Birch Street. Eastbound traffic accesses the Project site via Sherman Avenue by turning left on El Camino Real or via the Page Mill Road ramps connecting to Park Boulevard. The posted speed limit is 35 mph.
**Park Boulevard** is a two-lane, north-south road that extends from Whitclem Drive in the south to El Camino Real in the north. The roadway is primarily a local road, however near the Project site, it is designated as a collector road. The posted speed limit is 25 mph.

**Birch Street** is a north-south road that extends from Park Boulevard in the north to Oregon Expressway in the south. The road has four lanes between Oregon Expressway and California Avenue and two lanes between California Avenue and Park Boulevard. Birch Street is a collector street between Oregon Expressway and California Avenue, and a local street between California Avenue and Park Boulevard. The posted speed limit is 25 mph.

**California Avenue** is a two-lane east-west collector road that extends from Amherst Street (to the west) to Park Boulevard (east of the site). California Avenue is fronted by retail and restaurants and includes angled parking on both sides of the street. The posted speed limit is 25 mph.

**Sherman Avenue** is a two-lane east-west local road that connects El Camino Real in the west to Park Boulevard in the east. The posted speed limit is 25 mph and on-street parking is provided on both sides of the roadway.

**Grant Avenue** is an east-west local road that extends from El Camino Real in the west to Park Boulevard in the east. The road includes two lanes from El Camino Real to Birch Street and becomes a one-way eastbound road east of Birch Street.

**EXISTING PEDESTRIAN FACILITIES**

Pedestrian facilities comprise sidewalks, crosswalks, and pedestrian signals at signalized intersections. Most streets near the Project site have sidewalks on both sides of the street. Marked crosswalks are provided across all legs of study signalized intersections. A Rectangular Rapid Flashing Beacon (RRFB) pedestrian signal is present at the south crosswalk across the Park Boulevard/Page Mill Road intersection. The Project site is located immediately south of the commercial corridor along California Avenue, where there is a high amount of pedestrian traffic. Within the commercial corridor, pedestrian enhancements include wide sidewalks, curb extensions (also known as bulb-outs), and ample amount of landscaped buffers. **Figure 3** presents study locations with pedestrian crosswalks.

**EXISTING BICYCLE FACILITIES**

Guidelines and design standards for bikeway planning and design in California are established by California Department of Transportation (Caltrans) and presented in the *Highway Design Manual* (Chapter 1000: Bikeway Planning and Design). For local reference, the *City of Palo Alto Bicycle + Pedestrian Transportation*
Plan (May 2012) provide a bikeway planning and design tool. Bicycle facilities comprise paths (Class I), lanes (Class II), routes (Class III), and boulevards (Class III) as described below and shown on the accompanying figures.

- **Class I Bikeway** (Bicycle Path) provides a completely separate right-of-way and is designated for the exclusive use of bicycles and pedestrians with vehicle and pedestrian cross-flow minimized.

- **Class II Bikeway** (Bicycle Lane) provides a restricted right-of-way and is designated for the use of bicycles with a striped lane on a street or highway. Bicycle lanes are generally four to six feet wide. Adjacent vehicle parking and vehicle/pedestrian cross-flow are permitted.

- **Class III Bikeway** (Bicycle Route) provides for a right-of-way designated by signs or pavement markings (sharrows) for shared use with pedestrians or motor vehicles. Sharrows are a type of pavement marking (bike and arrow stencil) placed to guide bicyclists to the best place to ride on the road, avoid car doors, and remind drivers to share the road with cyclists.
• **Class IIIA Bikeway (Bicycle Boulevard)** is a modified bicycle route providing convenient and efficient through route for cycles of all skill levels. A bike boulevard includes signage, pavement markings, and in some cases, traffic calming (e.g., mid-block closures to vehicles), and bike lanes.

**Figure 3** presents existing bicycle facilities within the vicinity of the Project site. These facilities include:

- Bicycle lanes on:
  - Park Boulevard between El Camino Real and Lambert Avenue
  - Page Mill Road west of El Camino Real
  - California Avenue west of El Camino Real and east of Alma Street

- Bicycle routes on:
  - California Avenue between Park Boulevard and El Camino Real
  - Bryant Street between Palo Alto Ave and Los Robles Avenue

**CITY OF PALO ALTO BICYCLE + PEDESTRIAN TRANSPORTATION PLAN**

The *City of Palo Alto Bicycle + Pedestrian Transportation Plan* (May 2012) contains the policy vision, design guidance, and specific recommendations to guide public and private investments in active transportation (pedestrian and bicycle) facilities and related programs in the City of Palo Alto. In addition to the bicycle boulevard on Park Boulevard near the Project site, planned bicycle improvements include:

Bicycle lanes on:

- El Camino Real south of Page Mill Road
- California Avenue between El Camino Real and Park Boulevard

Bicycle routes on:

- El Camino Real north of Page Mill Road
- Page Mill Road/Oregon Expressway east of El Camino Real
Figure 3

Existing Bicycle and Pedestrian Facilities
SANTA CLARA COUNTYWIDE BICYCLE PLAN

The adopted Santa Clara Countywide Bicycle Plan synthesizes other local and County plans into a comprehensive 20-year cross-county bicycle corridor network and expenditure plan (May 2008). The long-range countywide transportation plan and the means by which projects compete for funding and prioritization are documented in the Valley Transportation Plan (VTP) 2035 (adopted in January 2009). The Santa Clara Countywide Bicycle Plan includes a planned bicycle network of 16 routes of countywide or intercity significance. Several of these proposed facilities travel through the study area, including (listing street with cross county bicycle corridor number and name):

- Bryant Street (#1 US 101 Corridor)
- Park Boulevard (#2 Alma Street/Caltrain Corridor)
- California Avenue (#3 Dumbarton – East-West Connector Corridor)
- El Camino Real (#4 El Camino Real – Grand Boulevard Corridor)

The bicycle plan is currently being updated and there have been several outreach meetings to present the developed plans and obtain feedback from the community. The draft Countywide Bicycle Plan is anticipated to be completed by Summer 2017.

EXISTING TRANSIT SERVICE

Bus service in Palo Alto is operated by the VTA. Commuter rail service (Caltrain) is provided from San Francisco to Gilroy by the Peninsula Joint Powers Board. Figure 4 shows the existing transit service near the Project site. The Project site is served by VTA local, express and rapid transit routes, Caltrain, Deer Creek Caltrain shuttle, Stanford Marguerite shuttle, and AC Transit Dumbarton Express bus service. Table 3 describes the span of services and frequency of service during the week with average weekday load factors for VTA buses and Caltrain.
# TABLE 3 EXISTING TRANSIT SERVICES

<table>
<thead>
<tr>
<th>Route</th>
<th>From</th>
<th>To</th>
<th>Weekdays</th>
<th>Weekends</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Operating Hours</td>
<td>Headways (minutes)</td>
</tr>
<tr>
<td><strong>VTA</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>22</td>
<td>Palo Alto Transit Center</td>
<td>Eastridge Transit Center</td>
<td>24-hour service</td>
<td>15</td>
</tr>
<tr>
<td>89</td>
<td>California Avenue Caltrain Station</td>
<td>Palo Alto Veterans Hospital</td>
<td>9:36 AM – 6:39 PM</td>
<td>30</td>
</tr>
<tr>
<td>101</td>
<td>Camden and Highway 85</td>
<td>Palo Alto</td>
<td>6:17 AM – 6:44 PM</td>
<td>60</td>
</tr>
<tr>
<td>102</td>
<td>South San Jose</td>
<td>Palo Alto</td>
<td>5:50 AM – 6:55 PM</td>
<td>15</td>
</tr>
<tr>
<td>103</td>
<td>Eastridge Transit Center</td>
<td>Palo Alto</td>
<td>5:08 AM – 6:37 PM</td>
<td>45</td>
</tr>
<tr>
<td>104</td>
<td>Penitencia Creek Transit Center</td>
<td>Palo Alto</td>
<td>5:56 AM – 6:15 PM</td>
<td>30</td>
</tr>
<tr>
<td>182</td>
<td>Palo Alto</td>
<td>IBM/Bailey Avenue</td>
<td>7:29 AM – 6:14 PM</td>
<td>N/A: one peak hour trip</td>
</tr>
<tr>
<td>522</td>
<td>Palo Alto Transit Center</td>
<td>Eastridge Transit Center</td>
<td>4:39 AM – 11:26 PM</td>
<td>15</td>
</tr>
<tr>
<td><strong>Caltrain</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>San Francisco</td>
<td>Gilroy</td>
<td>4:30 AM – 1:34 AM</td>
<td>20-40</td>
</tr>
<tr>
<td><strong>AC Transit</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Union City BART</td>
<td>3475 Deer Creek Road</td>
<td>5:26 AM – 8:43 PM</td>
<td>20</td>
</tr>
<tr>
<td><strong>Stanford Marguerite Shuttle System</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1050 Arastradero (1050 A)</td>
<td>Li Ka Shing Center</td>
<td>1050/1070 Arastradero Road</td>
<td>7:00 AM – 7:10 PM</td>
<td>20-25</td>
</tr>
<tr>
<td>Research Park (RP)</td>
<td>Palo Alto Transit Center</td>
<td>3475/3500 Deer Creek Road</td>
<td>6:31 AM – 7:33 PM</td>
<td>20-40</td>
</tr>
<tr>
<td>Shopping Express (SE)</td>
<td>Palo Alto Transit Center</td>
<td>Showers Drive @ Walmart</td>
<td>3:15 PM – 4:15 PM</td>
<td>50-60</td>
</tr>
</tbody>
</table>

**Notes:**

1. Weekday and weekend services of November 2016.
2. Headways are defined as the time between transit vehicles on the same route (e.g. time between two Route 22 buses stopping at the Page Mill Road and El Camino Real intersection bus stops.

Sources: VTA, 2017; Caltrain, 2017; Stanford University, 2017.
Figure 4

Existing Transit Facilities

- Caltrain Station
- Caltrain Route
- Project Site
- Dumbarton Express
- VTA Rapid
- VTA Local
- VTA Express
- Bus Stop
EXISTING INTERSECTION VOLUMES AND LANE CONFIGURATIONS

Weekday morning (7:00 to 9:00 AM) and evening (4:00 to 6:00 PM) peak period intersection turning movement counts were conducted at the study locations on September 2016 on clear days with area schools in-session. During the periods that counts were conducted, construction was on-going at 385 Sherman Avenue, which resulted in the following road closures near the Project site:

- Eastbound closure of Sherman Avenue between Ash Street and Birch Street
- Northbound closure of Ash Street between Grant Ave and Sherman Ave

These closures caused minor rerouting for vehicles, particularly at the Birch Street / Sherman Avenue (study intersection 3), Ash Street / Sherman Avenue, and Ash Street / Grant Street intersections. To ensure that the traffic volumes in the area used were not substantially skewed due to the road closures, the 2016 counts at the Park Boulevard, Birch Street, and Ash Street intersections were compared to 2013 counts to determine if there were any substantial count discrepancies in data between the two years. The comparison revealed that traffic volumes and patterns were similar between 2013 and 2016, and thus, were not greatly affected by the closures. However, several turning movements at the Birch Street / Sherman Avenue intersection were closed in 2016 and the volumes were slightly lower than three years prior. Thus, 2013 counts were used for this location.

For the study intersections, the single (i.e., peak) hour with the highest traffic volumes during the count period was identified. Existing lane configurations and signal timings were obtained through field observations. The peak hour volumes are presented on Figure 5 along with the existing lane configurations and traffic controls. Detailed traffic count data are contained in Appendix A.

EXISTING PARKING

The existing parking lots (Lots C-6 and C-7) on the Project site currently provides approximately 310 total parking spaces. These lots are open to the public and include a two-hour limit. Parking occupancy counts were also conducted at the site in October 2016 for purposes of estimating vehicle trip generation rates for Lots C-6 and C-7. More information about these counts is presented in Chapter 3.

On-street parking with two-hour time limits between 8 AM and 5 PM are also provided on Cambridge Avenue, California Avenue, Sherman Avenue, and Ash Street. Non-time regulated on-street parking is provided on residential streets near the Project site, such as Grant Avenue and Sheridan Avenue.
### Traffic Volumes and Lane Configurations

**Existing (2016) Conditions - AM & PM Peak Hours**

<table>
<thead>
<tr>
<th>Site Location</th>
<th>AM Peak Hours (Vehicles/Day)</th>
<th>PM Peak Hours (Vehicles/Day)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1. Park Blvd/Sherman Ave</strong></td>
<td>153 (104)</td>
<td>134 (120)</td>
</tr>
<tr>
<td></td>
<td>134 (99)</td>
<td>119 (59)</td>
</tr>
<tr>
<td></td>
<td>8 (1)</td>
<td>7 (0)</td>
</tr>
<tr>
<td><strong>2. Park Blvd/Page Mill Rd</strong></td>
<td>206 (372)</td>
<td>221 (214)</td>
</tr>
<tr>
<td></td>
<td>11 (9)</td>
<td>11 (8)</td>
</tr>
<tr>
<td></td>
<td>14 (4)</td>
<td>16 (24)</td>
</tr>
<tr>
<td><strong>3. Birch St/Sherman Ave</strong></td>
<td>39 (13)</td>
<td>417 (277)</td>
</tr>
<tr>
<td></td>
<td>32 (21)</td>
<td>11 (10)</td>
</tr>
<tr>
<td></td>
<td>13 (15)</td>
<td>27 (66)</td>
</tr>
<tr>
<td><strong>4. Birch St/Grant Ave</strong></td>
<td>247 (174)</td>
<td>259 (286)</td>
</tr>
<tr>
<td></td>
<td>127 (106)</td>
<td>366 (472)</td>
</tr>
<tr>
<td></td>
<td>484 (334)</td>
<td>633 (462)</td>
</tr>
<tr>
<td><strong>5. Birch St/Sherman Ave</strong></td>
<td>247 (174)</td>
<td>259 (286)</td>
</tr>
<tr>
<td></td>
<td>127 (106)</td>
<td>366 (472)</td>
</tr>
<tr>
<td></td>
<td>484 (334)</td>
<td>633 (462)</td>
</tr>
<tr>
<td><strong>6. Ash St/California Ave</strong></td>
<td>172 (166)</td>
<td>13 (28)</td>
</tr>
<tr>
<td></td>
<td>47 (17)</td>
<td>23 (30)</td>
</tr>
<tr>
<td><strong>7. El Camino Real/Cambridge Ave</strong></td>
<td>33 (68)</td>
<td>14 (26)</td>
</tr>
<tr>
<td></td>
<td>33 (122)</td>
<td>53 (130)</td>
</tr>
<tr>
<td><strong>8. El Camino Real/California Ave</strong></td>
<td>94 (129)</td>
<td>60 (85)</td>
</tr>
<tr>
<td></td>
<td>65 (87)</td>
<td>157 (220)</td>
</tr>
<tr>
<td><strong>9. El Camino Real/Page Mill Rd</strong></td>
<td>23 (52)</td>
<td>135 (202)</td>
</tr>
<tr>
<td></td>
<td>144 (177)</td>
<td>157 (220)</td>
</tr>
<tr>
<td><strong>10. Middlefield Rd/Oregon Expy</strong></td>
<td>23 (52)</td>
<td>135 (202)</td>
</tr>
<tr>
<td></td>
<td>144 (177)</td>
<td>157 (220)</td>
</tr>
</tbody>
</table>
The City is currently proposing a new Residential Preferential Parking (RPP) program in the Evergreen Park and Mayfield neighborhoods. This program would allow residents or employees in the Evergreen Park and Mayfield neighborhoods to purchase permits that would provide them with unrestricted parking on the streets. Vehicles parked on the residential streets without a permit would be subject to the signed time-limits and would be cited if they are parked beyond that period. In May 2016, City Council directed staff to proceed with the implantation of the RPP program.

EXISTING INTERSECTION LEVELS OF SERVICE

Existing intersection lane configurations, signal timings, and turning movement volumes were used to calculate the levels of service for the key intersections during each peak hour. The results of the LOS analysis using the TRAFFIX software program for Existing Conditions are presented in Table 4. Appendix C contains the corresponding LOS calculation sheets. The results of the LOS calculations indicate that all study intersections operate at acceptable service levels (LOS D or better for City intersections and LOS E or better for CMP intersections) during the AM and PM peak hours.

FIELD OBSERVATIONS

Field observations of the study intersections were conducted during the morning and evening peak periods in September 2016. The purpose of this effort was (1) to identify any existing traffic problems that may not be directly related to intersection LOS and (2) to identify any locations where the LOS calculation does not accurately reflect actual operations in the field. In most cases, the intersections were observed to operate at the calculated levels of service for each peak hour. However, in a few locations, a few differences were identified between the observed and calculated intersection operations.

El Camino Real serves heavy traffic volumes during both peak hours and long vehicle queues were observed in both the northbound and southbound directions. The El Camino Real and Page Mill Road intersection is very congested on all approaches during both peak periods.

During the PM peak hour, the southbound queue on El Camino Real vehicle queue can extend from Page Mill Road all the way past Stanford Avenue. The southbound queues on Cambridge Avenue, California Avenue, and Page Mill Road intersections on El Camino Real would need multiple cycles to clear the intersection. The northbound approach on El Camino Real and Page Mill Road also has long vehicle queues; however, the queues were observed to disperse more quickly than the southbound queues.

Page Mill Road/Oregon Expressway also experiences long vehicle queues during the peak periods at the El Camino Real intersection. The southbound queues on Page Mill Road can extend from El Camino Real to
Bryant Street during both AM and PM peak periods, and the northbound queue can extend as far back to the HP office driveway during the PM peak period.

**TABLE 4: EXISTING INTERSECTIONS LEVEL OF SERVICE**

<table>
<thead>
<tr>
<th>Intersection</th>
<th>Control¹</th>
<th>Peak Hour</th>
<th>Delay²</th>
<th>LOS³</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Park Boulevard / Sherman Avenue</td>
<td>SSSC</td>
<td>AM</td>
<td>10.3</td>
<td>B</td>
</tr>
<tr>
<td></td>
<td></td>
<td>PM</td>
<td>12.2</td>
<td>B</td>
</tr>
<tr>
<td>2 Park Boulevard / Page Mill Road</td>
<td>SSSC</td>
<td>AM</td>
<td>18.4</td>
<td>C</td>
</tr>
<tr>
<td></td>
<td></td>
<td>PM</td>
<td>15.1</td>
<td>C</td>
</tr>
<tr>
<td>3 Birch Street / Sherman Avenue</td>
<td>AWSC</td>
<td>AM</td>
<td>9.3</td>
<td>A</td>
</tr>
<tr>
<td></td>
<td></td>
<td>PM</td>
<td>8.6</td>
<td>A</td>
</tr>
<tr>
<td>4 Birch Street / Grant Street</td>
<td>AWSC</td>
<td>AM</td>
<td>13.1</td>
<td>B</td>
</tr>
<tr>
<td></td>
<td></td>
<td>PM</td>
<td>11.4</td>
<td>B</td>
</tr>
<tr>
<td>5 Birch Street / Sheridan Avenue</td>
<td>SSSC</td>
<td>AM</td>
<td>27.5</td>
<td>D</td>
</tr>
<tr>
<td></td>
<td></td>
<td>PM</td>
<td>16.9</td>
<td>C</td>
</tr>
<tr>
<td>6 Ash Street / California Avenue</td>
<td>AWSC</td>
<td>AM</td>
<td>8.1</td>
<td>A</td>
</tr>
<tr>
<td></td>
<td></td>
<td>PM</td>
<td>8.4</td>
<td>A</td>
</tr>
<tr>
<td>7 El Camino Real / Cambridge Avenue</td>
<td>Signal</td>
<td>AM</td>
<td>14.5</td>
<td>B</td>
</tr>
<tr>
<td></td>
<td></td>
<td>PM</td>
<td>17.0</td>
<td>B</td>
</tr>
<tr>
<td>8 El Camino Real / California Avenue</td>
<td>Signal</td>
<td>AM</td>
<td>21.6</td>
<td>C</td>
</tr>
<tr>
<td></td>
<td></td>
<td>PM</td>
<td>28.5</td>
<td>C</td>
</tr>
<tr>
<td>9 El Camino Real / Page Mill Road*</td>
<td>Signal</td>
<td>AM</td>
<td>60.1</td>
<td>E</td>
</tr>
<tr>
<td></td>
<td></td>
<td>PM</td>
<td>47.0</td>
<td>D</td>
</tr>
<tr>
<td>10 Middlefield Road / Oregon Expressway*</td>
<td>Signal</td>
<td>AM</td>
<td>49.7</td>
<td>D</td>
</tr>
<tr>
<td></td>
<td></td>
<td>PM</td>
<td>54.7</td>
<td>D</td>
</tr>
</tbody>
</table>

Notes:
1. SSSC = Side-Street-Stop Controlled; AWSC = All-Way-Stop Controlled
2. Whole intersection weighted average control delay expressed in second per vehicle for signalized intersections and all-way stop controlled intersections. Total control delay for the worst movement is presented for side-street stop controlled intersections. Signalized intersections include adjusted saturation flow rates to reflect Santa Clara County conditions per VTA guidelines.
3. LOS = Level of Service. LOS calculations conducted using the TRAFFIX level of service analysis software package, which applies the method described in the 2000 Highway Capacity Manual.

**Bold text** indicates deficient intersection operations.
* Denotes Congestion Management Program (CMP) intersection.
Source: Fehr & Peers, 2017
3.0 EXISTING PLUS PROJECT CONDITIONS

This chapter presents the impacts of the proposed Project on the surrounding roadway system under Existing plus Project Conditions. First, the method used to estimate the amount of traffic generated by the Project is described. Then, the results of the LOS calculations for Existing plus Project Conditions are presented. Existing plus Project Conditions are defined as Existing Conditions plus traffic generated by the proposed Project. A comparison of intersection operations under Existing plus Project and Existing Conditions is presented and the immediate-term impacts of the Project on the study intersections are discussed.

PROJECT TRAFFIC ESTIMATES

The proposed Project is located at the corner of Sherman Avenue and Birch Street, and would remove the existing surface parking lots (i.e. Lots C-6 and C-7) with a total of 310 spaces to construct a new three-story Public Safety Building (PSB) that would range in size between 45,000 to 50,000 square feet on Lot C-6 and, and a new public parking structure with approximately 460 to 640 parking spaces (i.e., 160 to 340 net new spaces). The maximum quantities of building area and parking spaces for the PSB and Parking Structure, respectively, were analyzed to provide a conservative analysis. A summary of the existing and proposed development on the Project site is shown in Table 5.

![Table 5: Existing and Proposed Development](image)

TRIP GENERATION ESTIMATES

The vehicle trip estimates for the proposed Public Safety Building (PSB) were developed based on trip generation studies for similar facilities conducted by Portland State University (PSU) and at the Central Police
The weekday PM peak hour rate is based on surveys conducted at four police stations in the Portland Metro Area, and average weekday and AM peak hour trip generation rates are based on surveys conducted in Vancouver. A 50/50 split for inbound and outbound trips was used for PSB-generated traffic. Appendix B contains the trip generation information for the described police stations.

Vehicle trip estimates for the net new parking spaces were estimated based on parking surveys conducted at the two existing parking lots (Lots C-6 and C-7) during the AM and PM peak periods. The parking surveys were used to determine the existing parking turnover rates. During the time the parking surveys were conducted, building construction immediately adjacent to the parking lots at 385 Sherman Avenue occurred, which resulted in some contractors parking in the two lots. The parking surveys and field observations revealed that during the AM peak period, a maximum of 10 percent of the total parking spaces in the two lots were occupied by contractors. Given the relatively low contractor parking occupancy, the contractor parking was included in the trip calculation to provide a conservative analysis.

The parking surveys were conducted on Wednesday, October 19, 2016 from 6:00 AM to 9:00 AM and 3:00 PM to 6:00 PM. The number of parked vehicles and the last four digits of each license plate were recorded once per hour to determine the timing of inbound and outbound trips. The total number of peak hour trips was divided by the total number of parking spaces to determine a trips/space rate. Table 6 shows the existing vehicle trip rates and the inbound and outbound split of the parking lots based on the surveyed rates. These parking rates were used to calculate the net new trips for the proposed parking structure.

### TABLE 6: VEHICLE TRIP RATES AT EXISTING PARKING LOTS

<table>
<thead>
<tr>
<th>Lot</th>
<th>Supply</th>
<th>AM</th>
<th>PM</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Rate</td>
<td>In %</td>
</tr>
<tr>
<td>C-6</td>
<td>162</td>
<td>0.11</td>
<td>88%</td>
</tr>
<tr>
<td>C-7</td>
<td>158</td>
<td>0.29</td>
<td>60%</td>
</tr>
<tr>
<td>OVERALL</td>
<td>310</td>
<td>0.19</td>
<td>67%</td>
</tr>
</tbody>
</table>

Source: Fehr & Peers, 2017

The parking structure is not expected to create a mode shift from non-auto modes to vehicles since the number of additional parking spaces is not that substantial. For example, if a person is currently biking to their destination in Evergreen Park, they will unlikely shift their transportation mode to driving just because the Project adds additional parking spaces. Therefore, the rates presented in Table 7 of the existing vehicle
trip rates are appropriate to use in this study since the parking structure is not expected to induce vehicle travel.

**TRIP GENERATION**

Table 7 summarizes the Project’s estimated trip generation. The proposed Project is estimated to generate 2,822 net new daily trips, 129 net new AM peak hour trips (74 inbound and 55 outbound), and 238 net new PM peak hour trips (116 inbound and 122 outbound).

### TABLE 7: PROJECT VEHICLE TRIP GENERATION ESTIMATES

<table>
<thead>
<tr>
<th>Land Use</th>
<th>Trip Generation Source</th>
<th>Quantity</th>
<th>Weekday</th>
<th>AM Peak Hour</th>
<th>PM Peak Hour</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Rate</td>
<td>Trips</td>
<td>Rate In</td>
</tr>
<tr>
<td>Public Safety Building</td>
<td>Supporting Studies²</td>
<td>50 ksf</td>
<td>29.74</td>
<td>1,487</td>
<td>1.48</td>
</tr>
<tr>
<td>Parking Structure (New Spaces Only)</td>
<td>Parking Surveys³</td>
<td>330 spaces</td>
<td>4.21</td>
<td>1,391</td>
<td>0.19</td>
</tr>
<tr>
<td><strong>TOTAL NET NEW TRIPS</strong></td>
<td></td>
<td></td>
<td>2,878</td>
<td>80</td>
<td>58</td>
</tr>
</tbody>
</table>

*Source: Fehr & Peers, 2017*

Notes:
1. ksf = 1,000 ksf
2. Portland State University (PSU) study of four existing police stations in the Portland metropolitan area, Fall 2009
3. Parking surveys conducted on lots C-6 and C-7 during the AM and PM peak periods. Daily parking surveys were not conducted, thus, assumed that the PM rate represents 10% of the daily.

**TRIP DISTRIBUTION AND ASSIGNMENT**

The direction of approach and departure of the Project trips were based on the locations of complementary land uses (e.g. areas of the City to be patrolled, PSB employee residential areas, existing police station), existing travel patterns in the area, and patterns used in other studies. The trip distribution pattern is shown in Figure 6. The general direction of approach and departure are listed in Table 8.

Given that parking facilities are not typically traffic generators by themselves, the trip distribution in Table 9 was only applied to the PSB-related trips. Trips are actually generated by the nearby retail, office and residential uses, and parking lots or structures simply provide vehicle storage. The Parking Structure trips are generally going to be existing vehicles that currently park at adjacent facilities (e.g. street parking, Lot C-8, etc.), but now park in the new Parking Structure. Therefore, the parking structure trips were only added to the adjacent intersections in the immediate vicinity of the site (i.e. Sherman Ave/Birch St [Int. 3], California.
Avenue/Ash Street [Int. 6], Sherman Ave/Ash St, and California Ave/Birch St) to account for the re-routing of the existing parking trips.

### TABLE 8: TRIP DISTRIBUTION

<table>
<thead>
<tr>
<th>Direction</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Middlefield Road north</td>
<td>7%</td>
</tr>
<tr>
<td>Middlefield Road south</td>
<td>8%</td>
</tr>
<tr>
<td>Oregon Expressway east</td>
<td>20%</td>
</tr>
<tr>
<td>Alma Street north</td>
<td>10%</td>
</tr>
<tr>
<td>Alma Street south</td>
<td>10%</td>
</tr>
<tr>
<td>El Camino Real north</td>
<td>15%</td>
</tr>
<tr>
<td>El Camino Real south</td>
<td>20%</td>
</tr>
<tr>
<td>Page Mill Road west</td>
<td>10%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

Source: Fehr & Peers, 2017

Project trips were assigned to the roadway network based on the trip distribution patterns discussed above. Figure 7 shows the AM and PM peak hour Project trips assigned to each turning movement at the study intersections. The trip assignment was added to the existing volumes to establish volumes under Existing plus Project Conditions, as shown in Figure 8.
Figure 6
Project Trip Distribution
Figure 7

Traffic Volumes and Lane Configurations
Project Trip Assignment - AM & PM Peak Hours
Figure 8
Traffic Volumes and Lane Configurations
Existing (2016) plus Project Conditions - AM & PM Peak Hours
EXISTING PLUS PROJECT INTERSECTION LEVELS OF SERVICE

Intersection LOS was calculated with the new traffic added by the proposed Project to evaluate intersections operating conditions of the and identify potential impacts to the roadway system. The results of the intersection LOS calculations for Existing plus Project Conditions are presented in Table 10. Appendix C contains the corresponding calculation sheets. The results for Existing Conditions are included for comparison purposes. Table 9 also reports the change in critical delay and critical volume-to-capacity (V/C) ratios. The changes in critical delay and critical V/C ratios between Existing and Existing plus Project Conditions are used to identify significant impacts.

The results of the LOS calculations indicate that all study intersections are projected to operate at acceptable service levels (LOS D or better for City intersections and LOS E or better for CMP intersections) during the AM and PM peak hours under Existing plus Project Conditions.

EXISTING PLUS PROJECT INTERSECTION IMPACTS AND MITIGATION MEASURES

This section of the report evaluates the intersection LOS results presented in Table 9 against the City of Palo Alto and VTA’s criteria for significant intersection impacts and presents mitigation measures for identified impacts.

Given that the LOS calculations indicate that all study intersections are projected to operate at acceptable service levels based on the City of Palo Alto and VTA’s criteria, the Project has a less-than-significant impact at all study intersections under the Existing plus Project scenario, and no traffic mitigation measures are needed.
TABLE 9: EXISTING WITH PROJECT INTERSECTIONS LEVEL OF SERVICE

<table>
<thead>
<tr>
<th>Intersection</th>
<th>Control</th>
<th>Peak Hour¹</th>
<th>Existing Conditions</th>
<th>Existing with Project Conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Delay² LOS³</td>
<td>Delay² LOS³ Δ in Crit. V/C⁴ Δ in Crit. Delay⁵</td>
</tr>
<tr>
<td>1 Park Boulevard / Sherman Avenue</td>
<td>SSSC</td>
<td>AM 10.3</td>
<td>B</td>
<td>10.5 B N/A – Unsignalized Intersection</td>
</tr>
<tr>
<td></td>
<td></td>
<td>PM 12.2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 Park Boulevard / Page Mill Road</td>
<td>SSSC</td>
<td>AM 18.4</td>
<td>C</td>
<td>18.6 C N/A – Unsignalized Intersection</td>
</tr>
<tr>
<td></td>
<td></td>
<td>PM 15.1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 Birch Street / Sherman Avenue</td>
<td>AWSC</td>
<td>AM 9.3</td>
<td>A</td>
<td>9.7 A N/A – Unsignalized Intersection</td>
</tr>
<tr>
<td></td>
<td></td>
<td>PM 8.6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4 Birch Street / Grant Street</td>
<td>SSSC</td>
<td>AM 13.1</td>
<td>B</td>
<td>13.5 B N/A – Unsignalized Intersection</td>
</tr>
<tr>
<td></td>
<td></td>
<td>PM 11.4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5 Birch Street / Sheridan Avenue</td>
<td>SSSC</td>
<td>AM 27.5</td>
<td>D</td>
<td>28.8 D N/A – Unsignalized Intersection</td>
</tr>
<tr>
<td></td>
<td></td>
<td>PM 16.9</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6 Ash Street / California Avenue</td>
<td>AWSC</td>
<td>AM 8.1</td>
<td>A</td>
<td>8.3 A N/A – Unsignalized Intersection</td>
</tr>
<tr>
<td></td>
<td></td>
<td>PM 8.4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7 El Camino Real / Cambridge Avenue</td>
<td>Signal</td>
<td>AM 14.5</td>
<td>B</td>
<td>14.4 B 0.001 0.0 0.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>PM 17.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8 El Camino Real / California Avenue</td>
<td>Signal</td>
<td>AM 21.6</td>
<td>C</td>
<td>22.3 C 0.007 1.0 0.6</td>
</tr>
<tr>
<td></td>
<td></td>
<td>PM 28.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9 El Camino Real / Page Mill Road*</td>
<td>Signal</td>
<td>AM 60.1</td>
<td>E</td>
<td>60.7 E 0.002 0.5 0.7 1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>PM 47.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10 Middlefield Road / Oregon</td>
<td>Signal</td>
<td>AM 49.7</td>
<td>D</td>
<td>49.9 D 0.007 0.5 0.4 0</td>
</tr>
<tr>
<td>Expressway*</td>
<td></td>
<td>PM 54.7</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Notes:
1. SSSC = Side-Street-Stop Controlled; AWSC = All-Way-Stop Controlled
2. Whole intersection weighted average control delay expressed in second per vehicle for signalized intersections and all-way stop controlled intersections. Total control delay for the worst movement is presented for side-street stop controlled intersections. Signalized intersections include adjusted saturation flow rates to reflect Santa Clara County conditions per VTA guidelines.
3. LOS = Level of Service. LOS calculations conducted using the TRAFFIX level of service analysis software package, which applies the method described in the 2000 Highway Capacity Manual.
4. Change in critical movement delay between Existing and Project Conditions for signalized intersections. N/A = Not applicable for unsignalized intersections.
5. Change in critical movement delay between Existing and Project Conditions for signalized intersections. N/A = Not applicable for unsignalized intersections.

Bold text indicates deficient intersection operations.
PEDESTRIAN, BICYCLE, AND TRANSIT IMPACTS AND MITIGATION

Project impacts to off-site pedestrian, bicycle, and transit facilities and services based on the criteria presented in Chapter 1 are discussed in this section. Project pedestrian, bicycle, and transit impacts regarding site access are discussed in Chapter 6: Site Access and On-Site Circulation.

The Project, particularly the PSB, will generate some new pedestrian and bicyclists. The site is located approximately 700 feet from the Caltrain California Avenue train station, and within 200 feet of two bus stops on California Avenue. Thus, the Project is expected to generate pedestrian demand that will require sidewalks or paths for safe and convenient travel to and from these destinations, as well as the retail, offices and service opportunities located on California Avenue and other streets. Existing sidewalks are provided adjacent to and near the Project site and could accommodate the additional pedestrians generated by the Project. In addition, crosswalks and pedestrian signals are provided at all signalized study intersections in the study area. Thus, the impact to pedestrian facilities is considered less-than-significant, and no mitigation measures are needed.

The Project is not expected to create a hazardous condition that currently does not exist for pedestrians and bicyclists, and would not interfere with pedestrian or bicycle accessibility to the site and adjoining areas. Bicycle travel around the site is on lower volume and lower speed streets, and therefore, it is more conducive to bicycling. Furthermore, the Project does not conflict with existing and planned bicycle facilities; thus, the impact to bicycle facilities is considered less-than-significant and no mitigation measures are needed.

The Project is expected to generate some new demand for transit services and facilities. The Project site is served by VTA and Stanford Marguerite bus stops located at the El Camino Real/Page Mill Road intersection and along California Avenue. The PSB portion of the proposed Project is estimated to generate a small number of new transit passengers, which would be distributed across multiple bus routes, shuttles, and Caltrain. Accordingly, the existing transit service is expected to accommodate the additional demand generated by the Project, and therefore, is expected to be less-than-significant.
4.0 BACKGROUND CONDITIONS

This chapter presents the results of the LOS calculations under Background Conditions with and without the Project. Traffic volumes for Background No Project Conditions comprise existing volumes plus traffic generated by “approved but not yet constructed” and “unoccupied” development near the site plus growth from development in the greater study area. Background plus Project Conditions are defined as Background No Project Conditions plus net new traffic generated by the proposed Project.

BACKGROUND NO PROJECT TRAFFIC VOLUMES

Staff from the City of Palo Alto provided a list of development projects in the study area that are expected to add traffic to the study intersections in the near future. Trip generation estimates were obtained from their respective traffic reports or estimated based on trip generation rates published in the Institute of Transportation Engineers Trip Generation (9th Edition). The trips for each of the background projects were then assigned to the roadway network based on population and employment data, existing and future travel patterns, and recent TIA’s completed in the area.

The approved projects include:

- 2555 Park Boulevard (23,269 square feet of office space)
- 2500 & 2600 El Camino Real (70 apartments, 6,253 square feet of retail, and 747 square feet of coffee shop)
- 2747 Park Boulevard (33,300 square feet of office)
- 3045 Park Boulevard (29,120 square feet of office)
- 385 Sherman Avenue (55,560 square feet of office and 4 dwelling units)
- 2515 & 2585 El Camino Real (13 Condominiums, 10,122 square feet of retail, 9,825 square feet of office)
- 2209 El Camino Real (2,000 square feet of walk-in bank, 3,400 square feet of office, 4 dwelling units)

Furthermore, an annual growth rate was applied to the through movements on El Camino Real to represent the increase in regional traffic from future developments outside of the study area. The El Camino Real annual growth rate was obtained from the City’s Travel Demand Model and applied to existing traffic counts to account for regional growth. This growth rate was compounded over five-year timeframe (2016 to 2021) up to full development of the proposed Project.
Figure 9 presents the AM and PM peak-hour turning movement volumes at the study intersections under this scenario.

BACKGROUND ROADWAY IMPROVEMENTS

The following study intersections are expected to be modified prior to completion of the proposed Project due to planned and funded improvements:

- Park Boulevard / Page Mill Road (Intersection #2) – New traffic signal.²

No other approved and funded transportation network improvements were identified that would be constructed and operational prior to Project completion. Figure 9 also presents the lane configurations and traffic control devices at the study intersections under this scenario.

BACKGROUND WITH PROJECT INTERSECTION VOLUMES

Trips generated from the proposed Project (Figure 6) were added to the Background traffic projects to develop traffic volumes for Background plus Project Conditions. The resulting volumes are shown on Figure 10.

BACKGROUND INTERSECTION LEVELS OF SERVICE

Table 10 presents the delay and LOS calculation results for the study intersections under Background No Project and Background plus Project Conditions. Appendix C contains the corresponding calculation sheets.

The El Camino Real/Cambridge Avenue intersection shows a reduction in average delay with the addition of Project traffic. This is because the average delay values presented in the table are intersection weighted averages. Weighted average delays will be reduced when traffic is added to a movement with a high volume and low to moderate delays, such as through movements on El Camino Real. Conversely, relatively small volume increase to movements with high delays can substantially increase the weighted average.

² Project improvement associated with 2747 Park Boulevard project.
Figure 8
Traffic Volumes and Lane Configurations
Existing (2016) plus Project Conditions - AM & PM Peak Hours
### Table

<table>
<thead>
<tr>
<th>Intersection</th>
<th>AM Peak Volumes</th>
<th>PM Peak Volumes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Traffic Volumes</strong></td>
<td><strong>Lane Configurations</strong></td>
<td></td>
</tr>
<tr>
<td><strong>1. Park Blvd/Sherman Ave</strong></td>
<td>15 (29)</td>
<td>18 (27)</td>
</tr>
<tr>
<td></td>
<td>9 (1)</td>
<td>6 (3)</td>
</tr>
<tr>
<td></td>
<td>1 (2)</td>
<td>0 (3)</td>
</tr>
<tr>
<td><strong>2. Park Blvd/Page Mill Rd</strong></td>
<td>12 (32)</td>
<td>55 (151)</td>
</tr>
<tr>
<td></td>
<td>7 (15)</td>
<td>19 (33)</td>
</tr>
<tr>
<td></td>
<td>22 (34)</td>
<td>8 (8)</td>
</tr>
<tr>
<td><strong>3. Birch St/Sherman Ave</strong></td>
<td>16 (34)</td>
<td>55 (64)</td>
</tr>
<tr>
<td></td>
<td>4 (8)</td>
<td>14 (19)</td>
</tr>
<tr>
<td><strong>4. Birch St/Grant Ave</strong></td>
<td>20 (34)</td>
<td>8 (8)</td>
</tr>
<tr>
<td></td>
<td>22 (34)</td>
<td>16 (21)</td>
</tr>
<tr>
<td><strong>5. Birch St/Sheridan Ave</strong></td>
<td>6 (7)</td>
<td>14 (35)</td>
</tr>
<tr>
<td></td>
<td>36 (36)</td>
<td>14 (118)</td>
</tr>
<tr>
<td><strong>6. Ash St/California Ave</strong></td>
<td>16 (18)</td>
<td>8 (8)</td>
</tr>
<tr>
<td></td>
<td>70 (80)</td>
<td>22 (22)</td>
</tr>
<tr>
<td><strong>7. El Camino Real/Cambridge Ave</strong></td>
<td>118 (199)</td>
<td>13 (28)</td>
</tr>
<tr>
<td></td>
<td>14 (35)</td>
<td>14 (118)</td>
</tr>
<tr>
<td><strong>8. El Camino Real/California Ave</strong></td>
<td>127 (237)</td>
<td>127 (237)</td>
</tr>
<tr>
<td></td>
<td>113 (203)</td>
<td>113 (203)</td>
</tr>
<tr>
<td><strong>9. El Camino Real/Page Mill Rd</strong></td>
<td>72 (76)</td>
<td>24 (71)</td>
</tr>
<tr>
<td></td>
<td>9 (1)</td>
<td>6 (7)</td>
</tr>
<tr>
<td><strong>10. Middlefield Rd/Oregon Expwy</strong></td>
<td>147 (129)</td>
<td>874 (1,108)</td>
</tr>
<tr>
<td></td>
<td>17 (17)</td>
<td>16 (26)</td>
</tr>
</tbody>
</table>

- **Traffic Volumes** represent the number of vehicles passing through the intersection during peak hours.
- **Lane Configurations** indicate the number of lanes available for traffic at the intersection.

---

**Figure 10**

Traffic Volumes and Lane Configurations

Background plus Project Conditions - AM & PM Peak Hours
## TABLE 10: BACKGROUND AND BACKGROUND PLUS PROJECT INTERSECTIONS LEVEL OF SERVICE

<table>
<thead>
<tr>
<th>Intersection</th>
<th>Control</th>
<th>Peak Hour</th>
<th>Background Conditions</th>
<th>Background plus Project Conditions</th>
<th>Δ in Crit. V/C</th>
<th>Δ in Crit. Delay</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>AM</td>
<td>Delay 2</td>
<td>LOS 3</td>
<td></td>
<td>Delay 2</td>
</tr>
<tr>
<td>1 Park Boulevard / Sherman Avenue</td>
<td>SSSC</td>
<td>AM</td>
<td>10.3</td>
<td>B</td>
<td>10.6</td>
<td>B</td>
</tr>
<tr>
<td></td>
<td></td>
<td>PM</td>
<td>12.4</td>
<td>B</td>
<td>13.4</td>
<td>B</td>
</tr>
<tr>
<td>2 Park Boulevard / Page Mill Road</td>
<td>Signal</td>
<td>AM</td>
<td>26.3</td>
<td>C</td>
<td>26.3</td>
<td>C</td>
</tr>
<tr>
<td></td>
<td></td>
<td>PM</td>
<td>27.2</td>
<td>C</td>
<td>28.4</td>
<td>C</td>
</tr>
<tr>
<td>3 Birch Street / Sherman Avenue</td>
<td>AWSC</td>
<td>AM</td>
<td>9.5</td>
<td>A</td>
<td>9.9</td>
<td>A</td>
</tr>
<tr>
<td></td>
<td></td>
<td>PM</td>
<td>8.7</td>
<td>A</td>
<td>9.6</td>
<td>A</td>
</tr>
<tr>
<td>4 Birch Street / Grant Street</td>
<td>SSSC</td>
<td>AM</td>
<td>14.1</td>
<td>B</td>
<td>14.6</td>
<td>B</td>
</tr>
<tr>
<td></td>
<td></td>
<td>PM</td>
<td>11.8</td>
<td>B</td>
<td>12.2</td>
<td>B</td>
</tr>
<tr>
<td>5 Birch Street / Sheridan Avenue</td>
<td>SSSC</td>
<td>AM</td>
<td>31.0</td>
<td>D</td>
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<td>D</td>
</tr>
<tr>
<td></td>
<td></td>
<td>PM</td>
<td>20.8</td>
<td>C</td>
<td>22.3</td>
<td>C</td>
</tr>
<tr>
<td>6 Ash Street / California Avenue</td>
<td>AWSC</td>
<td>AM</td>
<td>8.2</td>
<td>A</td>
<td>8.3</td>
<td>A</td>
</tr>
<tr>
<td></td>
<td></td>
<td>PM</td>
<td>8.5</td>
<td>A</td>
<td>8.8</td>
<td>A</td>
</tr>
<tr>
<td>7 El Camino Real / Cambridge Avenue</td>
<td>Signal</td>
<td>AM</td>
<td>14.1</td>
<td>B</td>
<td>14.1</td>
<td>B</td>
</tr>
<tr>
<td></td>
<td></td>
<td>PM</td>
<td>16.6</td>
<td>B</td>
<td>16.5</td>
<td>B</td>
</tr>
<tr>
<td>8 El Camino Real / California Avenue</td>
<td>Signal</td>
<td>AM</td>
<td>22.1</td>
<td>C+</td>
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<td>C+</td>
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<td>PM</td>
<td>28.5</td>
<td>C</td>
<td>29.2</td>
<td>C</td>
</tr>
<tr>
<td>9 El Camino Real / Page Mill Road*</td>
<td>Signal</td>
<td>AM</td>
<td>64.3</td>
<td>E</td>
<td>64.6</td>
<td>E</td>
</tr>
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<td></td>
<td></td>
<td>PM</td>
<td>48.9</td>
<td>D</td>
<td>49.3</td>
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<tr>
<td>10 Middlefield Road / Oregon</td>
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<td>AM</td>
<td>53.7</td>
<td>D-</td>
<td>54.0</td>
<td>D-</td>
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<tr>
<td>Expressway*</td>
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<td>PM</td>
<td>53.4</td>
<td>D-</td>
<td>53.7</td>
<td>D-</td>
</tr>
</tbody>
</table>

Notes:
1. SSSC = Side-Street-Stop Controlled; AWSC = All-Way-Stop Controlled
2. Whole intersection weighted average control delay expressed in second per vehicle for signalized intersections and all-way stop controlled intersections. Total control delay for the worst movement is presented for side-street stop controlled intersections. Signalized intersections include adjusted saturation flow rates to reflect Santa Clara County conditions per VTA guidelines.
3. LOS = Level of Service. LOS calculations conducted using the TRAFFIX level of service analysis software package, which applies the method described in the 2000 Highway Capacity Manual.
4. Change in critical movement delay between Background and Project Conditions. N/A = Not applicable for unsignalized intersections.
5. Bold text indicates deficient intersection operations.

* Denotes Congestion Management Program (CMP) intersection.

Source: Fehr & Peers, 2017
BACKGROUND INTERSECTION IMPACTS AND MITIGATION MEASURES

This section of the report evaluates the intersection LOS results presented in Table 10 against the City of Palo Alto and VTA’s criteria for significant impacts and presents mitigation measures for identified impacts.

Given that the LOS calculations indicate that all study intersections are projected to operate at acceptable service levels based on the City of Palo Alto and VTA’s criteria, the Project has a less-than-significant impact at all study intersections under the Background plus Project scenario, and no mitigation measures are needed.

PEDESTRIAN, BICYCLE, AND TRANSIT IMPACTS AND MITIGATION

The Project impact to pedestrian, bicycle, and transit facilities are discussed in the Existing plus Project Conditions Chapter, and similar results are expected under the Background plus Project scenario. While the Project is expected to generate new non-auto trips, the existing pedestrian, bicycle, and transit facilities could accommodate the anticipated additional demand. Furthermore, the City of Palo Alto Bicycle + Pedestrian Transportation Plan (May 2012), includes the identification of a bicycle boulevard on Park Boulevard. This Project does not conflict with that planned bicycle facility. Therefore, the Project’s impact to the pedestrian, bicycle, and transit facilities is considered less-than-significant, and no mitigation is needed.
5.0 CUMULATIVE CONDITIONS

This chapter presents the results of the intersection LOS calculations under Cumulative Conditions with and without the Project. Cumulative No Project Conditions are defined as existing volumes plus traffic generated by all foreseen development projects that would affect the transportation system in the study area, including “approved but not yet constructed”, as well as pending development projects that have not yet been approved. Cumulative with Project Conditions are defined as Cumulative without Project Conditions plus traffic generated by the proposed Project.

CUMULATIVE NO PROJECT TRAFFIC VOLUMES

Traffic projections for Cumulative Conditions were estimated based on the City’s Travel Demand Forecasting Model (TDFM), which uses land use and socioeconomic attributes in Traffic Analysis Zones (TAZs) to generate and assign traffic across the roadway network. This model accounts for traffic growth both in the City and in the greater Peninsula region. Per the City’s direction, the future year model with the Comprehensive Plan’s Scenario 1, “Business as Usual”, land use was used to estimate future year growth. According to the Comprehensive Plan Update Final EIR (August 30, 2017), which was adopted by City Council in November 2017, the “business as usual” scenario reflects the results if the City continued to operate under the existing Comprehensive Plan with no changes to goals and/or policies. Compared to the Preferred Scenario, Scenario 1 has slightly lower new housing unit projections (i.e. approximately 825 to 1,700 units), but higher new employment projections (i.e. 3,980 to 5,630 employees) in the City by 2030. Table 2-4 in the Final EIR states that Scenario 1 would have the highest transportation impacts of all the six scenarios. Consequently, using the Scenario 1 land uses to forecast the Cumulative traffic volumes would provide a more conservative analysis for this study. If another scenario with higher housing unit projections were to be used to forecast the volumes, it is not likely to substantially change the traffic forecasts estimates and/or conclusions because 1) the Mayfield Neighborhood is relatively built out, so any new housing development within the neighborhood is not anticipated to be significantly large in size, and 2) the roadway grid system provides multiple connections and access to the major regional roadways (e.g. El Camino Real, Page Mill Road, etc.) so traffic is better dispersed onto multiple local streets.

Annual growth factors from the TDFM were obtained for the following key roadways in the study area: Page Mill Road, Oregon Expressway, El Camino Real, California Avenue, Park Boulevard, and Middlefield Road. The annual growth rates ranged from 0.5 to 2 percent, with the highest growth on Middlefield Road and the lowest on California Avenue. The model network is not detailed enough to include local roadways (e.g. Sherman Avenue, Ash Street, Sheridan Avenue, etc.), so an annual growth rate of one (1) percent was applied.
for those roadways. This growth rate is considered reasonable given the urban and dense nature of the adjacent areas and surrounding neighborhoods. The annual growth factors were applied to the existing traffic volumes collected in September 2016 and was compounded over a 19-year timeframe (2016 to 2035).

Figure 11 presents the AM and PM peak-hour turning movement volumes at the study intersection under Cumulative No Project Conditions.

CUMULATIVE ROADWAY IMPROVEMENTS

The following approved and funded improvements are included at the study intersections under Cumulative Conditions:

- Park Boulevard / Page Mill Road (Intersection #2) – New traffic signal.\(^3\)
- El Camino Real / Page Mill Road (Intersection #9) – The addition of a westbound right-turn lane.\(^4\)

No other approved and funded transportation network improvements were identified that would be constructed under Cumulative Conditions.

CUMULATIVE PLUS PROJECT TRAFFIC VOLUMES

Trips generated from the proposed Project (Figure 6) were added to the Cumulative No Project traffic projections (Figure 11) to develop traffic volumes for Cumulative plus Project Conditions. The resulting volumes are shown in Figure 12.

CUMULATIVE INTERSECTION LEVELS OF SERVICE

Table 11 presents the level of service calculations for the study intersection under Cumulative No Project and Cumulative plus Project Conditions. Appendix C contains the corresponding calculation sheets.

The results indicate that all study intersections are projected to operate at acceptable service levels during the AM and PM peak hours, except for the Birch Street/Sheridan Avenue intersection, where the side-street approach is anticipated to operate at unacceptable LOS E during the AM peak hour.

\(^3\) Project Improvement associated with 2747 Park Boulevard project.
\(^4\) City of Palo Alto – California Avenue Streetscape project.
Figure 11
Traffic Volumes and Lane Configurations
Cumulative (2035) Conditions - AM & PM Peak Hours
Figure 12
Traffic Volumes and Lane Configurations
Cumulative plus Project Conditions - AM & PM Peak Hours
## TABLE 11: CUMULATIVE AND CUMULATIVE PLUS PROJECT INTERSECTIONS LEVEL OF SERVICE

<table>
<thead>
<tr>
<th>Intersection</th>
<th>Control</th>
<th>Peak Hour</th>
<th>Cumulative Conditions</th>
<th>Cumulative plus Project Conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Delay&lt;sup&gt;2&lt;/sup&gt;</td>
<td>LOS&lt;sup&gt;3&lt;/sup&gt;</td>
</tr>
<tr>
<td>1 Park Boulevard / Sherman Avenue</td>
<td>SSSC</td>
<td>AM</td>
<td>12.1</td>
<td>B</td>
</tr>
<tr>
<td></td>
<td></td>
<td>PM</td>
<td>13.6</td>
<td>B</td>
</tr>
<tr>
<td>2 Park Boulevard / Page Mill Road</td>
<td>Signal</td>
<td>AM</td>
<td>28.6</td>
<td>C</td>
</tr>
<tr>
<td></td>
<td></td>
<td>PM</td>
<td>36.8</td>
<td>D+</td>
</tr>
<tr>
<td>3 Birch Street / Sherman Avenue</td>
<td>AWSC</td>
<td>AM</td>
<td>10.1</td>
<td>B</td>
</tr>
<tr>
<td></td>
<td></td>
<td>PM</td>
<td>9.3</td>
<td>A</td>
</tr>
<tr>
<td>4 Birch Street / Grant Street</td>
<td>SSSC</td>
<td>AM</td>
<td>15.6</td>
<td>C</td>
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<tr>
<td></td>
<td></td>
<td>PM</td>
<td>12.6</td>
<td>B</td>
</tr>
<tr>
<td>5 Birch Street / Sheridan Avenue</td>
<td>SSSC</td>
<td>AM</td>
<td>43.7</td>
<td>E</td>
</tr>
<tr>
<td></td>
<td></td>
<td>PM</td>
<td>30.4</td>
<td>D</td>
</tr>
<tr>
<td>6 Ash Street / California Avenue</td>
<td>AWSC</td>
<td>AM</td>
<td>8.5</td>
<td>A</td>
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<td></td>
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<td>9.0</td>
<td>A</td>
</tr>
<tr>
<td>7 El Camino Real / Cambridge Avenue</td>
<td>Signal</td>
<td>AM</td>
<td>15.1</td>
<td>B</td>
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<tr>
<td></td>
<td></td>
<td>PM</td>
<td>18.7</td>
<td>B-</td>
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<td>8 El Camino Real / California Avenue</td>
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<td>9 El Camino Real / Page Mill Road*</td>
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<td>10 Middlefield Road / Oregon Expressway*</td>
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<td></td>
<td></td>
<td>PM</td>
<td>61.8</td>
<td>E</td>
</tr>
</tbody>
</table>

**Notes:**
1. **SSSC** = Side-Street-Stop Controlled; **AWSC** = All-Way-Stop Controlled
2. Whole intersection weighted average control delay expressed in second per vehicle for signalized intersections and all-way stop controlled intersections. Total control delay for the worst movement is presented for side-street stop controlled intersections. Signalized intersections include adjusted saturation flow rates to reflect Santa Clara County conditions per VTA guidelines.
3. LOS = Level of Service. LOS calculations conducted using the TRAFFIX level of service analysis software package, which applies the method described in the 2000 Highway Capacity Manual.
4. Change in critical movement delay between Cumulative and Project Conditions. N/A = Not applicable for unsignalized intersections.
5. Change in critical movement delay between Cumulative and Project Conditions. N/A = Not applicable for unsignalized intersections.

**Bold text** indicates deficient intersection operations according to agency standards.

* Denotes Congestion Management Program (CMP) intersection.

Source: Fehr & Peers, 2017
SIGNAL WARRANT ANALYSIS

As noted in Table 11, the Birch Street / Sheridan Avenue intersection is projected to operate unacceptably and would be impacted with the addition of traffic from the proposed Project. To determine if the potential impact is significant, the peak-hour signal warrant from the Manual of Uniform Traffic Control Devices (MUTCD) was evaluated for this location to determine if a traffic signal may be warranted. Application of the MUTCD criteria shows that the peak hour warrant is not met at the Birch Street / Sheridan Avenue intersection under Cumulative plus Project Conditions.

CUMULATIVE INTERSECTION IMPACTS AND MITIGATION MEASURES

This section of the report evaluates the intersection LOS results presented in Table 11 against the City of Palo Alto and VTA’s criteria for significant impacts and presents mitigation measures for identified impacts.

As discussed above, the results of the LOS calculations indicate that all study intersection would operate at acceptable service levels under Cumulative plus Project Conditions, except the Birch Street/Sheridan Avenue intersection, which operates at LOS E in the AM peak hour without and with the Project. However, while the intersection is anticipated to operate unacceptably, the unsignalized intersection does not satisfy the signal warrant. It is not uncommon for one or more approaches at an unsignalized intersection to operate at LOS E or F without meeting the warrant criteria for a signal. Therefore, based on the City of Palo Alto’s criteria, the Project has a less-than-significant impact at all study intersections under the Cumulative plus Project Condition at all intersections, and no mitigation measures are needed.

PEDESTRIAN, BICYCLE, AND TRANSIT IMPACTS AND MITIGATION

The Project impact to pedestrian, bicycle, and transit facilities are discussed in the Existing plus Project Conditions Chapter, and similar results are expected under the Cumulative plus Project scenario. While the Project is expected to generate new non-auto trips, the existing pedestrian, bicycle, and transit facilities could accommodate the additional demand. Furthermore, the City of Palo Alto Bicycle + Pedestrian Transportation Plan (May 2012), includes the identification of a bicycle boulevard on Park Boulevard. This Project does not conflict with that planned bicycle facility. Therefore, the Project’s impact to the pedestrian, bicycle, and transit facilities is considered less-than-significant and no mitigation is needed.
6.0 SITE ACCESS AND ON-SITE CIRCULATION

This chapter analyzes site access and internal circulation for vehicles, pedestrians, bicycles, and transit based on the site plans presented on Figures 2a and 2b. The PSB site plan shows the location of the Project driveways, but not the internal circulation system for auto, pedestrian, and bicycle traffic. The final Parking Structure site plan was being developed during the time of this study; therefore, due to the lack of a detailed site plan, more specific site circulation could not be evaluated. However, Fehr & Peers coordinated with the parking structure designers, Watry Design, Inc., to determine the ideal location for the parking structure driveway. Below is more detail on the access and circulation for the PSB and Parking Structure.

SITE ACCESS AND CIRCULATION

**Public Safety Building (PSB)**

The PSB site plan, developed by Ross Drulis Cusenbery Architecture, presents three access points to the site:

- **Primary inbound/outbound driveway on Sherman Avenue** – This driveway would be located approximately 85 feet west of Park Avenue and would provide access to the below-grade parking.

- **Secondary inbound/outbound driveway on Birch Street** – This driveway would be located immediately adjacent to the Jacaranda Lane alley driveway. This adjacent driveway configuration would result in potential turning movement conflicts for the vehicles leaving the Project driveway or Jacaranda Lane. For example, if a vehicle is trying to turn right out of the Project driveway while another vehicle on Jacaranda Lane is trying to turn left, the two vehicles could potentially conflict due to the close proximity and potential confusion over vehicle right-of-way. Portions of the existing median on Birch Street would need to be removed to allow left-turns out of the Project driveway.

  - **Recommendation:** Prohibit left-turns out of the Jacaranda Lane alley and provide full-access at the Project’s gated driveway. The vehicles on Jacaranda Lane that are destined for areas to the south would need to circulate around the block onto California Avenue, then Ash Street to access their southern destination. With the removal of the on-site parking lots as part of the Project, the volumes on Jacaranda Lane would be substantially reduced and the restricted left-turn movement would only affect a small number of vehicles.
Public Parking Structure

The parking structure would consist of five-to-six-levels total: three-to-four levels above grade and one-to-two basement floors. The parking structure internal ramps would be on the north side with access to the up ramp on the west and the down ramp on the east side.

The structure would be supported by one full access driveway on Sherman Avenue, approximately 90 feet to center of ram west from the corner of Birch Street. Similar to the PSB primary driveway, having the driveway closer to the adjacent east intersecting street (i.e. Park Boulevard for the PSB driveway and Birch Street for the Parking Structure Driveway) reduces the potential for queue spillback into the adjacent intersections (i.e. Birch Street and Ash Street). For an eastbound vehicle on Sherman Avenue trying to turn left into the structure, they must yield to westbound traffic, but they would have ample queuing storage on Sherman Avenue to make the movement without impeding traffic on Ash Street. For a westbound vehicle on Sherman Avenue that needs to turn right into the structure, they are not required to stop for conflicting movements (except for pedestrians walking on the sidewalk crossing the parking structure driveway), so the queues would be negligible.

If the parking structure is operated with a payment system, gates may be required at the entrance where each driver would receive a ticket upon entering. As discussed in the trip generation section, the parking structure is anticipated to generate approximately 116 inbound trips in the PM peak hour, which would equate to an average of approximately two vehicles per minute entering the structure. Even at the maximum anticipated queue of twice the average or four vehicles, the gating the entrance to the parking structure is not anticipated to adversely affect operations given the ample capacity available on Sherman Avenue.

Recommendations:

As the site plan refinements proceed, the following recommendations should be considered to enhance the vehicle circulation and reduce vehicle conflicts in the parking structure:

- The parking layout should avoid perpendicular parking spaces at the end of the aisles so that drivers can back in and out of the space easily and reduce potential conflicts.
- Stripe all driveways with double yellow centerline to delineate the separation of entering and exiting traffic.
PEDESTRIAN AND BICYCLE ACCESS AND CIRCULATION

Pedestrian

The Project site is supported by sidewalks on all adjacent roadways, except along Jacaranda Lane, which is an alley and will primarily serve only delivery trucks and police vehicles once the Project is built and operational. The Project site is adjacent to multiple restaurants and retail shops on California Avenue, and it is expected that PSB employees and people parking in the structure will walk to California Avenue to eat, shop or obtain services. Currently, two pedestrian walkways between buildings connect California Avenue to Jacaranda Lane, and would provide direct access to the PSB and Parking Structure.

Recommendations:

As the site plan refinements proceed, the following recommendations should be considered to enhance the pedestrian circulation and reduce conflicts in the parking structure:

- The Parking Structure will include stairwells on the northeast and northwest corners of the structure, adjacent to Jacaranda Lane. A clear pedestrian crosswalk should be provided on Jacaranda Lane to connect patrons between the structure to the walkway to California Avenue.

- Pedestrian and vehicle conflicts could potentially occur at Project driveways, when a car is exiting and pedestrians using the sidewalk that crosses the driveway. To enhance safety for pedestrians, it is recommended that signage and/or warning systems be installed at the entry/exit point of the parking garage (both on Sherman Avenue for the Parking Structure, the Birch Street gated driveway for the PSB, and the Jacaranda Lane gated driveway for the police department vehicles) to alert motorists of potential pedestrian conflicts. These signs or systems should also inform pedestrians that they should exercise caution when crossing the driveway.

Bicycles

PAMC Section 18.52.040 stipulates that one bicycle parking space per 2,500 feet of gross floor area is required with a mix of 80 percent for long-term parking and 20 percent for short-term parking. As a result, the PSB would need to provide 18 parking spaces for bikes (14 long-term bike spaces and 4 short-term spaces). These spaces should be conveniently located at building entrances or in visible areas for guests and employees. The applicant should ensure the following measures are integrated into the final site design:
• Class I long-term bicycle parking such as lockers or secured room be provided for employee use and long-term parking.
• Inverted u-style bicycle parking be provided for the bicycle racks for short-term parking.

In addition, PAMC Section 18.54.060 requires signs be posted at the building entrance to direct cyclists to parking facilities. Where feasible, we recommend that Manual on Uniform Traffic Control Devices (MUTCD) signage standards are followed.

TRANSIT ACCESS

The Project is located adjacent to existing transit lines and bus stops operating along El Camino Real, California Avenue, Page Mill Road-Oregon Expressway, and Caltrain railroad. While the increase in passenger demand may not exceed capacity, it is recommended that signage be provided at the PSB entrance indicating the direction of bus stops or coordinated wayfinding with the Caltrain Station. Signage could be placed on or adjacent to the Park Structure, as appropriate.

PARKING REQUIREMENTS

The PSB would provide between 170 to 190 underground spaces for police vehicles and staff. Visitor parking for the PSB will be available in the Project’s new parking structure across the street. According to Section 18.52.040 (parking supply) and 18.54.030 (accessible parking supply) of the City’s Municipal Code, the parking requirement for office uses is one space per 250 gross floor area. As a result, the PSB is required to supply 179 regular parking spaces and 6 accessible parking spaces, which equates to 185 total parking spaces. Accordingly, if the PSB provides the maximum proposed spaces (i.e. 190 spaces), it would provide sufficient on-site parking spaces to meet the City’s parking supply requirements.
7.0 OTHER TRANSPORTATION CONSIDERATIONS

This chapter presents a variety of other information relating to neighborhood impacts, vehicle miles of travel, and left-turn queues at key study intersections.

NEIGHBORHOOD IMPACTS

Since the proposed Project is located in the Mayfield neighborhood, it would add some Project trips to the residential streets, such as Birch Street and Park Boulevard. It is estimated that trips associated with the PSB would add a maximum of 40 trips during the PM peak hour on Birch Street between Sheridan Avenue and Oregon Expressway. Given that Birch Street is uncontrolled along this segment, the minimal traffic volume increase related to the Project would result in nominal increase in traffic delay on Birch Street.

Additionally, the El Camino Real/Page Mill Expressway would increase in average delay as a result of the Project. However, the increase would be negligible (i.e. less than 2 seconds) and is not expected to result in any new cut-through traffic in the Mayfield neighborhood or in the adjacent neighborhoods (i.e. College Terrace, Evergreen Park, and Ventura.

VEHICLE MILES TRAVELED (VMT)

This section describes the methodology used to calculate the average weekday Vehicle Miles of Travel (VMT) associated with the proposed Project. VMT is presented for informational purposes in this study. However, the values shown here are typically used as inputs to other technical studies such as air quality and greenhouse gas emissions.

VMT is considered a useful metric in understanding the overall impacts of a project on the transportation system. VMT is often expressed on a per unit basis “per capita” or “per employee” basis to understand the relative efficiency of one project versus another. By definition, one VMT occurs when a single vehicle is driven one mile. The VMT for a new development project is estimated by adding the VMT for all vehicles generated by a site or use. In addition, the VMT values in this report represent vehicular miles of travel for an entire weekday. Lastly, VMT values in this report represent the full length of a given trip, and are not truncated at city, county, or region boundaries.

VMT was only calculated for the PSB and not the Parking Structure. As described in the Trip Generation Estimates section, parking facilities are not typically traffic generators by themselves. Trips are actually
generated by the nearby retail, office and residential uses, and parking lots or structures simply provide vehicle storage. The Parking Structure “trips” are going to be made by existing vehicles that currently park at adjacent facilities (e.g. adjacent street parking or parking lots) but would now park in the new structure. Consequently, the Parking Structure would at worst generate a negligible amount of VMT, and it is likely that it would actually reduce VMT in the area since it will reduce the need for vehicles to circulate around the study area trying to find an available parking space on the street. Furthermore, since the PSB portion of the Project would relocate employees from the existing PSB in downtown to the new location on Sherman Avenue, the Project is not expected to generate significant additional regional trips, rather redistribute them to a new location within the City.

TRIP LENGTH DATA SOURCE

Many factors affect travel behavior, such as density, diversity of land uses, design of the transportation network, distance to high-quality transit, and demographics (the “D”s). Typically, low-density development at great distance from other land uses, located in areas with poor access to transit, generate more automobile travel compared to development located in urban areas.

VMT measurement has one primary limitation: it is not directly observed and therefore cannot be easily measured. The amount of VMT can be estimated based on extensive surveys of residents, visitors, and employees, or by using a validated travel demand model that estimates vehicle demand and identifies the origin and destination of every trip (providing the travel distance for each trip). Travel demand model estimation is typically only done for larger-scale projects than the proposed PSB/Parking Structure project.

To estimate the VMT for this project we used the data from the 2013 California Household Travel Survey [CHTS], which provides average trip lengths by trip purpose and geographic area, or regional travel demand model’s trip lengths to calculate a project’s VMT. Based on the CHTS, home based work trips for employees within the applicable census tract in Palo Alto is 9.6 miles.

VMT ESTIMATES

The VMT was calculated for years 2020 and 2040, which are the two future years of the MTC MPO Travel Demand Model. It is estimated that the PSB will have 160 employees. Assuming that each employee travels to and from work once a day (i.e. a one trip per direction or two total trips) and that on average you have an absenteeism of five percent to account for vacation, sick-time, other commitments, then the total year 2020 VMT for the PSB is 2,918 miles (160 employees x 9.6 miles x 2 trips x 95% = 2,918 miles of travel). Normalizing the VMT by employee, then the 2020 VMT per employee is 18.2 miles (2918 miles /160 employees = 18.2 miles/employee).
Based on available data from the VTA travel demand model, home based work trip VMT between the years 2013 and 2030 will increase by three percent from 9.11 miles to 9.41 miles. Assuming the same trend for the trip length data from the CHTS, then the year 2040 trip length would be 9.9 miles (9.7 miles x 1.03 = 9.9 miles). Applying the same VMT calculation assumptions as for 2020, then the 2040 VMT for the PSB is 3,015 miles (160 employees x 9.9 miles x 2 trips x 95% = 3,015 miles of travel). Normalizing the VMT by employee, then the 2040 VMT per employee is 18.2 miles (2918 miles /160 employees = 18.8 miles/employee).

SENATE BILL (SB) 743 ASSESSMENT

On September 27, 2013, Governor Jerry Brown signed SB 743 into law, starting a process that is expected to fundamentally change the way transportation impact analysis is conducted under CEQA. Within the State’s CEQA Guidelines, these changes will include elimination of auto delay, level of service (LOS), and similar measurements of vehicular roadway capacity and traffic congestion as the basis for determining significant transportation impacts. Since the adoption of SB 743, the Office of Planning and Research (OPR) has been working on guidelines and regulations to implement SB 743 and the required shift to VMT as the criterion for transportation impacts under CEQA. In November 2017, OPR released proposed new regulations (amendments to the State CEQA Guidelines\(^5\)) and provided recommendations for updating the State’s CEQA Guidelines in response to SB 743 and contained recommended specifications for VMT analysis in an accompanying “Technical Advisory on Evaluating Transportation Impacts in CEQA” (“Technical Advisory”).

OPR’s Technical Advisory contains specifications for VMT analysis methodology and recommendations for significance thresholds. The OPR Guidance contains sufficient information to inform lead agencies about how to prepare for the upcoming transition to VMT. However, the final implementation steps for SB 743 have not yet been completed and, therefore, implementation of SB 743 is not required until July 1, 2019.

In January 2018, the California Natural Resources Agency released the proposed CEQA Guidelines rulemaking materials for section 15064.3 (Determining the Significance of Transportation Impacts). Pending expected adoption in mid-2018, the proposed new CEQA Guidelines are currently scheduled to apply statewide on July 1, 2019.

As noted above, the results of this analysis are for informational purposes because the City has yet to adopt VMT thresholds; therefore, there is no formal significance criteria set for the VMT analysis. However, to understand the Project’s contribution to the transportation network, the OPR’s Technical Advisory

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\(^5\) The State CEQA Guidelines are found at California Code of Regulations, title 14, section 15000 et seq.
recommendations was used. OPR’s Technical Advisory on Evaluating Transportation Impacts in CEQA identifies the following significance criteria to assess VMT:

1. The Project will be considered to result in a significant impact to VMT if project-related VMT exceeds the following numeric thresholds:
   - **Workers Per Capita VMT**: A project exceeding a level of 15 percent below existing regional VMT per employee.

**VMT Impact Results**

For this analysis, VMT per employee results were compared to the Project Transportation Analysis Zone (TAZ) from the Metropolitan Transportation Commission (MTC) and the Association of Bay Area Governments (ABAG) regional model. Existing VMT data by TAZ was not available, so the Projected VMT estimates for Year 2020 and 2040 were used.

<table>
<thead>
<tr>
<th>Land Use (VMT per Capita)¹</th>
<th>Bay Area</th>
<th>Project</th>
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<tr>
<td></td>
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<tr>
<td></td>
<td>Regional Average</td>
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<tr>
<td>Employee</td>
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</tr>
</tbody>
</table>

¹ MTC Model results at analytics.mtc.ca.gov/foswiki/Main/PlanBayAreaVmtPerWorker and accessed in June 2017.

As shown in *Table 12*, the average trip length for employees at the proposed Project is estimated to be more than 15 percent below the regional averages. Therefore, the proposed Project’s VMT impact would result in less-than-significant impacts assuming the California Natural Resources Agency rulemaking in regards to SB 743 were in effect (currently anticipated for July 1, 2019).

It should be noted that a VMT analysis under the OPR’s proposed November 2017 guidelines and the January 2018 California Natural Resources Agency’s proposed rulemaking would likely not be required for the PSB. Per the Metropolitan Transportation Commission (MTC), the PSB is within its 2017 Transit Priority Areas⁶ (TSP) (generally within one-half mile of either an existing major transit stop or a stop along an existing high-quality transit corridor). The January 2018 California Natural Resources Agency draft rulemaking recommends that projects within a TSP should be presumed to cause a less than significant transportation

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⁶ MTC, 2017 Transit Priority Project Eligible Area.
impact and that they would not require a transportation impact assessment or VMT analysis under CEQA Guidelines § 15064.3(b)(1).

QUEUING ANALYSIS

The addition of Project traffic along the roadway network has the potential to add vehicles to left-turn movements causing the left-turn queue to exceed the turn pocket storage length. Queues that exceed the turn pocket storage length have the potential to impede through traffic movement along an approach. Potentially affected signalized intersections were selected for this evaluation based on where the Project would add at least five (5) vehicles to a study intersection with a left-turn pocket, which include the following three movements at two intersections:

- Int. 8  El Camino Real/California Avenue – Westbound left-turn pocket
- Int. 9  El Camino Real/Page Mill Road – Southbound left-turn pocket
- Int. 9  El Camino Real/Page Mill Road – Westbound left-turn pocket

The 95th percentile queues from the TRAFFIX LOS analysis (Appendix B) was used to evaluate the projected queues at the identified left-turn movements. The results of the left-turn queue analysis are presented in Table 13.

For purposes of this analysis, operational deficiencies were considered to occur under conditions where Project traffic causes the queue in a left turn pocket to extend beyond the turn pocket length by 25 feet or more (i.e., the length of one vehicle). Where the vehicle queue already exceeds the turn pocket storage under No Project conditions, a queuing deficiency would occur if Project traffic extends the queue by 25 feet or more.

Based on the queue analysis presented in Table 13, the southbound and westbound left turn pockets at El Camino Real/Page Mill Road are projected to serve queues that exceed capacity under Cumulative Conditions without and with the Project. However, the addition of Project trips for this movement would not extend the queue more than the No Project Conditions, so there would be no queuing deficiency considered at the El Camino Real/Page Mill Road intersection.

The southbound left-turn pocket at El Camino Real/California Avenue is also expected to exceed the available storage under Existing, Background, and Cumulative Conditions without and with the Project. Under Existing and Background Conditions, the southbound queue remains the same without and with the Project, so there would be no queuing deficiency for those two scenarios. Under Cumulative Conditions, the southbound left-turn queue increases by one vehicle (less than 25 feet increase), which is considered as
a deficiency under Cumulative Plus Project Conditions. However, this increase in queue length is insignificant and could likely be accommodated by adjusting the signal timings and/or the signal phases.
## TABLE 13: LEFT-TURN QUEUES

<table>
<thead>
<tr>
<th>Intersection</th>
<th>Pocket</th>
<th>Available Pocket Length (feet)</th>
<th>Peak Hour</th>
<th># of Trips Added</th>
<th>Projected Queue Length (feet)&lt;sup&gt;3&lt;/sup&gt;</th>
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<td>Background</td>
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<td></td>
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<td>No Project</td>
<td>Plus Project</td>
<td>No Project</td>
</tr>
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<td>135</td>
<td>AM</td>
<td>6</td>
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<td>125</td>
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<td></td>
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<td>175</td>
<td>175</td>
<td>200</td>
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<td>200</td>
</tr>
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<td>9 El Camino Real / Page Mill Road</td>
<td>SBL¹</td>
<td>700</td>
<td>AM</td>
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Notes:
1. SBL has two lanes; each lane has 350 feet of storage, so the total pocket length is 700 feet.
2. Each vehicle in queue is assumed to occupy 25 feet.
   **Bold** indicates the queue exceeds the storage length.

APPENDIX A: TRAFFIC COUNTS
# Traffic Data Service

San Jose, CA  
(408) 622-4787  
tdsbay@cs.com

File Name : 1AM FINAL  
Site Code : 00000001  
Start Date : 9/27/2016  
Page No : 1

## Groups Printed- Vehicles

<table>
<thead>
<tr>
<th>Start Time</th>
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<th>Left Peds</th>
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<th>Left Thru</th>
<th>Left Peds</th>
<th>App. Total</th>
<th>Right Thru</th>
<th>Left Thru</th>
<th>Left Peds</th>
<th>App. Total</th>
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<th>Left Thru</th>
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## Peak Hour for Entire Intersection Begins at 07:45 AM

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### Grand Total

- **BRYANT ST** Southbound: 156 15 65 14 250
- **OREGON EXPY** Westbound: 19 3384 13 14 3330
- **BRYANT ST** Northbound: 15 15 101 0 131
- **OREGON EXPY** Eastbound: 24 2182 34 0 2240

### Approach %

- **BRYANT ST** Southbound: 62.4 6 26 5.6 0.4
- **OREGON EXPY** Westbound: 0.6 98.6 0.4 0.4
- **BRYANT ST** Northbound: 11.5 11.5 77.1 0 0.4
- **OREGON EXPY** Eastbound: 1.1 97.4 1.5 0

### Total %

- **Approach %**: 2.6 0.3 1.1 0.2 4.2
- **Total %**: 0.3 0.3 1.7 0 2.2

### PHF

- **BRYANT ST** Southbound: 0.721
- **OREGON EXPY** Westbound: 0.417
- **BRYANT ST** Northbound: 0.938
- **OREGON EXPY** Eastbound: 0.786

---

Traffic Data Service
San Jose, CA  
(408) 622-4787  
tdsbay@cs.com
### Traffic Data Service

San Jose, CA

(408) 622-4787
tdsbay@cs.com

---

File Name: 1AM FINAL  
Site Code: 00000001  
Start Date: 9/27/2016  
Page No: 1

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<th>BRYANT ST Northbound</th>
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</tr>
<tr>
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<td></td>
<td></td>
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Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 07:45 AM

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<tr>
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<td>0 0 0 0 0</td>
<td>22 0 22</td>
<td>0 0 0 0 27</td>
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<tr>
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<td>27 1 28</td>
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| PHF        | 0.000 | 0.550 | 0.000 | 0.550 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.448 | 0.250 | 0.450 | 0.000 | 0.000 | 0.000 | 0.000 | 0.465 |

---

Traffic Data Service
San Jose, CA
(408) 622-4787
tdsbay@cs.com
Peak Hour Data

North

Peak Hour Begins at 07:45 AM

Bikes

Traffic Data Service
San Jose, CA
(408) 622-4787
tdsbay@cs.com
Groups Printed- Vehicles

<table>
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Traffic Data Service
San Jose, CA
(408) 622-4787
tdsbay@cs.com

File Name: 1PM FINAL
Site Code: 00000001
Start Date: 9/27/2016
Page No: 1
Traffic Data Service
San Jose, CA
(408) 622-4787
tdsbay@cs.com

Peak Hour Data

North

Peak Hour Begins at 05:00 PM
Vehicles

File Name: 1PM FINAL
Site Code: 00000001
Start Date: 9/27/2016
Page No: 2
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Traffic Data Service
San Jose, CA
(408) 622-4787
tdsbay@cs.com

File Name: 1PM FINAL
Site Code: 00000001
Start Date: 9/27/2016
Page No: 1

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PHF 0.000 .625 .250 .633 0.000 .250 0.000 .250 .000 .583 .000 .583 .000 .500 .000 .500 .714
Traffic Data Service
San Jose, CA
(408) 622-4787
tdsbay@cs.com

Peak Hour Data

Peak Hour Begins at 05:00 PM

Bicycles
### Groups Printed - Vehicles

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<th>PARK BLVD Northbound</th>
<th>SHERMAN AVE Eastbound</th>
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### Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

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### PHF Calculation

- **PHF** = \(\frac{\text{Grand Total}}{\text{Total Volume}}\)

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<tr>
<td>(408) 622-4787</td>
<td></td>
</tr>
<tr>
<td><a href="mailto:tdsbay@cs.com">tdsbay@cs.com</a></td>
<td></td>
</tr>
<tr>
<td></td>
<td>In</td>
</tr>
<tr>
<td>--------</td>
<td>-----</td>
</tr>
<tr>
<td>North</td>
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</tr>
<tr>
<td>SHERMAN AVE</td>
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<td>PARK BLVD</td>
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**Peak Hour Begins at 08:00 AM**

**Numbers of Vehicles**
### Groups Printed - Bikes

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<th>PARK BLVD Northbound</th>
<th>SHHERMAN AVE Eastbound</th>
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</tr>
<tr>
<td>07:30 AM</td>
<td>Right 0</td>
<td>Thru 0</td>
<td>Left 0</td>
<td>Peds 0</td>
</tr>
<tr>
<td>07:45 AM</td>
<td>Right 0</td>
<td>Thru 0</td>
<td>Left 0</td>
<td>Peds 0</td>
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</table>

Total: 0 26 0 26 | 1 1 0 0 | 2 | 0 87 2 0 | 89 | 0 0 1 0 | 118

### Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

| Start Time | Right 0 | Thru 0 | Left 0 | Peds 0 | App. Total 26 | Right 0 | Thru 0 | Left 0 | Peds 0 | App. Total 1 | Right 0 | Thru 0 | Left 0 | Peds 0 | App. Total 52 | Right 0 | Thru 0 | Left 0 | Peds 0 | App. Total 74 |
|------------|----------------------|------------------------|----------------------|------------------------|
| 08:00 AM   | Right 0 | Thru 0 | Left 0 | Peds 0 | App. Total 10 | Right 0 | Thru 0 | Left 0 | Peds 0 | App. Total 0 | Right 0 | Thru 0 | Left 0 | Peds 0 | App. Total 52 | Right 0 | Thru 0 | Left 0 | Peds 0 | App. Total 74 |
| 08:15 AM   | Right 0 | Thru 0 | Left 0 | Peds 0 | App. Total 20 | Right 0 | Thru 0 | Left 0 | Peds 0 | App. Total 0 | Right 0 | Thru 0 | Left 0 | Peds 0 | App. Total 75 | Right 0 | Thru 0 | Left 0 | Peds 0 | App. Total 74 |
| 08:30 AM   | Right 0 | Thru 0 | Left 0 | Peds 0 | App. Total 12 | Right 0 | Thru 0 | Left 0 | Peds 0 | App. Total 0 | Right 0 | Thru 0 | Left 0 | Peds 0 | App. Total 61 | Right 0 | Thru 0 | Left 0 | Peds 0 | App. Total 74 |
| 08:45 AM   | Right 0 | Thru 0 | Left 0 | Peds 0 | App. Total 13 | Right 0 | Thru 0 | Left 0 | Peds 0 | App. Total 0 | Right 0 | Thru 0 | Left 0 | Peds 0 | App. Total 65 | Right 0 | Thru 0 | Left 0 | Peds 0 | App. Total 78 |

Total Volume: 1 54 0 55 | 0 0 0 0 | 0 | 0 253 1 0 | 254 | 0 0 0 0 | 0 309

### Peak Hour for Entire Intersection Begins at 08:00 AM

| Start Time | Right 0 | Thru 0 | Left 0 | Peds 0 | App. Total 26 | Right 0 | Thru 0 | Left 0 | Peds 0 | App. Total 1 | Right 0 | Thru 0 | Left 0 | Peds 0 | App. Total 52 | Right 0 | Thru 0 | Left 0 | Peds 0 | App. Total 74 |
|------------|----------------------|------------------------|----------------------|------------------------|
| 08:00 AM   | Right 0 | Thru 0 | Left 0 | Peds 0 | App. Total 10 | Right 0 | Thru 0 | Left 0 | Peds 0 | App. Total 0 | Right 0 | Thru 0 | Left 0 | Peds 0 | App. Total 52 | Right 0 | Thru 0 | Left 0 | Peds 0 | App. Total 74 |
| 08:15 AM   | Right 0 | Thru 0 | Left 0 | Peds 0 | App. Total 20 | Right 0 | Thru 0 | Left 0 | Peds 0 | App. Total 0 | Right 0 | Thru 0 | Left 0 | Peds 0 | App. Total 75 | Right 0 | Thru 0 | Left 0 | Peds 0 | App. Total 74 |
| 08:30 AM   | Right 0 | Thru 0 | Left 0 | Peds 0 | App. Total 12 | Right 0 | Thru 0 | Left 0 | Peds 0 | App. Total 0 | Right 0 | Thru 0 | Left 0 | Peds 0 | App. Total 61 | Right 0 | Thru 0 | Left 0 | Peds 0 | App. Total 74 |
| 08:45 AM   | Right 0 | Thru 0 | Left 0 | Peds 0 | App. Total 13 | Right 0 | Thru 0 | Left 0 | Peds 0 | App. Total 0 | Right 0 | Thru 0 | Left 0 | Peds 0 | App. Total 65 | Right 0 | Thru 0 | Left 0 | Peds 0 | App. Total 78 |

Total Volume: 1 54 0 55 | 0 0 0 0 | 0 | 0 253 1 0 | 254 | 0 0 0 0 | 0 309

% App. Total: 1.8 98.2 0 | 0 0 0 0 | 0 | 0 99.6 0.4 | 0 | 0 0 0 0 | 0 813

PHF .250 .675 .000 .688 | .000 .000 .000 .000 | .000 .843 .250 .847 | .000 .000 .000 .000 | .813
Peak Hour Data

Peak Hour Begins at 08:00 AM
Bikes

Traffic Data Service
San Jose, CA
(408) 622-4787
tdsbay@cs.com
### Groups Printed - Vehicles

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<th>SHERMAN AVE Westbound</th>
<th>PARK BLVD Northbound</th>
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<td>50</td>
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| Grand Total | 10   | 463  | 7    | 9    | 489        |

| Approach %  | 2.3  | 96.2 | 1.5  | 16.7 | 33.3       |
| Total %     | 4.7  | 0.9  | 47.2 | 6.2  | 10.9       |

### Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Entire Intersection Begins at 05:00 PM

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| % App. Total | 2.3  | 96.2 | 1.5  | 16.7 | 33.3       |
| PHF          | .500 | .941 | .500 | .250 | .500       | .250  | .500 | .375 | .500 | .500       | .715  | .813 | .723 | .853       | .250 | .700 | .871 | .884       | 1564       |
### Groups Printed - Bikes

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| Apprch % | 1.1 | 98.9 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 98.9 | 2.1 | 0 | 98.9 | 0 | 0 | 0 | 0 | 0 |
| Total % | 0.7 | 64.4 | 0 | 0 | 65.2 | 0 | 0 | 0 | 0 | 34.1 | 0.7 | 0 | 34.8 | 0 | 0 | 0 | 0 | 0 |

### Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 05:00 PM

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| % App. Total | 1.7 | 98.3 | 0 | 0 | 0 | 0 | 0 | 0 | 98.4 | 1.6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 854 |

Traffic Data Service
San Jose, CA
(408) 622-4787
tdsbay@cs.com
### Groups Printed - Vehicles

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<th>Left</th>
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#### Total Volume

- **Grand Total:** 352 339 6 4 701
- **Appr %:** 50.2 48.4 0.9 0.6
- **Total %:** 20.2 19.5 0.3 0.2 40.3

#### PHF

- 0.888 0.863 0.375 0.951 0.750 0.500 0.438 0.817 0.832 0.845 0.750 0.417 0.774 0.796 0.923

---

**Traffic Data Service**  
San Jose, CA  
(408) 622-4787  
tdsbay@cs.com
Peak Hour Data

Peak Hour Begins at 08:00 AM
Vehicles

Traffic Data Service
San Jose, CA
(408) 622-4787
tdsbay@cs.com
## Traffic Data Service

**San Jose, CA**

**(408) 622-4787**

**tdsbay@cs.com**

---

File Name: 3AM FINAL  
Site Code: 00000003  
Start Date: 9/27/2016  
Page No: 1

### Groups Printed- Bikes

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### Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 08:00 AM

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**PHF** .000 .738 .000 .738 .000 .000 .250 .250 .500 .817 .250 .816 .000 .000 .000 .000 .837
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### Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 05:00 PM

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**Traffic Data Service**
San Jose, CA
(408) 622-4787
tdsbay@cs.com
Groups Printed- Vehicles

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| 08:15 AM | 0     | 6     | 7    | 4    | 17       | 5     | 2     | 2    | 11   | 8        | 94    | 8     | 4    | 114     | 0     | 0     | 0    | 8    | 8         |
| 08:30 AM | 1     | 14    | 7    | 3    | 25       | 4     | 1     | 4    | 2    | 11       | 12    | 100   | 9    | 3    | 124       | 2     | 0     | 2    | 5    | 9         |
| 08:45 AM | 0     | 13    | 8    | 3    | 24       | 7     | 0     | 2    | 2    | 11       | 13    | 89    | 8    | 6    | 116       | 0     | 1     | 1    | 6    | 8         |
| Total   | 2     | 39    | 26   | 10   | 77       | 17    | 4     | 9    | 8    | 38       | 39    | 383   | 38   | 22   | 482       | 3     | 1     | 3    | 23   | 30        | 627   |

| Approch % | 4.8   | 41.3  | 34.9  | 19     | 45.6   | 14.9  | 34.9  | 21.1   | 7.8   | 75.8 | 12.3 | 4.1 |
| Total %   | 0.6   | 5.3   | 4.5   | 2.4    | 12.8   | 2.6   | 1.1   | 1.2    | 5.8   | 5.9   | 9.3   | 3.1 |

| PHF | .500 | .696 | .813 | .761 | .607 | .500 | .563 | .833 | .750 | .958 | .375 | .250 | .375 | .438 | .904 |

Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Entire Intersection Begins at 08:00 AM

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Traffic Data Service
San Jose, CA
(408) 622-4787
tds@cs.com
Peak Hour Data

North

Peak Hour Begins at 08:00 AM
Vehicles

Traffic Data Service
San Jose, CA
(408) 622-4787
tdsbay@cs.com
### Groups Printed - Bikes

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### Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 07:45 AM

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Traffic Data Service
San Jose, CA
(408) 622-4787
tdsbay@cs.com

File Name: 5AM FINAL
Site Code: 00000005
Start Date: 9/27/2016
Page No: 2

Peak Hour Data

Peak Hour Begins at 07:45 AM
Bikes
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Traffic Data Service
San Jose, CA
(408) 622-4787
tdsbay@cs.com

Peak Hour Data

Peak Hour Begins at 04:45 PM

North

SHERMAN AVE

Out 241 In 99 Total 340

Right 9 Thru 55 Left 35

BIRCH ST

Out 241 In 99 Total 340

Out 31 In 31 Total 62

Right 13 Thru 13 Left 29

Left 4 Thru 37 Right 10

Total Out 67 In 51 Total 118

Peak Hour Data Service
San Jose, CA
(408) 622-4787
tdsbay@cs.com

File Name: 5PM FINAL
Site Code: 00000005
Start Date: 9/27/2016
Page No: 2
Groups Printed- Bikes

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Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Entire Intersection Begins at 05:00 PM

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Traffic Data Service
San Jose, CA
(408) 622-4787
tdsbay@cs.com

File Name : 5PM FINAL
Site Code : 00000005
Start Date : 9/27/2016
Page No : 2

Peak Hour Data

Peak Hour Begins at 05:00 PM
Bikes

North

Right 0
Thru 0
Left 0

Out Total
0 0

In
0 0

Total
0 0

Right 0
Thru 0
Left 0

Out Total
0 0

In
0 0

Total
0 0

Right 0
Thru 0
Left 0

Out Total
0 0

In
0 0

Total
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Right 0
Thru 0
Left 0

Out Total
0 0

In
0 0

Total
0 0

Right 0
Thru 0
Left 0

Out Total
0 0

In
0 0

Total
0 0
## Traffic Data Service

**San Jose, CA**

**(408) 622-4787**

tdsbay@cs.com

---

**File Name:** 6AM FINAL

**Site Code:** 00000006

**Start Date:** 9/27/2016

**Page No:** 1

### Groups Printed- Vehicles

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**Grand Total**

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### Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

**Peak Hour for Entire Intersection Begins at 08:00 AM**

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**Traffic Data Service**

**San Jose, CA**

**(408) 622-4787**

tdsbay@cs.com
## Groups Printed- Bikes

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## Traffic Data Service

San Jose, CA
(408) 622-4787
tdsbay@cs.com

File Name: 6AM FINAL
Site Code: 00000006
Start Date: 9/27/2016
Page No: 1

### Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 08:00 AM:

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Traffic Data Service
San Jose, CA
(408) 622-4787
tdsbay@cs.com

File Name : 6AM FINAL
Site Code : 00000006
Start Date : 9/27/2016
Page No : 2

Peak Hour Data

Peak Hour Begins at 08:00 AM
Bikes

North
### Traffic Data Service
San Jose, CA
(408) 622-4787
tdsbay@cs.com

File Name: 6PM FINAL
Site Code: 00000006
Start Date: 9/27/2016
Page No: 1

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Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Entire Intersection Begins at 04:00 PM

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### Traffic Data Service

San Jose, CA  
(408) 622-4787  
tdsbay@cs.com

**Groups Printed- Bikes**

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- GRANT AVE Westbound: 0%
- BIRCH ST Northbound: 100%
- GRANT AVE Eastbound: 0%

**Total %**

- BIRCH ST Southbound: 20%
- GRANT AVE Westbound: 20%
- BIRCH ST Northbound: 0%
- GRANT AVE Eastbound: 20%

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**Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1**

Peak Hour for Entire Intersection Begins at 04:30 PM

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- 0%

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- .250
- .250
- .250
- .250
- .250
- .500
- .500
- .500
- .500
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- .500
Traffic Data Service
San Jose, CA
(408) 622-4787
tdsbay@cs.com

File Name : 6PM FINAL
Site Code : 00000006
Start Date : 9/27/2016
Page No : 2

Peak Hour Data

BIRCH ST

GRANT AVE

Peak Hour Begins at 04:30 PM
Bikes

Out 1
In 1
Total 2

Right 0
Thru 0
Left 1

Out 2
In 2
Total 4

Right 0
Thru 1
Left 0

Out 2
In 2
Total 4

Right 0
Thru 1
Left 0
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**Traffic Data Service**
San Jose, CA
(408) 622-4787
tdsbay@cs.com

File Name: 7AM FINAL
Site Code: 00000007
Start Date: 9/27/2016
Page No: 1

Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Entire Intersection Begins at 08:00 AM

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Traffic Data Service
San Jose, CA
(408) 622-4787
tdsbay@cs.com

Peak Hour Data

Peak Hour Begins at 08:00 AM
Vehicles

492
41
131
20

North

529
37

Right
Thru
Left
### Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 08:00 AM

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### Traffic Data Service

San Jose, CA
(408) 622-4787

**tdsbay@cs.com**
Peak Hour Data

Peak Hour Begins at 08:00 AM

Traffic Data Service
San Jose, CA
(408) 622-4787
tdsbay@cs.com

BIRCH ST
Out 0 1 1
In 1 0 2
Total 2

SHERIDAN AVE
Out 0 0 0
In 0 0 0
Total 0

BIRCH ST
Out 0 1 1
In 1 0 2
Total 2

SHERIDAN AVE
Out 0 0 0
In 0 0 0
Total 0

Birch St

Sheridan Ave

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Left
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In
Out
Total
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2
2

Right
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Thru
3
Left
1

In
Out
Total
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5

Left
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In
Out
Total
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Peak Hour Begins at 08:00 AM
Bikes
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| Total %     | 0.8 | 7.9 | 3.2 | 1.3 | 13.2 | 1.2 | 3.6 | 7.8 | 0.4 | 12.9 | 16.3 | 41.9 | 9.8 | 68.3 | 0.3 | 4.4 | 0.5 | 0.4 | 5.6 | 187 |

### Peak Hour Analysis

Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 05:00 PM

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**PHF**

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Peak Hour Data

Peak Hour Begins at 05:00 PM
Vehicles

Traffic Data Service
San Jose, CA
(408) 622-4787
tdsbay@cs.com
### Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 04:15 PM

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## Traffic Data Service

**San Jose, CA**  
*(408) 622-4787*  
tdsbay@cs.com

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**Start Date**: 9/27/2016  
**Page No**: 1

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**Traffic Data Service**

San Jose, CA  
*(408) 622-4787*  
tdsbay@cs.com

**File Name**: 8AM FINAL  
**Site Code**: 00000008  
**Start Date**: 9/27/2016  
**Page No**: 1
### Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

**Peak Hour for Entire Intersection Begins at 07:30 AM**

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**Traffic Data Service**

San Jose, CA
(408) 622-4787
tdsbay@cs.com

File Name: 8AM FINAL
Site Code: 00000008
Start Date: 9/27/2016
Page No: 1
## Groups Printed - Vehicles

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- **ASH ST**

### Westbound
- **CALIFORNIA AVE**

### Northbound
- **ASH ST**

### Eastbound

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- **Peds**
- **App. Total**

### Total %
- **Right**
- **Thru**
- **Left**
- **Peds**
- **App. Total**

### PHF

Traffic Data Service
San Jose, CA
(408) 622-4787
tdsbay@cs.com
Traffic Data Service
San Jose, CA
(408) 622-4787
tdsbay@cs.com

File Name : 8PM FINAL
Site Code : 00000008
Start Date : 9/27/2016
Page No : 2

Peak Hour Data

Peak Hour Begins at 04:15 PM
Vehicles

Traffic Data Service
San Jose, CA
(408) 622-4787
tdsbay@cs.com
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**Traffic Data Service**
San Jose, CA
(408) 622-4787
tdsbay@cs.com

File Name: 8PM FINAL
Site Code: 00000008
Start Date: 9/27/2016
Page No: 1
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### Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

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Traffic Data Service
San Jose, CA
(408) 622-4787
tdsbay@cs.com

File Name: 9AM FINAL
Site Code: 00000009
Start Date: 9/27/2016
Page No: 1

**Peak Hour for Entire Intersection Begins at 07:15 AM**
Traffic Data Service
San Jose, CA
(408) 622-4787
tdsbay@cs.com

File Name : 9AM FINAL
Site Code : 00000009
Start Date : 9/27/2016
Page No  : 2

Peak Hour Data

Peak Hour Begins at 07:15 AM
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Peak Hour Data

North

Peak Hour Begins at 07:30 AM
Bikes

Peak Hour Data

San Jose, CA
(408) 622-4787
tdsbay@cs.com
### Groups Printed- Vehicles

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| Total %    | 7.5 8.6 6.2 8.8 31 | 1.7 5 2.2 6.2 15.1 | 0.7 2.1 1.5 8.2 12.5 | 7.8 7.6 7.6 18.3 41.4 |

### Traffic Data Service

San Jose, CA
(408) 622-4787
tdsbay@cs.com

File Name : 9PM FINAL
Site Code : 00000009
Start Date : 9/27/2016
Page No : 1

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### Peak Hour Analysis

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05:15 PM  | 2 5 9 16 | 1 3 4 8 | 1 3 2 6 | 4 13 2 19 | 49
05:30 PM  | 4 9 6 19 | 1 10 1 12 | 2 0 4 6 | 5 11 0 16 | 53
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| Total Volume | 11 22 29 62 | 9 26 11 46 | 3 10 8 21 | 26 40 10 76 | 205
| % App. Total | 17.7 35.5 46.8 | 19.6 56.5 23.9 | 14.3 47.6 38.1 | 34.2 52.6 13.2 | 899

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### Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 04:30 PM

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PHF .000 .375 .000 .375 .000 .000 .000 .000 .000 .000 .000 .250 .250 .500
### Traffic Data Service

**San Jose, CA**

(408) 622-4787
tdsbay@cs.com

**File Name**: 10AM FINAL  
**Site Code**: 00000010  
**Start Date**: 9/29/2016  
**Page No**: 1

#### Groups Printed - Vehicles

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| PHF | .25  .50  .50  .583  .000  .719  .583  .697  .917  .300  .542  .536  .708  .565  .250  .667  .830 |

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**Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1**

**Peak Hour for Entire Intersection Begins at 07:45 AM**

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**% App. Total**

|            | PHF | .25  .50  .50  .583  .000  .719  .583  .697  .917  .300  .542  .536  .708  .565  .250  .667  .830 |

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**Total Volume**

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**PHF**

| .25  .50  .50  .583  .000  .719  .583  .697  .917  .300  .542  .536  .708  .565  .250  .667  .830 |
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### Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

#### Peak Hour for Entire Intersection Begins at 07:30 AM

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**Grand Total**

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### Peak Hour Data

#### Directions
- **ASHT ST**
  - Right: 4
  - Thru: 41
  - Left: ?

- **ASH ST**
  - Right: 5
  - Thru: 27
  - Left: 3

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### Peak Hour Begins at 05:00 PM

Vehicles

San Jose, CA

Traffic Data Service

(408) 622-4787
tdsbay@cs.com
### Groups Printed- Bikes

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**Traffic Data Service**
San Jose, CA
(408) 622-4787
tdsbay@cs.com
### Traffic Data Service

San Jose, CA  
**408-622-4787**

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- **ASH ST Northbound**
- **SHERIDAN AVE Eastbound**

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| Grand Total | 16    | 25   | 22   | 13   | 76         | 21    | 236  | 8    | 2    | 267        | 8     | 17   | 29   | 4    | 58         | 10    | 49   | 10   | 12   | 81         |

| Apprch %    | 21.1  | 32.9 | 28.9 | 17.1 | 7.8        | 7.9   | 88.4 | 3    | 0.7  | 13.8       | 13.8  | 29.3 | 50   | 6.9  | 12.3       | 12.3  | 60.5 | 12.3 | 14.8 | 14.8       |

| Total %     | 3.3   | 5.2  | 4.6  | 2.7  | 15.8       | 4.4   | 49   | 1.7  | 0.4  | 55.4       | 1.7   | 3.5  | 6    | 0.8  | 12         | 2.1   | 10.2 | 2.1  | 2.5  | 16.8       |

#### PHF

| PHF | .500 | .571 | .700 | .731 | .583 | .821 | .625 | .789 | .500 | .688 | .875 | .818 | .583 | .813 | .500 | .750 | .862 |

---

Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 07:45 AM

### Traffic Data Service

San Jose, CA  
**408-622-4787**

tdsbay@cs.com
Traffic Data Service
San Jose, CA
(408) 622-4787
tdsbay@cs.com

File Name: 11AM FINAL
Site Code: 00000011
Start Date: 9/27/2016
Page No: 2

Peak Hour Data

North

Peak Hour Begins at 07:45 AM
Vehicles

ASH ST

Right
8

Thru
161

Left
14

Out
31

In
38

Total
69

SHERIDAN AVE

Right
4

Thru
7

Left
26

Out
36

In
21

Total
64

SHERIDAN AVE

Right
4

Thru
11

Left
5

Out
38

In
31

Total
69

ASH ST

Left
211

Thru
111

Right
4

Out
28

In
36

Total
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Traffic Data Service  
San Jose, CA  
(408) 622-4787  
tdsbay@cs.com  

File Name: 11AM FINAL  
Site Code: 00000011  
Start Date: 9/27/2016  
Page No: 1

Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1  
Peak Hour for Entire Intersection Begins at 07:30 AM  

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Traffic Data Service
San Jose, CA
(408) 622-4787
tdsbay@cs.com

File Name: 11AM FINAL
Site Code: 00000011
Start Date: 9/27/2016
Page No: 2

Peak Hour Data

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Peak Hour Begins at 07:30 AM
Bikes

SHERIDAN AVE

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### Groups Printed- Vehicles

**ASH ST Southbound**
- Start Date: 9/27/2016

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### Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

**Peak Hour for Entire Intersection Begins at 04:45 PM**

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## Traffic Data Service

San Jose, CA  
(408) 622-4787  
tdsbay@cs.com

- **File Name**: 11PM FINAL  
- **Site Code**: 00000011  
- **Start Date**: 9/27/2016  
- **Page No**: 1

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### Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

**Peak Hour for Entire Intersection Begins at 04:15 PM**

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### Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

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**% App. Total**

| PHF | .656 | .922 | .817 | .906 | .734 | .500 | .538 | .821 | .650 | .827 | .708 | .834 | .700 | .450 | .688 | .778 | .896 |

**PHF** (Peak Hour Factor)
### Traffic Data Service

San Jose, CA  
(408) 622-4787  
tdsbay@cs.com

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#### Peak Hour Data

**North**

- **EL CAMINO REAL**
  - Right: 42
  - Thru: 1224
  - Left: 49
  - Total: 2971

- **CAMBRIDGE AVE**
  - Right: 94
  - Thru: 16
  - Left: 28
  - Total: 138

- **CAMBRIDGE AVE**
  - Right: 28
  - Thru: 1529
  - Left: 26
  - Total: 1572

- **EL CAMINO REAL**
  - Right: 171
  - Thru: 1529
  - Left: 26
  - Total: 2838

Peak Hour Begins at 08:00 AM

- **Vehicles**

Traffic Data Service  
San Jose, CA  
(408) 622-4787  
tdsbay@cs.com
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Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Entire Intersection Begins at 07:00 AM

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PHF .000 .500 .000 .500 .000 .000 .000 .000 .250 .000 .250 .000 .250 .000 .250 .375

Traffic Data Service
San Jose, CA
(408) 622-4787
tdsbay@cs.com
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Peak Hour Begins at 05:00 PM

Vehicles 2825
### Traffic Data Service
**San Jose, CA**
(408) 622-4787
tdsbay@cs.com

File Name: 12PM FINAL
Site Code: 00000012
Start Date: 9/27/2016
Page No: 1

#### Groups Printed - Bikes

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Traffic Data Service
San Jose, CA
(408) 622-4787
tdsbay@cs.com

File Name: 12PM FINAL
Site Code: 00000012
Start Date: 9/27/2016
Page No: 2

Peak Hour Data

Peak Hour Begins at 04:45 PM

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**Grand Total**

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**PHF**


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**Traffic Data Service**  
San Jose, CA  
(408) 622-4787  
tdsbay@cs.com
### Groups Printed: Bikes

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Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 07:30 AM

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Traffic Data Service
San Jose, CA
(408) 622-4787
tdsbay@e3.com

File Name: 13AM FINAL
Site Code: 00000013
Start Date: 9/27/2016
Page No: 1
Peak Hour Data

North

Peak Hour Begins at 07:30 AM

Traffic Data Service
San Jose, CA
(408) 622-4787
tdsbay@cs.com
# Traffic Data Service

San Jose, CA  
(408) 622-4787  
tdssbay@cs.com

File Name: 13PM FINAL  
Site Code: 00000013  
Start Date: 9/27/2016  
Page No: 1

## Groups Printed-Vehicles

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## Peak Hour Analysis

- **Start Time:** 04:00 PM to 05:45 PM - Peak 1 of 1
- **Peak Hour for Entire Intersection Begins at 05:00 PM**

### Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

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Peak Hour Data

North

Peak Hour Begins at 05:00 PM
Vehicles

Left Thru Right

691 1241 85

1927 1395 3322

Out  In Total

Traffic Data Service
San Jose, CA
(408) 622-4787
tdsbay@cs.com
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### Peak Hour Analysis

Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 05:00 PM

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*Traffic Data Service*

San Jose, CA
(408) 622-4787
tdsbay@cs.com

File Name: 13PM FINAL
Site Code: 00000013
Start Date: 9/27/2016
Page No: 1
Traffic Data Service
San Jose, CA
(408) 622-4787
tdsbay@cs.com

File Name: 13PM FINAL
Site Code: 00000013
Start Date: 9/27/2016
Page No: 2

Peak Hour Data
Peak Hour Begins at 05:00 PM

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Total 1

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In 37
Total 37

North

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| Peak Hour for Entire Intersection Begins at 05:00 PM
| 05:00 PM   | 64    | 289  | 119  | 2    | 472       | 40    | 154  | 68   | 6    | 262       | 72    | 191  | 55   | 5    | 318       | 72        |
| 05:15 PM   | 55    | 309  | 132  | 49   | 496       | 50    | 194  | 76   | 32   | 320       | 58    | 167  | 70   | 295  | 2517      | 64        |
| 05:30 PM   | 63    | 322  | 113  | 2    | 498       | 40    | 188  | 77   | 305  | 305       | 56    | 207  | 68   | 331  | 1747      | 73        |
| 05:45 PM   | 78    | 292  | 98   | 2    | 469       | 44    | 212  | 82   | 338  | 338       | 38    | 223  | 54   | 315  | 224      | 56        |
| Total      | 260   | 1212 | 462  | 1934 | 1934      | 174   | 748  | 303  | 1225 | 1225      | 224   | 788  | 247  | 1259 | 224      | 265       |
| % App. Total| 13.4  | 62.7 | 23.9 |      |            | 14.2  | 61.1 | 24.7 |      |            | 17.8  | 62.6 | 19.6 |      |            | 15.6      |
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Peak Hour for Entire Intersection Begins at 04:30 PM

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<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| Total      | 0     | 1    | 0    | 1          | 1     | 1    | 0    | 2          | 0     | 8    | 1    | 9          | 0     | 16   | 1    | 17         | 22

% App. Total:
Total Volume: 10
% App. Total: 9.1

PHF: .000 .250 .000 .250 .000 .250 .000 .250 .000 .250 .000 .625 .250 .688 .813
APPENDIX B: TRIP GENERATION SURVEYS
May 11, 2010

City of Sandy
Attention: Tracy Brown
39250 Pioneer Boulevard
Sandy, Oregon 97055

Re: Sandy Police Facility
Traffic Analysis Letter
Project Number 2090113.00

Dear Mr. Brown:

Group Mackenzie has prepared this traffic analysis letter addressing Development Code Section 17.100 (Land Division) requirements relating to the proposed Sandy Police Facility along US 26 in Sandy, Oregon.

PROPOSED DEVELOPMENT

The proposed Sandy Police facility consists of a new 9,450 square foot building located on the now defunct Ford Dealership site bordering the north side of US 26 and the south side of Pleasant Street, just east of SE Ten Eyck Road. The site consists of three existing tax lots totaling approximately 0.55 acres. A site plan is provided in Appendix A of this letter. As shown on the site plan figure, the proposed development will have two full-access driveways to Pleasant Street. The western driveway will provide access to six parking spaces designated for public use, and the eastern driveway will provide access to 17 parking spaces designated for police vehicles within a secured parking lot. No direct access is proposed to US 26; therefore, the existing US 26 access will be removed.

TRIP GENERATION

Typically, the Institute of Transportation Engineers (ITE) Trip Generation manual is used as a resource to estimate site trip generation for land uses. However, in this case, the ITE manual contains no suitable land use category matching the unique police station trip-generating characteristics. Instead, development trip generation was based on trip generation studies prepared for comparable police station sites in the Portland metropolitan area.

Table 1 presents estimated Sandy Police station trip generation for the average weekday, weekday AM peak hour, and weekday PM peak hour. The section following this table explains assumptions and resources used to support these estimates.

<table>
<thead>
<tr>
<th>Proposed Land Use</th>
<th>Size</th>
<th>ADT</th>
<th>AM Peak Hour</th>
<th>PM Peak Hour</th>
</tr>
</thead>
<tbody>
<tr>
<td>Police Station</td>
<td>9,450 SF</td>
<td>281</td>
<td>14</td>
<td>18</td>
</tr>
</tbody>
</table>
City of Sandy
Sandy Police Station
Project Number 2090113.00
May 11, 2010
Page 2

Trip Generation Assumptions
The weekday PM peak hour site trip generation is based on a Portland State University (PSU) study of four existing police stations in the Portland metropolitan area. The PSU study is attached to this letter as Appendix B for reference. This study is considered a suitable resource given the sample size of four sites, the compatible range of building sizes (1,200 SF to 13,375 SF), and the fact that the surveyed stations are stand-alone facilities. The trip generation equation documented in this study was used to estimate trip generation for the proposed Sandy Police facility.

The average weekday and AM peak hour trip generation estimates are based on survey results conducted at the Central Police Precinct of Vancouver, Washington, which are attached for reference in Appendix C. As identified in the survey, the ratio of vehicle trips occurring during the average weekday relative to the PM peak hour is 15.6 (312 trips/20 trips), and the ratio between the trips occurring between the AM and PM peak hours is 0.775 (15.5 trips/20 trips). These ratios were applied to the PM peak hour vehicle trips summarized in Table 1 for the Sandy Police facility to estimate trips for the average weekday and the weekday AM peak hour.

TRIP DISTRIBUTION
Given the site location on the eastern city fringe, most site trips will have an origin or destination to US 26 west on the one-way couplet system through downtown. A nominal amount of site traffic is expected to utilize SE Ten Eyck Road to the north, Wolf Drive to the south, and US 26 to the east.

VEHICLE ACCESS
As shown in the attached site plan figure, two driveways will access Pleasant Street, with public traffic using the western driveway and police traffic using the eastern driveway. No direct access is proposed to US 26.

DRIVEWAY WIDTHS
Per the site plan figure, the Pleasant Street driveways will be 25 feet in width and designed according to City of Sandy Standard Detail 208A.

DRIVEWAY SPACING
The Pleasant Street driveways will be 145 feet apart (measured centerline-to-centerline). The west site access driveway will be approximately 60 feet from another property driveway to the west, with the east site access driveway approximately 110 feet from another property driveway to the east. There are no driveways on the north side of Pleasant Street across from the site frontage, except for a driveway to a developed property approximately 70 feet east of the eastern site access driveway, and in line with the eastern site property line.
City of Sandy
Sandy Police Station
Project Number 2090113.00
May 11, 2010
Page 3

The City's Transportation System Plan (TSP) classifies Pleasant Street as a Local street with no access spacing standards. Given no standards apply, the number and location of proposed site access driveways are adequate and in compliance with City standards.

DRIVEWAY SIGHT DISTANCE

Based on a review of the City's existing street map, aerial photos, and a windshield survey, there are no horizontal or vertical curves that limit driveway sight distance along Pleasant Street. Drivers exiting both site access driveways will be able to see along the entire length of Pleasant Street, from where it begins at SE Ten Eyck Road (approximately 190 feet west of the western site access driveway) to where it terminates as a dead-end (approximately 270 feet east of the eastern site access driveway). Because drivers can see along the entire length of road, adequate sight distance exists.

DRIVER SAFETY

Based on limited site trip generation, the separation of public trips and police trips via two separate site access driveways, and the review for conformance with the City's driveway width, spacing, and sight distance standards, the proposed development is not anticipated to adversely impact the safety or operating conditions of the surrounding street network.

COMPLIANCE WITH TRANSPORTATION SYSTEM PLAN

The proposed site development is in compliance with the applicable standards specified in the City's Transportation System Plan and Development Code. The proposed Pleasant Street driveways and the proposed Pleasant Street and US 26 frontage improvements are consistent with the respective roadway functional classifications, applicable street design sections, access management policies, and sight distance standards.

If you have any questions or need further information, please contact me at 503-224-9560.

Sincerely,

[Signature]

Brian J. Dunn, P.E.
Traffic Engineer

Enclosures: Appendix A – Site Plan (Figure C2.1)
Appendix B – PSU Police Station Trip Generation Study
Appendix C – Trip Surveys for Vancouver Central Police Precinct
January 31, 2005

City of Vancouver
Attention: Ahmad Qayoumi
PO Box 1995
210 East 13th Street
Vancouver, WA 98668

Re: Vancouver East Precinct
Updated Trip Generation
Project Number: 2040384

Dear Mr. Qayoumi:

As was previously agreed, surveys were conducted at the existing Central Police Precinct and construction services office to best determine the future trip generation at the proposed location at Mill Plain and SE 155th Avenue. The Central Police Precinct was surveyed instead of the East Precinct because it is similar in building size and employees, and is able to be surveyed more accurately. The purpose of this letter is to provide you with the surveyed findings, proposed trip generation and proposed study area.

SURVEYS

Road tubes were placed at the Central Police Precinct driveway on Stapleton to collect three full days of data. Manual counts were also conducted at the driveway on one day of the week during the AM and PM peak hours of the roadways to corroborate the tube data. The Central Precinct is 7,800 SF and has 8 employees working 8:00 a.m. to 5:00 p.m. The East Precinct is also 7,600 SF and has 7 employees working 8:00 a.m. to 5:00 p.m. Both precincts have similar officer shift schedules.

The driveway does not have a clearly defined throat area, making it difficult to obtain accurate data. The first week of data was collected with an inappropriate layout, and thus was not usable. The second week of data was collected with the correct tube layout, but due to the parking lot layout there appeared to be many cars crossing the tubes at an angle. The manual count during this week was approximately 49% of the tube count. This percentage was applied to the daily volumes of the tube count to get an adjusted daily trip volume. Peak hour trips as presented below were an average of the two manual counts. The table below presents the average trips and trip rates from this site.

<table>
<thead>
<tr>
<th>Surveyed Central Police Precinct</th>
<th>Daily</th>
<th>AM Peak</th>
<th>PM Peak</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Trips</td>
<td>312</td>
<td>15.5</td>
<td>20</td>
</tr>
<tr>
<td>Percentage Enter/Exit</td>
<td>50% / 50%</td>
<td>53% / 47%</td>
<td>47% / 53%</td>
</tr>
</tbody>
</table>
A manual trip survey was also conducted at the existing Construction Services office over a three-day period. A log at the front desk tracked all visitors, delivery and administrative staff, while the Construction Services employees kept individual logs of their departure and arrival times. The site currently has 24 employees. The table below presents the average trips and trip rates from the existing Construction Services site.

<table>
<thead>
<tr>
<th>Surveyed Construction Services</th>
<th>Daily</th>
<th>AM Peak</th>
<th>PM Peak</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Trips</td>
<td>116</td>
<td>15</td>
<td>17</td>
</tr>
<tr>
<td>Percentage Enter/Exit</td>
<td>50% / 50%</td>
<td>93% / 17%</td>
<td>24% / 76%</td>
</tr>
</tbody>
</table>

**PROPOSED SITE**

The proposed East Precinct site will be 26,736 SF. Initially, Construction Services will occupy 9,200 SF of the new building and the existing East Police Precinct will occupy the remainder of the building. The increase in building space for the East Precinct is due to several new areas including an exercise room and training room, and some expanded areas including holding cells and evidence collection. These increased areas are designed for use by the current staff and will not generate new trips. In the future, the police precinct may expand into the Construction Services space; however, the few additional police employees that would be expected are not anticipated to generate more trips than Construction Services. Therefore, the trip generation for analysis is proposed to include the two surveyed sites.

<table>
<thead>
<tr>
<th>Proposed Trip Generation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scenario</td>
</tr>
<tr>
<td>-----------</td>
</tr>
<tr>
<td>Combined Use</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

**PROPOSED STUDY AREA**

Intersection level of services analysis will be provided at the following intersections impacted by 10 or more AM trips:

- SE Mill Plain and SE 164th Avenue
- SE Mill Plain and SE 155th Avenue
- SE Mill Plain and Hearthwood Boulevard
- SE Mill Plain and SE 148th Avenue
- SE Mill Plain and SE 138th Avenue
- SE Mill Plain and SE 131st Avenue/Park Plaza Dr
- SE Mill Plain and SE 126th Avenue
- SE Mill Plain and SE 123rd Avenue
- SE Mill Plain and SE 120th Avenue
City of Vancouver  
Vancouver East Precinct  
Project Number 2040384  
January 31, 2005  
Page 3

- SE Mill Plain and SE 117th Avenue  
- SE Mill Plain and Chkalov/NE 112th Ave

Please confirm you acceptance of these assumptions for use in the traffic analysis for the  
Vancouver Police East Precinct project. If you have any questions, or need further  
information, please contact me at 503-224-9560.

Sincerely,  

Elizabeth Bush

Brent Ahrend, P.E.  
Traffic Engineer

BTA/mpd

Enclosures: Trip Distribution and Assignment Figure

c: Jeff Humphreys, Brent Sanborn – Group Maconzie
LEGEND

29% = TRIP DISTRIBUTION PERCENTAGE
4 = AM PEAK HOUR SITE TRIPS

AM PEAK HOUR TRIPS = 31
Trip Generation Survey from 2007 Palo Alto Public Safety Building DEIR
Department and emergency dispatch operations from the City’s downtown City Center complex to the project site would not be expected to impede the development or function of planned pedestrian or bicycle facilities.

(2) The project site vicinity is reasonably well served by transit: a multi-modal transit station is located on Park Boulevard at California Avenue and is served by Caltrain and all regional bus routes including Santa Clara County (VTA) lines, Sam Trans, Dumbarton Bridge services, and Stanford Marguerite. Relocation of the City’s Police Department and emergency dispatch operations from the City’s downtown City Center complex to the project site would reduce the level of transit accessibility for the project employees, but would not impede the operation of local transit system facilities as a result of congestion.

11.3.2 Proposed Project

(a) Option A. Under project Option A, the proposed new approximately 50,000-square-foot PSB facility would replace an existing, occupied 3,000-square-foot office building now on the project site. The Option A design includes a total of 161 on-site parking spaces, including 52 in the secured City vehicle underground parking area ("patrol parking"), 99 in the staff parking area, and 10 spaces at grade along the Sheridan Avenue frontage (90-degree spaces). On-street parallel parking would remain available along the project’s Page Mill Road frontage.

(b) Option B. Under the project Option B design, the existing occupied 3,000-square-foot office building on the smaller 0.30-acre triangular-shaped parcel would remain. Only the larger 1.21-acre L-shaped parcel would be utilized to accommodate the new PSB facility. The Option B design includes on-site (offstreet) parking provisions for 161 vehicles, including 151 above-grade parking level spaces for secure patrol vehicle parking (52 spaces) and staff, volunteer and visitor parking (99 spaces), plus 12 90-degree spaces along the Sheridan Avenue frontage for visitor use.

11.3.3 Project Roadway System Impacts

(a) Project Trip Generation. Currently, the Police Department operations are located primarily within the City Center complex at 275 Forest Avenue, with patrol cars entering and existing the complex on a regular basis. The new PSB project would involve relocating City Police Department and emergency dispatch operations to the new Park Boulevard location, with patrol cars entering and exiting the relocated facility at a similar rate. In addition, as administrative center for the Police Department, the general public would be visiting the building for administrative and community business.

With the exception of administrative staff, many of the project employee trips would take place outside of the normal peak commute hour, because the work shifts for police and emergency dispatch workers do not correspond to the typical 9 AM to 5 PM business period. In addition, not all department members would be working at one time; a maximum of two-thirds of the police force is estimated to be working at one time. Therefore, the net increase in peak hour employee trips generated by the new PSB employees would be substantially less than for a more typical administrative use of a building of the proposed PSB size.

Peak Commute Period Trip Generation. Project trip generation projections were developed using detailed data supplied by the Palo Alto Police Department reflecting current and anticipated arrival/departure times for all employees, visitors, volunteers and deliveries for...
each hour of the day. City vehicle (i.e. patrol car, etc.) arrival/departure patterns were also provided on an hourly basis. Data was supplied for existing police services operations as well as for the increment of additional traffic that would be expected with the maximum planned expansion of police department employees. These detailed projections are tabulated in Appendix 16.3 of this EIR (Supplemental Traffic Information). Table 11.8 presents a summary of in and outbound traffic (after expansion) for the peak traffic hours during the morning and evening commute periods (7:00-8:00 AM, 8:00-9:00 AM, 4:00-5:00 PM, 5:00-6:00 PM). It should be noted that the police patrol shift schedule option producing the highest number of inbound and outbound vehicles during the commute peak traffic periods was used for evaluation purposes.

As shown in Table 11.8, the maximum peak project traffic generation during the weekday morning commute period would be expected to occur from 7:00-8:00 AM, with 39 (35+4) inbound and 28 (25+3) outbound vehicles. During the weekday evening commute period, the project’s peak traffic generation would be expected to occur from 5:00-6:00 PM, with 28 (24+4) inbound and 33 outbound vehicles. In order to provide a conservative worst case analysis and with the approval of City staff, all project trip generation projections have been increased by a 20 percent factor to make sure that any changes in work shifts that may be required in the future and associated additional trip generation during the peak commute periods are accounted for in this EIR analysis. With a 20 percent safety factor added, the proposed project would generate 47 inbound and 34 outbound trips during the AM commute peak hour, with 34 inbound and 40 outbound trips during the PM commute peak traffic hour.

Community Room. The proposed project will contain a community room, which will be available to the citizens of Palo Alto for meetings and events as well as to the police and other City departments for meetings and training presentations. For EIR purposes, and based on the proposed room size (approximately 2,125 square feet), it is assumed that the maximum community room event attendee trip generation total would be limited to 50 vehicles, and would occur only during evenings when sufficient on-site parking would be available. For “worst case” EIR purposes, the evaluation also assumes arrival of the 50 vehicles for an evening meeting during the peak PM commute hour.

Net Change. For project Option A, the 3,000-square-foot office building now in use on the project site would be removed. As shown in Table 11.9, the exiting office building is projected to be generating 4 inbound and 1 outbound vehicles during the AM commute peak hour, with 1 inbound and 4 outbound vehicles during the PM commute peak hour.\footnote{Office trip rates were obtained from the traffic engineering profession’s standard source of trip rate data, 7th Generation-7th Edition, by the Institute of Transportation Engineers, 2003.} Removal of these trips would represent less than a 10 percent reduction in the total AM and PM inbound and outbound peak hour trips generated by the PSB, and therefore would have a minimal effect on overall project traffic impacts.

It should also be noted, for both Options A and B, that some police-related traffic is already occurring on the local surface street system evaluated in this study (patrol cars, some employee home to work/home to trips, etc.). In order to provide an additional level of conservative analysis, no adjustments were made in the new PSB building trip generation or distribution projections to reflect reassignment of these existing trips. Instead, there is an intentional double counting of some police-related vehicular trips from the PSB project in the EIR “with project” intersection traffic volume and LOS computations.
### Table 11.8

**PSB TRIP GENERATION SUMMARY**

<table>
<thead>
<tr>
<th>Description</th>
<th>AM Peak Hour Trips</th>
<th>PM Peak Hour Trips</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>In</td>
<td>Out</td>
</tr>
<tr>
<td>Personal Vehicles:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Patrol</td>
<td>2</td>
<td>6</td>
</tr>
<tr>
<td>Traffic &amp; Parking</td>
<td>9 (+3)</td>
<td>1</td>
</tr>
<tr>
<td>ISD &amp; Crime Prevention</td>
<td>11</td>
<td>6</td>
</tr>
<tr>
<td>TSO &amp; Records</td>
<td>5</td>
<td>3</td>
</tr>
<tr>
<td>Communications &amp; EDC</td>
<td>1 (+1)</td>
<td>1</td>
</tr>
<tr>
<td>Admin &amp; P&amp;T</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Public Visits</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Volunteers</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Deliveries</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td><strong>Subtotal Personal Vehicles</strong></td>
<td><strong>30 (+4)</strong></td>
<td><strong>7</strong></td>
</tr>
<tr>
<td>City Vehicles:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Patrol</td>
<td>4</td>
<td>13</td>
</tr>
<tr>
<td>Traffic &amp; Parking</td>
<td>1</td>
<td>5 (+3)</td>
</tr>
<tr>
<td>ISD &amp; Crime Prevention</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Subtotal City Vehicles</strong></td>
<td><strong>5</strong></td>
<td><strong>18 (+3)</strong></td>
</tr>
<tr>
<td>PSB Total</td>
<td>35 (+4)</td>
<td>25 (+3)</td>
</tr>
<tr>
<td>PSB Total + Growth + 20%</td>
<td>47</td>
<td>34</td>
</tr>
<tr>
<td>Safety Factor</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Community Room</td>
<td>0</td>
<td></td>
</tr>
</tbody>
</table>

**SOURCE:** Palo Alto Police Department and Crane Transportation Group, April 2007

(XX) = Growth increment

### Table 11.9

**EXISTING TRIP GENERATION: OFFICE BUILDING NOW ON PSB PROJECT SITE**

<table>
<thead>
<tr>
<th>Use</th>
<th>Size</th>
<th>AM Peak Hour Trips</th>
<th>PM Peak Hour Trips</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Inbound</td>
<td>Outbound</td>
</tr>
<tr>
<td></td>
<td>Rate</td>
<td>Vol</td>
<td>Rate</td>
</tr>
<tr>
<td>Office</td>
<td>3,000 sq. ft.</td>
<td>11.01</td>
<td>34</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1.98</td>
<td>1</td>
</tr>
</tbody>
</table>


Compiled by: Crane Transportation Group
APPENDIX C: INTERSECTION TECHNICAL CALCULATIONS
Intersection #1: Park Blvd & Sherman Ave

Street Name:            Park Blvd                        Sherman Ave
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R

Volume Module:
Base Vol:      34  134     3     4  151     4     7    0    34     6    1     8
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00  1.00
Initial Bse:   34  134     3     4  151     4     7    0    34     6    1     8
Added Vol:      0    0     0     0    0     0     0    0     0     0    0     0
PasserByVol:    0    0     0     0    0     0     0    0     0     0    0     0
Initial Fut:   34  134     3     4  151     4     7    0    34     6    1     8
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00  1.00
PHF Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00  1.00
PHF Volume:    34  134     3     4  151     4     7    0    34     6    1     8
Reduct Vol:      0    0     0     0    0     0     0    0     0     0    0     0
FinalVolume:   34  134     3     4  151     4     7    0    34     6    1     8

Critical Gap Module:
Critical Gp:  4.1 xxxx xxxxx   4.1 xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
FollowUpTim:  2.2 xxxx xxxxx   2.2 xxxx xxxxx  3.5  4.0   3.3   3.5  4.0   3.3

Capacity Module:
Cnflict Vol:  155 xxxx xxxx   137 xxxx xxxx   369  366   153   382  367   136
Potent Cap.: 1438 xxxx xxxx   1459 xxxx xxxx   591  566   580  565  569  919
Move Cap.:  1438 xxxx xxxx   1459 xxxx xxxx   573  551   547  550  919
Volume/Cap:  0.02 xxxx xxxx   0.01 xxxx xxxx  0.01 0.00  0.04 0.01 0.00 0.01

Level Of Service Module:
2Way95thQ:    0.1 xxxx xxxx   0.0 xxxx xxxx   xxx xxxxx xxxxx xxxx xxxx xxxx
Control Del:    7.6 xxxx xxxx   7.5 xxxx xxxx   xxx xxxxx xxxxx xxxx xxxx xxxx
LOS by Move:  A *     * A *     *     *     *     *     *     *     *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxxx xxxx xxxx   xxxx xxxx xxxx   819 xxxx xxxx   698 xxxx
SharedQueue:xxxxx xxxx xxxx   xxxx xxxx xxxx   0.2 xxxx xxxx   0.1 xxxx
Shrd ConDel:xxxxxx xxxx xxxx   xxxx xxxx xxxx   9.6 xxxx xxxx   10.3 xxxx
Shared LOS:     *     *     *     *     *     *     *     A     *     B     *
ApproachDel:    xxxxx           xxxxx              9.6             10.3
ApproachLOS:         *                *                A                B
Note: Queue reported is the number of cars per lane.

Peak Hour Delay Signal Warrant Report

Future Volume Alternative: Peak Hour Warrant NOT Met
**SIGNAL WARRANT DISCLAIMER**

This peak hour signal warrant analysis should be considered solely as an "indicator" of the likelihood of an unsignalized intersection warranting a traffic signal in the future. Intersections that exceed this warrant are probably more likely to meet one or more of the other volume based signal warrant (such as the 4-hour or 8-hour warrants).

The peak hour warrant analysis in this report is not intended to replace a rigorous and complete traffic signal warrant analysis by the responsible jurisdiction. Consideration of the other signal warrants, which is beyond the scope of this software, may yield different results.

---

### Intersection #1 Park Blvd & Sherman Ave

#### Future Volume Alternative: Peak Hour Warrant NOT Met

<table>
<thead>
<tr>
<th>Approach:</th>
<th>North Bound</th>
<th>South Bound</th>
<th>East Bound</th>
<th>West Bound</th>
</tr>
</thead>
<tbody>
<tr>
<td>Movement:</td>
<td>L - T - R</td>
<td>L - T - R</td>
<td>L - T - R</td>
<td>L - T - R</td>
</tr>
<tr>
<td>Control:</td>
<td>Uncontrolled</td>
<td>Stop Sign</td>
<td>Stop Sign</td>
<td>Stop Sign</td>
</tr>
<tr>
<td>Lanes:</td>
<td>0 0 1! 0 0 0 0 0 1! 0 0 0 0 1! 0 0 0 0 1! 0 0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Initial Vol:</td>
<td>34 134 3 4 151 4 7 0 34 6 1 8</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Approach Del:</td>
<td>xxxxxxx</td>
<td>9.6</td>
<td>10.3</td>
<td></td>
</tr>
</tbody>
</table>

**SIGNAL WARRANT DISCLAIMER**

This peak hour signal warrant analysis should be considered solely as an "indicator" of the likelihood of an unsignalized intersection warranting a traffic signal in the future. Intersections that exceed this warrant are probably more likely to meet one or more of the other volume based signal warrant (such as the 4-hour or 8-hour warrants).

The peak hour warrant analysis in this report is not intended to replace a rigorous and complete traffic signal warrant analysis by the responsible jurisdiction. Consideration of the other signal warrants, which is beyond the scope of this software, may yield different results.
### Intersection #1: Park Blvd & Sherman Ave

**Traffic Volume**

<table>
<thead>
<tr>
<th>Final Vol</th>
<th>Signal=Uncontrol/Rights=Include</th>
<th>Lane 1</th>
<th>Lane 2</th>
<th>Lane 3</th>
<th>Lane 4</th>
<th>Lane 5</th>
<th>Lane 6</th>
<th>Lane 7</th>
<th>Lane 8</th>
<th>Lane 9</th>
<th>Lane 10</th>
</tr>
</thead>
<tbody>
<tr>
<td>15</td>
<td></td>
<td>0</td>
<td>0</td>
<td>151</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td></td>
<td>0</td>
<td>0</td>
<td>11</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>6</td>
<td>0</td>
</tr>
<tr>
<td>51</td>
<td></td>
<td>0</td>
<td>0</td>
<td>11</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>6</td>
<td>0</td>
</tr>
</tbody>
</table>

**Critical Volume**

- Critical V/C: 0.057
- Avg Critical Del (sec/veh): 2.7
- Avg Delay (sec/veh): 2.7
- LOS: B

**Traffic Volume Module**

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
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<th></th>
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<th></th>
<th></th>
</tr>
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<tbody>
<tr>
<td>North</td>
<td>34 134</td>
<td>1.00 1.00</td>
<td>34 134</td>
<td>12</td>
<td>0</td>
<td>46 134</td>
<td>1.00 1.00</td>
<td>1.00 1.00</td>
<td>166</td>
<td>6 1 8</td>
<td>46 134</td>
</tr>
<tr>
<td>South</td>
<td>134 3</td>
<td>1.00 1.00</td>
<td>134 3</td>
<td>0</td>
<td>0</td>
<td>46 134</td>
<td>1.00 1.00</td>
<td>1.00 1.00</td>
<td>137</td>
<td>6 1 8</td>
<td>46 134</td>
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<tr>
<td>East</td>
<td>151 4</td>
<td>1.00 1.00</td>
<td>151 4</td>
<td>11</td>
<td>0</td>
<td>46 134</td>
<td>1.00 1.00</td>
<td>1.00 1.00</td>
<td>159</td>
<td>6 1 8</td>
<td>46 134</td>
</tr>
<tr>
<td>West</td>
<td>1</td>
<td>1.00 1.00</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>46 134</td>
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<td>1.00 1.00</td>
<td>159</td>
<td>6 1 8</td>
<td>46 134</td>
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**Capacity Module**

<table>
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<tr>
<th>Movement</th>
<th>Conflict Vol</th>
<th>Potent Cap</th>
<th>Move Cap</th>
<th>Volume/Cap</th>
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<td>North</td>
<td>1424</td>
<td>1459</td>
<td>544</td>
<td>0.03</td>
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<tr>
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<td>1459</td>
<td>544</td>
<td>0.03</td>
</tr>
<tr>
<td>East</td>
<td>1424</td>
<td>1459</td>
<td>544</td>
<td>0.03</td>
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<tr>
<td>West</td>
<td>1424</td>
<td>1459</td>
<td>544</td>
<td>0.03</td>
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**Level Of Service Module**

<table>
<thead>
<tr>
<th>Movement</th>
<th>2Way95thq</th>
<th>Control Del</th>
<th>LOS by Move</th>
<th>Note</th>
</tr>
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<tbody>
<tr>
<td>North</td>
<td>0.1</td>
<td>7.6</td>
<td>A</td>
<td></td>
</tr>
<tr>
<td>South</td>
<td>0.0</td>
<td>7.5</td>
<td>A</td>
<td></td>
</tr>
<tr>
<td>East</td>
<td>0.0</td>
<td>7.5</td>
<td>A</td>
<td></td>
</tr>
<tr>
<td>West</td>
<td>0.0</td>
<td>7.5</td>
<td>A</td>
<td></td>
</tr>
</tbody>
</table>

**Peak Hour Delay Signal Warrant Report**

Intersection #1 Park Blvd & Sherman Ave

Future Volume Alternative: Peak Hour Warrant NOT Met
Approach: | North Bound | South Bound | East Bound | West Bound
Movement: | L - T - R | L - T - R | L - T - R | L - T - R
Control: | Uncontrolled | Uncontrolled | Stop Sign | Stop Sign
Lanes: | 0 0 1! 0 0 0 0 1! 0 0 | 0 0 1! | 0 0 | 0 0 1! 0 0
Initial Vol: | 46 134 | 3 | 4 151 | 15 12 0 51 | 6 1 8
ApproachDel: | xxxxxx | xxxxxx

Approach[eastbound][lanes=1][control=Stop Sign]
Signal Warrant Rule #1: [vehicle-hours=0.2]
FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=63]
FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=4][total volume=431]
FAIL - Total volume less than 650 for intersection with less than four approaches.

Approach[westbound][lanes=1][control=Stop Sign]
Signal Warrant Rule #1: [vehicle-hours=0.0]
FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=15]
FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=4][total volume=431]
FAIL - Total volume less than 650 for intersection with less than four approaches.

SIGNAL WARRANT DISCLAIMER
This peak hour signal warrant analysis should be considered solely as an "indicator" of the likelihood of an unsignalized intersection warranting a traffic signal in the future. Intersections that exceed this warrant are probably more likely to meet one or more of the other volume based signal warrant (such as the 4-hour or 8-hour warrants).

The peak hour warrant analysis in this report is not intended to replace a rigorous and complete traffic signal warrant analysis by the responsible jurisdiction. Consideration of the other signal warrants, which is beyond the scope of this software, may yield different results.

Intersection #1 Park Blvd & Sherman Ave
Future Volume Alternative: Peak Hour Warrant MET

Approach: | North Bound | South Bound | East Bound | West Bound
Movement: | L - T - R | L - T - R | L - T - R | L - T - R
Control: | Uncontrolled | Uncontrolled | Stop Sign | Stop Sign
Lanes: | 0 0 1! 0 0 0 0 1! 0 0 | 0 0 1! | 0 0 | 0 0 1! 0 0
Initial Vol: | 46 134 | 3 | 4 151 | 15 12 0 51 | 6 1 8
Major Street Volume: | 353
Minor Approach Volume: | 63
Minor Approach Volume Threshold: 497

SIGNAL WARRANT DISCLAIMER
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### Intersection #2: Park Blvd & Page Mill Rd

**Traffic Volume and Capacity Calculation**

#### Final Volume Calculation

<table>
<thead>
<tr>
<th>Signal Type</th>
<th>Final Vol</th>
<th>Lanes</th>
<th>Vol Cnt</th>
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<tbody>
<tr>
<td>Stop</td>
<td>65</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Stop</td>
<td>5</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Stop</td>
<td>51</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

**Cycle Time (sec):** 100

**Loss Time (sec):** 0

**Critical V/C:** 0.200

**Avg Crit Del (sec/veh):** 3.9

**Avg Delay (sec/veh):** 3.9

**LOS:** C

---

#### Traffic Volume Module

<table>
<thead>
<tr>
<th>Movement</th>
<th>North Bound</th>
<th>South Bound</th>
<th>East Bound</th>
<th>West Bound</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lanes</td>
<td>153 134</td>
<td>153 134</td>
<td>153 134</td>
<td>153 134</td>
</tr>
<tr>
<td>Base Vol</td>
<td>153 134</td>
<td>153 134</td>
<td>153 134</td>
<td>153 134</td>
</tr>
<tr>
<td>Growth Adj</td>
<td>1.00 1.00</td>
<td>1.00 1.00</td>
<td>1.00 1.00</td>
<td>1.00 1.00</td>
</tr>
<tr>
<td>Initial Bse</td>
<td>153 134</td>
<td>153 134</td>
<td>153 134</td>
<td>153 134</td>
</tr>
<tr>
<td>Added Vol</td>
<td>0 0 0 0</td>
<td>0 0 0 0</td>
<td>0 0 0 0</td>
<td>0 0 0 0</td>
</tr>
<tr>
<td>PasserByVol</td>
<td>0 0 0 0</td>
<td>0 0 0 0</td>
<td>0 0 0 0</td>
<td>0 0 0 0</td>
</tr>
<tr>
<td>Initial Fut</td>
<td>153 134</td>
<td>153 134</td>
<td>153 134</td>
<td>153 134</td>
</tr>
<tr>
<td>User Adj</td>
<td>1.00 1.00</td>
<td>1.00 1.00</td>
<td>1.00 1.00</td>
<td>1.00 1.00</td>
</tr>
<tr>
<td>PHF Adj</td>
<td>1.00 1.00</td>
<td>1.00 1.00</td>
<td>1.00 1.00</td>
<td>1.00 1.00</td>
</tr>
<tr>
<td>PHF Volume</td>
<td>153 134</td>
<td>153 134</td>
<td>153 134</td>
<td>153 134</td>
</tr>
<tr>
<td>Reduct Vol</td>
<td>0 0 0 0</td>
<td>0 0 0 0</td>
<td>0 0 0 0</td>
<td>0 0 0 0</td>
</tr>
<tr>
<td>FinalVolume</td>
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<td>153 134</td>
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</table>

---

#### Critical Gap Module

<table>
<thead>
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<th>Critical Gp</th>
<th>4.1 xxxx xxxx</th>
<th>4.1 xxxx xxxx</th>
<th>7.1 6.5 6.2</th>
<th>7.1 6.5 6.2</th>
</tr>
</thead>
<tbody>
<tr>
<td>FollowUpTim</td>
<td>2.2 xxxx xxxx</td>
<td>2.2 xxxx xxxx</td>
<td>3.5 4.0 3.3</td>
<td>3.5 4.0 3.3</td>
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</tbody>
</table>

---

#### Capacity Module

<table>
<thead>
<tr>
<th>Cnflict Vol</th>
<th>427 xxxx xxxx</th>
<th>141 xxxx xxxx</th>
<th>673 674 221</th>
<th>802 877 138</th>
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<tbody>
<tr>
<td>Potent Cap.</td>
<td>1143 xxxx xxxx</td>
<td>1455 xxxx xxxx</td>
<td>372 379 824</td>
<td>305 289 916</td>
</tr>
<tr>
<td>Move Cap.</td>
<td>1143 xxxx xxxx</td>
<td>1455 xxxx xxxx</td>
<td>325 323 824</td>
<td>251 246 916</td>
</tr>
<tr>
<td>Volume/Cap.</td>
<td>0.13 xxxx xxxx</td>
<td>0.00 xxxx xxxx</td>
<td>0.20 0.02 0.06</td>
<td>0.01 0.02 0.00</td>
</tr>
</tbody>
</table>

---

#### Level Of Service Module

<table>
<thead>
<tr>
<th>2Way95thQ</th>
<th>0.5 xxxx xxxx</th>
<th>0.0 xxxx xxxx</th>
<th>0.7 xxxx xxxx</th>
<th>0.0 xxxx xxxx</th>
</tr>
</thead>
</table>

**Control Del:** 8.6 xxxx xxxx | 19.8 xxxx xxxx | 19.5 xxxx xxxx |

**LOS by Move:**

- **A:** LT - LTR - RT
- **C:** LT - LTR - RT

**Shared Cap.:**

- **xxx:** xxxx xxxx | xxxx xxxx | xxxx xxxx | xxxx xxxx | 723 xxxx xxxx | 289 |
- **SharedQueue:**

- **Shrd ConDel:**

- **Shared LOS:**

**Approach Del:**

- **Approach LOS:**

**Note:** Queue reported is the number of cars per lane.

---

**Peak Hour Delay Signal Warrant Report**

---

**Intersection #2 Park Blvd & Page Mill Rd**

---

**Future Volume Alternative:** Peak Hour Warrant NOT Met
### Approach: North Bound | South Bound | East Bound | West Bound
---|---|---|---
**Movement:** | L - T - R | L - T - R | L - T - R | L - T - R
---|---|---|---|---
**Control:** | Uncontrolled | Uncontrolled | Stop Sign | Stop Sign
---|---|---|---|---
**Lanes:** | 0 0 1! 0 0 | 0 1 0 0 1 | 1 0 0 1 0 | 1 0 0 1 0
---|---|---|---|---
**Initial Vol:** | 153 134 7 | 3 221 206 65 5 51 | 3 4 1 | 1
---|---|---|---|---
**Approach Del:** | xxxxxxx | xxxxxxx | 14.9 | 18.4
---|---|---|---|---
Approach[eastbound][lanes=2][control=Stop Sign]

**Signal Warrant Rule #1:** [vehicle-hours=0.5]
FAIL - Vehicle-hours less than 5 for two or more lane approach.

**Signal Warrant Rule #2:** [approach volume=121]
FAIL - Approach volume less than 150 for two or more lane approach.

**Signal Warrant Rule #3:** [approach count=4][total volume=853]
SUCCEED - Total volume greater than or equal to 800 for intersection with four or more approaches.

---

Approach[westbound][lanes=2][control=Stop Sign]

**Signal Warrant Rule #1:** [vehicle-hours=0.0]
FAIL - Vehicle-hours less than 5 for two or more lane approach.

**Signal Warrant Rule #2:** [approach volume=8]
FAIL - Approach volume less than 150 for two or more lane approach.

**Signal Warrant Rule #3:** [approach count=4][total volume=853]
SUCCEED - Total volume greater than or equal to 800 for intersection with four or more approaches.

---

**SIGNAL WARRANT DISCLAIMER**
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---

**Intersection #2 Park Blvd & Page Mill Rd**

---

**Future Volume Alternative:** Peak Hour Warrant NOT Met

---

**Approach:** North Bound | South Bound | East Bound | West Bound
---|---|---|---
**Movement:** | L - T - R | L - T - R | L - T - R | L - T - R
---|---|---|---|---
**Control:** | Uncontrolled | Uncontrolled | Stop Sign | Stop Sign
---|---|---|---|---
**Lanes:** | 0 0 1! 0 0 | 0 1 0 0 1 | 1 0 0 1 0 | 1 0 0 1 0
---|---|---|---|---
**Initial Vol:** | 153 134 7 | 3 221 206 65 5 51 | 3 4 1 | 1
---|---|---|---|---
**Major Street Volume:** | 724
---|---|---|---|---
**Minor Approach Volume:** | 121
---|---|---|---|---
**Minor Approach Volume Threshold:** | 513
---

**SIGNAL WARRANT DISCLAIMER**
This peak hour signal warrant analysis should be considered solely as an "indicator" of the likelihood of an unsignalized intersection warranting a traffic signal in the future. Intersections that exceed this warrant are probably more likely to meet one or more of the other volume based signal warrant (such as the 4-hour or 8-hour warrants).

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Intersection #2: Park Blvd & Page Mill Rd

Street Name: Park Blvd
Approach: North Bound South Bound East Bound West Bound
Movement: L - T - R L - T - R L - T - R L - T - R

Volume Module:
Base Vol: 153 134 7 3 221 206 65 5 51 3 4 1
Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse: 153 134 7 3 221 206 65 5 51 3 4 1
Added Vol: 0 0 0 0 0 0 2 0 0 0 0 0
PasserByVol: 0 0 0 0 0 0 0 0 0 0 0 0
Initial Fut: 153 134 7 3 221 220 67 5 51 3 4 1
User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Volume: 153 134 7 3 221 220 67 5 51 3 4 1
Reduct Vol: 0 0 0 0 0 0 0 0 0 0 0 0
FinalVolume: 153 134 7 3 221 220 67 5 51 3 4 1

Critical Gap Module:
Critical Gp: 4.1 xxxx xxxx 4.1 xxxx xxxx 7.1 6.5 6.2 7.1 6.5 6.2
FollowUpTim: 2.2 xxxx xxxx 2.2 xxxx xxxx 3.5 4.0 3.3 3.5 4.0 3.3

Capacity Module:
Cnflict Vol: 441 xxxx xxxx 141 xxxx xxxx 673 674 221 809 891 138
Potent Cap.: 1130 xxxx xxxx 1455 xxxx xxxx 372 379 824 302 284 916
Move Cap.: 1130 xxxx xxxx 1455 xxxx xxxx 325 322 824 247 241 916
Volume/Cap: 0.14 xxxx xxxx 0.00 xxxx xxxx 0.21 0.02 0.06 0.01 0.02 0.00

Level Of Service Module:
2Way95thQ: 0.5 xxxx xxxx 0.0 xxxx xxxx 0.8 xxxx xxxx 0.0 xxxx xxxx
Control Del: 8.7 xxxx xxxx 7.5 xxxx xxxx 19.0 xxxx xxxx 19.7 xxxx xxxx
LOS by Move: A * A * A * C * * C *
Movement: LT - LTR - RT LT - LTR - RT LT - LTR - RT LT - LTR - RT
Shared Cap.: xxxx xxxx xxxx xxxx xxxx xxxx xxxx 723 xxxx xxxx 283
SharedQueue xxxx xxxx xxxx xxxx xxxx xxxx xxxx 0.3 xxxx xxxx 0.1
Shrd ConDel:xxxxx xxxx xxxx 7.5 xxxx xxxx xxxx xxxx 10.4 xxxx xxxx 17.9
Shared LOS: * * * A * * * B * * C
ApproachDel: xxxxxx xxxxxx 15.1 18.6
ApproachLOS: * C C
Note: Queue reported is the number of cars per lane.
Approach:  North Bound  |  South Bound  |  East Bound  |  West Bound  
Movement:  L - T - R  |  L - T - R  |  L - T - R  |  L - T - R  
Control:  Uncontrolled  |  Uncontrolled  |  Stop Sign  |  Stop Sign  
Lanes:  0 0 1! 0 0 0 1 0 0 1 0 1 0 0 1 0 1 0 0 1 0  
Initial Vol:  153 134 7 3 221 220 67 5 51 3 4 1  
Approach Del:  xxxxxx xxxxxx 15.1 18.6  

Approach[east bound][lanes=2][control=Stop Sign] 
Signal Warrant Rule #1: [vehicle-hours=0.5]  
FAIL - Vehicle-hours less than 5 for two or more lane approach.  
Signal Warrant Rule #2: [approach volume=123]  
FAIL - Approach volume less than 150 for two or more lane approach.  
Signal Warrant Rule #3: [approach count=4][total volume=869]  
SUCCEED - Total volume greater than or equal to 800 for intersection with four or more approaches.  

Approach[west bound][lanes=2][control=Stop Sign] 
Signal Warrant Rule #1: [vehicle-hours=0.0]  
FAIL - Vehicle-hours less than 5 for two or more lane approach.  
Signal Warrant Rule #2: [approach volume=8]  
FAIL - Approach volume less than 150 for two or more lane approach.  
Signal Warrant Rule #3: [approach count=4][total volume=869]  
SUCCEED - Total volume greater than or equal to 800 for intersection with four or more approaches.  

SIGNAL WARRANT DISCLAIMER  
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Intersection #3: Birch St & Sherman Ave

Street Name: Birch St  Sherman Ave

Approach: North Bound  South Bound  East Bound  West Bound
Movement:  L - T - R  L - T - R  L - T - R  L - T - R

Min. Green:  7  10  10  7  10  10  7  10  10

Volume Module:
Base Vol:  69  343  38  14  11  12  48  4  8  33  10
Growth Adj:  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
Initial Bse:  69  343  38  14  11  12  48  4  8  33  10
Added Vol:  0  0  0  0  0  0  0  0  0  0  0
PasserByVol:  0  0  0  0  0  0  0  0  0  0  0
Initial Fut:  69  343  38  14  11  12  48  4  8  33  10
User Adj:  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
PHF Adj:  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
PHF Volume:  69  343  38  14  11  12  48  4  8  33  10
Reduct Vol:  0  0  0  0  0  0  0  0  0  0  0
Reduced Vol:  69  343  38  14  11  12  48  4  8  33  10
PCE Adj:  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
MLF Adj:  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
FinalVolume:  69  343  38  14  11  12  48  4  8  33  10

Saturation Flow Module:
Adjustment:  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
Lanes:  0.31  1.52  0.17  1.00  0.60  0.40  0.19  0.75  0.06  0.16  0.65  0.19
Final Sat.:  219  1120  127  615  426  284  126  504  42  107  439  133

Capacity Analysis Module:
Vol/Sat:  0.32  0.31  0.30  0.05  0.03  0.04  0.10  0.10  0.10  0.08  0.08  0.08
Crit Moves:  ****  ****  ****  ****
Delay/Veh:  9.9  9.6  9.4  8.7  7.8  7.8  8.5  8.5  8.5  8.4  8.4  8.4
Delay Adj:  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
AdjDel/Veh:  9.9  9.6  9.4  8.7  7.8  7.8  8.5  8.5  8.5  8.4  8.4  8.4
LOS by Move:  A  A  A  A  A  A  A  A  A  A  A  A
ApproachDel:  9.7  8.3  8.5  8.4
Delay Adj:  1.00  1.00  1.00
ApprAdjDel:  9.7  8.3  8.5  8.4
LOS by Appr:  A  A  A  A
AllWayAvgQ:  0.4  0.4  0.4  0.0  0.0  0.1  0.1  0.1  0.1  0.1  0.1
Note: Queue reported is the number of cars per lane.

Peak Hour Volume Signal Warrant Report [Urban]

Intersection #3 Birch St & Sherman Ave

*******************************
Future Volume Alternative: Peak Hour Warrant NOT Met

<table>
<thead>
<tr>
<th>Approach:</th>
<th>North Bound</th>
<th>South Bound</th>
<th>East Bound</th>
<th>West Bound</th>
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<tbody>
<tr>
<td>Movement:</td>
<td>L - T - R</td>
<td>L - T - R</td>
<td>L - T - R</td>
<td>L - T - R</td>
</tr>
<tr>
<td>Control:</td>
<td>Stop Sign</td>
<td>Stop Sign</td>
<td>Stop Sign</td>
<td>Stop Sign</td>
</tr>
<tr>
<td>Lanes:</td>
<td>0 1 0 1 0</td>
<td>0 1 0 1 0</td>
<td>0 0 1! 0 0</td>
<td>0 0 1! 0 0</td>
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<tr>
<td>Initial Vol:</td>
<td>69 343 38</td>
<td>30 14 11 12</td>
<td>48 4 8 33</td>
<td>10 10 10</td>
</tr>
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</table>

Major Street Volume: 505
Minor Approach Volume: 64
Minor Approach Volume Threshold: 520

SIGNAL WARRANT DISCLAIMER

This peak hour signal warrant analysis should be considered solely as an "indicator" of the likelihood of an unsignalized intersection warranting a traffic signal in the future. Intersections that exceed this warrant are probably more likely to meet one or more of the other volume based signal warrant (such as the 4-hour or 8-hour warrants).

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### Intersection #3: Birch St & Sherman Ave

<table>
<thead>
<tr>
<th>Final Vol:</th>
<th>Lanes:</th>
<th>Signal=Stop/Rights=Include</th>
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</thead>
<tbody>
<tr>
<td>22</td>
<td>0</td>
<td>21</td>
</tr>
<tr>
<td>43***</td>
<td>0</td>
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<table>
<thead>
<tr>
<th>Final Vol:</th>
<th>Lanes:</th>
<th>Signal=Stop/Rights=Include</th>
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<tbody>
<tr>
<td>20</td>
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<tr>
<td>65</td>
<td>11</td>
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</tr>
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<td>7***</td>
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<thead>
<tr>
<th>Street Name:</th>
<th>Birch St</th>
<th>Sherman Ave</th>
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<tbody>
<tr>
<td>Approach:</td>
<td>North Bound</td>
<td>South Bound</td>
</tr>
<tr>
<td>Movement:</td>
<td>L - T - R</td>
<td>L - T - R</td>
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<tr>
<td>Min. Green:</td>
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<th>Volume Module:</th>
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<tr>
<td>Base Vol: 69 343 38 30 14 11 12 48 4 8 33 10</td>
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<tr>
<td>Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00</td>
</tr>
<tr>
<td>Initial Bse: 69 343 38 30 14 11 12 48 4 8 33 10</td>
</tr>
<tr>
<td>Added Vol: 0 4 16 13 7 11 8 17 3 6 22 6</td>
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<tr>
<td>PasserByVol: 0 0 0 0 0 0 0 0 0 0 0 0</td>
</tr>
<tr>
<td>Initial Fut: 69 347 54 43 21 22 20 65 7 14 55 16</td>
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<tr>
<td>User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00</td>
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<tr>
<td>PHF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00</td>
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<tr>
<td>PHF Volume: 69 347 54 43 21 22 20 65 7 14 55 16</td>
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<tr>
<td>Reduct Vol: 0 0 0 0 0 0 0 0 0 0 0 0</td>
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<tr>
<td>Reduced Vol: 69 347 54 43 21 22 20 65 7 14 55 16</td>
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<tr>
<td>PCE Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00</td>
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<td>MLF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00</td>
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<table>
<thead>
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<th>Capacity Analysis Module:</th>
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<tr>
<td>Final Sat.: 200 1039 166 586 333 349 141 457 49 108 423 123</td>
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</tbody>
</table>

| Note: Queue reported is the number of cars per lane. |

### Peak Hour Volume Signal Warrant Report [Urban]
Future Volume Alternative: Peak Hour Warrant NOT Met

Approach: North Bound South Bound East Bound West Bound
Movement: L - T - R L - T - R L - T - R L - T - R
Control: Stop Sign Stop Sign Stop Sign Stop Sign
Lanes: 0 1 0 1 0 0 1 0 1 0 0 0 1! 0 0
Initial Vol: 69 347 54 43 21 22 20 65 7 14 55 16

Major Street Volume: 556
Minor Approach Volume: 92
Minor Approach Volume Threshold: 487

SIGNAL WARRANT DISCLAIMER
This peak hour signal warrant analysis should be considered solely as an "indicator" of the likelihood of an unsignalized intersection warranting a traffic signal in the future. Intersections that exceed this warrant are probably more likely to meet one or more of the other volume based signal warrant (such as the 4-hour or 8-hour warrants).

The peak hour warrant analysis in this report is not intended to replace a rigorous and complete traffic signal warrant analysis by the responsible jurisdiction. Consideration of the other signal warrants, which is beyond the scope of this software, may yield different results.
Intersection #4: Birch St & Grant Ave

Street Name: Birch St & Grant Ave
Approach: North Bound South Bound East Bound West Bound
Movement: L - T - R L - T - R L - T - R L - T - R

Volume Module:
Base Vol: 39 417 32 15 27 13 31 35 11 0 0 0
Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse: 39 417 32 15 27 13 31 35 11 0 0 0
Added Vol: 0 0 0 0 0 0 0 0 0 0 0 0
PasserByVol: 0 0 0 0 0 0 0 0 0 0 0 0
Initial Fut: 39 417 32 15 27 13 31 35 11 0 0 0
User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Volume: 39 417 32 15 27 13 31 35 11 0 0 0
Reduct Vol: 0 0 0 0 0 0 0 0 0 0 0 0
Final Volume: 39 417 32 15 27 13 31 35 11 0 0 0

Critical Gap Module:
Critical Gp: 4.1 xxxx xxxxx 4.1 xxxx xxxxx 6.8 6.5 6.9 xxxx xxxx xxxx
FollowUpTim: 2.2 xxxx xxxxx 2.2 xxxx xxxxx 3.5 4.0 3.3 xxxx xxxx xxxx

Capacity Module:
Conflict Vol: 40 xxxx xxxx 449 xxxx xxxx 350 591 20 xxxx xxxx xxxx
Potent Cap.: 1583 xxxx xxxx 1122 xxxx xxxx 626 423 1060 xxxx xxxx xxxx
Move Cap.: 1583 xxxx xxxx 1122 xxxx xxxx 608 406 1060 xxxx xxxx xxxx
Volume/Cap: 0.02 xxxx xxxx 0.01 xxxx xxxx 0.05 0.09 0.01 xxxx xxxx xxxx

Level Of Service Module:
2Way95thQ: 0.1 xxxx xxxx 0.0 xxxx xxxx xxxx xxxx xxxx xxxx xxxx xxxx
Control Del: 7.3 xxxx xxxx 8.3 xxxx xxxx xxxx xxxx xxxx xxxx xxxx xxxx
LOS by Move: A * A * A A * * * * * *
Movement: LT - LTR - RT LT - LTR - RT LT - LTR - RT LT - LTR - RT
Shared Cap.: xxxx xxxx xxxx xxxx xxxx xxxx xxxx xxxx 522 xxxx xxxx xxxx xxxx
SharedQueue: 0.1 xxxx xxxx 0.0 xxxx xxxx xxxx xxxx 0.5 xxxx xxxx xxxx xxxx
Shrd ConDel: 7.3 xxxx xxxx 8.3 xxxx xxxx xxxx xxxx 13.1 xxxx xxxx xxxx xxxx
Shared LOS: A * A * A * * * B * * *
ApproachDel: xxxxxx xxxxxx xxxxxx 13.1 xxxxxx
ApproachLOS: * B *

Note: Queue reported is the number of cars per lane.
Peak Hour Delay Signal Warrant Report

Intersection #4 Birch St & Grant Ave
Future Volume Alternative: Peak Hour Warrant NOT Met
### Approach: North Bound | South Bound | East Bound | West Bound
---|---|---|---
Movement: L - T - R | L - T - R | L - T - R | L - T - R
Control: Uncontrolled | Uncontrolled | Stop Sign | Stop Sign
Lanes: 0 1 0 1 0 | 0 1 0 1 0 | 0 0 1 | 0 0 0 0 0
Initial Vol: 39 417 32 15 27 13 31 35 11 0 0 0
ApproachDel: xxxxxx

**Approach [eastbound] [lanes=1] [control=Stop Sign]**

**Signal Warrant Rule #1:** [vehicle-hours=0.3]
FAIL - Vehicle-hours less than 4 for one lane approach.

**Signal Warrant Rule #2:** [approach volume=77]
FAIL - Approach volume less than 100 for one lane approach.

**Signal Warrant Rule #3:** [approach count=3] [total volume=620]
FAIL - Total volume less than 650 for intersection with less than four approaches.

**SIGNAL WARRANT DISCLAIMER**
This peak hour signal warrant analysis should be considered solely as an "indicator" of the likelihood of an unsignalized intersection warranting a traffic signal in the future. Intersections that exceed this warrant are probably more likely to meet one or more of the other volume based signal warrant (such as the 4-hour or 8-hour warrants).

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---

### Intersection #4 Birch St & Grant Ave

**Future Volume Alternative: Peak Hour Warrant NOT Met**

---|---|---|---
Approach: North Bound | South Bound | East Bound | West Bound
Movement: L - T - R | L - T - R | L - T - R | L - T - R
Control: Uncontrolled | Uncontrolled | Stop Sign | Stop Sign
Lanes: 0 1 0 1 0 | 0 1 0 1 0 | 0 0 1 | 0 0 0 0 0
Initial Vol: 39 417 32 15 27 13 31 35 11 0 0 0
Major Street Volume: 543
Minor Approach Volume: 77
Minor Approach Volume Threshold: 495

**SIGNAL WARRANT DISCLAIMER**
This peak hour signal warrant analysis should be considered solely as an "indicator" of the likelihood of an unsignalized intersection warranting a traffic signal in the future. Intersections that exceed this warrant are probably more likely to meet one or more of the other volume based signal warrant (such as the 4-hour or 8-hour warrants).

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Intersection #4: Birch St & Grant Ave

**Level Of Service Computation Report**

**Future Volume Alternative**

**Existing AM**

**Existing+Project AM**

**Intersection #4: Birch St & Grant Ave**

**Street Name:** Birch St & Grant Ave

**Approach:**

- **North Bound**
  - Movement: L - T - R
  - **Street Name:** Birch St
  - **Volume Module:**
    - **Base Vol:** 39 417 32 15 27 13 31 35 11 0 0 0
    - **Growth Adj:** 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
    - **Initial Bse:** 39 417 32 15 27 13 31 35 11 0 0 0
    - **Added Vol:** 0 20 0 2 11 0 0 0 0 0 0 0
    - **PasserByVol:** 0 0 0 0 0 0 0 0 0 0 0 0
    - **Initial Fut:** 39 437 32 17 38 13 31 35 11 0 0 0
    - **User Adj:** 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
    - **PHF Adj:** 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
    - **PHF Volume:** 39 437 32 17 38 13 31 35 11 0 0 0
    - **Reduct Vol:** 0 0 0 0 0 0 0 0 0 0 0 0
    - **Final Volume:** 39 437 32 17 38 13 31 35 11 0 0 0

- **South Bound**
  - Movement: L - T - R
  - **Street Name:** South Bound
  - **Volume Module:**
    - **Base Vol:** 39 417 32 15 27 13 31 35 11 0 0 0
    - **Growth Adj:** 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
    - **Initial Bse:** 39 417 32 15 27 13 31 35 11 0 0 0
    - **Added Vol:** 0 20 0 2 11 0 0 0 0 0 0 0
    - **PasserByVol:** 0 0 0 0 0 0 0 0 0 0 0 0
    - **Initial Fut:** 39 437 32 17 38 13 31 35 11 0 0 0
    - **User Adj:** 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
    - **PHF Adj:** 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
    - **PHF Volume:** 39 437 32 17 38 13 31 35 11 0 0 0
    - **Reduct Vol:** 0 0 0 0 0 0 0 0 0 0 0 0
    - **Final Volume:** 39 437 32 17 38 13 31 35 11 0 0 0

- **East Bound**
  - Movement: L - T - R
  - **Street Name:** East Bound
  - **Volume Module:**
    - **Base Vol:** 39 417 32 15 27 13 31 35 11 0 0 0
    - **Growth Adj:** 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
    - **Initial Bse:** 39 417 32 15 27 13 31 35 11 0 0 0
    - **Added Vol:** 0 20 0 2 11 0 0 0 0 0 0 0
    - **PasserByVol:** 0 0 0 0 0 0 0 0 0 0 0 0
    - **Initial Fut:** 39 437 32 17 38 13 31 35 11 0 0 0
    - **User Adj:** 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
    - **PHF Adj:** 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
    - **PHF Volume:** 39 437 32 17 38 13 31 35 11 0 0 0
    - **Reduct Vol:** 0 0 0 0 0 0 0 0 0 0 0 0
    - **Final Volume:** 39 437 32 17 38 13 31 35 11 0 0 0

- **West Bound**
  - Movement: L - T - R
  - **Street Name:** West Bound
  - **Volume Module:**
    - **Base Vol:** 39 417 32 15 27 13 31 35 11 0 0 0
    - **Growth Adj:** 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
    - **Initial Bse:** 39 417 32 15 27 13 31 35 11 0 0 0
    - **Added Vol:** 0 20 0 2 11 0 0 0 0 0 0 0
    - **PasserByVol:** 0 0 0 0 0 0 0 0 0 0 0 0
    - **Initial Fut:** 39 437 32 17 38 13 31 35 11 0 0 0
    - **User Adj:** 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
    - **PHF Adj:** 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
    - **PHF Volume:** 39 437 32 17 38 13 31 35 11 0 0 0
    - **Reduct Vol:** 0 0 0 0 0 0 0 0 0 0 0 0
    - **Final Volume:** 39 437 32 17 38 13 31 35 11 0 0 0

**Critical Gap Module:**

- **Critical Gp:** 4.1 xxxx xxxx xxxx 4.1 xxxx xxxx xxxx 6.8 6.5 6.9 xxxx xxxx xxxx
- **FollowUpTim:** 2.2 xxxx xxxx xxxx 2.2 xxxx xxxx xxxx 3.5 4.0 3.3 xxxx xxxx xxxx

**Capacity Module:**

- **Cnflict Vol:** 51 xxxx xxxx xxxx 469 xxxx xxxx xxxx 375 626 26 xxxx xxxx xxxx
- **Potent Cap.:** 1568 xxxx xxxx xxxx 1103 xxxx xxxx xxxx 604 404 1051 xxxx xxxx xxxx
- **Move Cap.:** 1568 xxxx xxxx xxxx 1103 xxxx xxxx xxxx 585 387 1051 xxxx xxxx xxxx
- **Volume/Cap:** 0.02 xxxx xxxx xxxx 0.02 xxxx xxxx xxxx 0.05 0.09 0.01 xxxx xxxx xxxx

**Level Of Service Module:**

- **2Way95thQ:** 0.1 xxxx xxxx xxxx 0.0 xxxx xxxx xxxx xxxx xxxx xxxx 0.1 xxxx xxxx xxxx
- **Control Del:** 7.4 xxxx xxxx xxxx 8.3 xxxx xxxx xxxx xxxx xxxx xxxx
- **LOS by Move:**
  - **A:**
  - **B:**

**Movement:**

- **LT - LTR - RT**
- **LT - LTR - RT**
- **LT - LTR - RT**
- **LT - LTR - RT**

**Shared Cap.:**

- **SharedQueue:**
- **Shrd ConDel:**
- **Shared LOS:**

**Approach Del:**

- **Approach LOS:**

**Note:** Queue reported is the number of cars per lane.

Peak Hour Delay Signal Warrant Report

Future Volume Alternative: Peak Hour Warrant NOT Met
### Approach: North Bound | South Bound | East Bound | West Bound
---|---|---|---
Movement: | L - T - R | L - T - R | L - T - R | L - T - R
Control: | Uncontrolled | Uncontrolled | Stop Sign | Stop Sign
Lanes: | 0 1 0 1 0 | 0 1 0 1 0 | 0 0 1 0 0 | 0 0 0 0 0
Initial Vol: | 39 437 32 17 38 13 31 35 11 0 0 0 | 0 0 0 0 0 0 0 0 0 0 0 0
Approach Del: | xxxxxx | xxxxxx | 13.5 | xxxxxx

**Signal Warrant Rule #1:** [vehicle-hours=0.3]
FAIL - Vehicle-hours less than 4 for one lane approach.

**Signal Warrant Rule #2:** [approach volume=77]
FAIL - Approach volume less than 100 for one lane approach.

**Signal Warrant Rule #3:** [approach count=3][total volume=653]
SUCCEED - Total volume greater than or equal to 650 for intersection with less than four approaches.

**SIGNAL WARRANT DISCLAIMER**
This peak hour signal warrant analysis should be considered solely as an "indicator" of the likelihood of an unsignalized intersection warranting a traffic signal in the future. Intersections that exceed this warrant are probably more likely to meet one or more of the other volume based signal warrant (such as the 4-hour or 8-hour warrants).

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### Intersection #4 Birch St & Grant Ave

**Future Volume Alternative: Peak Hour Warrant NOT Met**

---|---|---|---
Approach: | North Bound | South Bound | East Bound | West Bound
Movement: | L - T - R | L - T - R | L - T - R | L - T - R
Control: | Uncontrolled | Uncontrolled | Stop Sign | Stop Sign
Lanes: | 0 1 0 1 0 | 0 1 0 1 0 | 0 0 1 0 0 | 0 0 0 0 0
Initial Vol: | 39 437 32 17 38 13 31 35 11 0 0 0 | 0 0 0 0 0 0 0 0 0 0 0 0
Major Street Volume: | 576
Minor Approach Volume: | 77
Minor Approach Volume Threshold: 475

**SIGNAL WARRANT DISCLAIMER**
This peak hour signal warrant analysis should be considered solely as an "indicator" of the likelihood of an unsignalized intersection warranting a traffic signal in the future. Intersections that exceed this warrant are probably more likely to meet one or more of the other volume based signal warrant (such as the 4-hour or 8-hour warrants).

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### Intersection #5: Birch St & Sheridan Ave

#### Level of Service Computation Report
2000 HCM Unsignalized (Future Volume Alternative)
Existing AM

<table>
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<tr>
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<th>North Bound</th>
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<th>East Bound</th>
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<tr>
<td>L - T - R</td>
<td>L - T - R</td>
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<tbody>
<tr>
<td>Base Vol:</td>
<td>144 477 246</td>
<td>20 13 4</td>
<td>9 36 2 8 14 6</td>
<td></td>
</tr>
<tr>
<td>Growth Adj:</td>
<td>1.00 1.00 1.00</td>
<td>1.00 1.00 1.00</td>
<td>1.00 1.00 1.00</td>
<td>1.00 1.00 1.00</td>
</tr>
<tr>
<td>Initial Bse:</td>
<td>144 477 246</td>
<td>20 13 4</td>
<td>9 36 2 8 14 6</td>
<td></td>
</tr>
<tr>
<td>Added Vol:</td>
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<td>0 0 0 0 0 0</td>
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<td>Initial Fut:</td>
<td>144 477 246</td>
<td>20 13 4</td>
<td>9 36 2 8 14 6</td>
<td></td>
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<tr>
<td>User Adj:</td>
<td>1.00 1.00 1.00</td>
<td>1.00 1.00 1.00</td>
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<td>1.00 1.00 1.00</td>
<td>1.00 1.00 1.00</td>
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<td>PHF Volume:</td>
<td>144 477 246</td>
<td>20 13 4</td>
<td>9 36 2 8 14 6</td>
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<tr>
<td>Reduct Vol:</td>
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<td>4.1 xxxx xxxx</td>
<td>7.1 6.5 6.2</td>
<td>7.1 6.5 6.2</td>
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<td>FollowUpTim:</td>
<td>2.2 xxxx xxxx</td>
<td>2.2 xxxx xxxx</td>
<td>3.5 4.0 3.3</td>
<td>3.5 4.0 3.3</td>
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<tr>
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<td>953 1066 9</td>
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<td>Potent Cap.:</td>
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<td>241 224 1079</td>
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<td>Move Cap.:</td>
<td>1613 xxxx xxxx</td>
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<td>Volume/Cap:</td>
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<td>0.02 xxxx xxxx</td>
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<td>A *</td>
<td>A *</td>
<td>A *</td>
<td>A *</td>
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<tr>
<td>Movement:</td>
<td>LT - LTR - RT</td>
<td>LT - LTR - RT</td>
<td>LT - LTR - RT</td>
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<tr>
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<td>0.1 xxxx xxxx</td>
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<td>0.4 xxxx xxxx</td>
</tr>
<tr>
<td>Shrd ConDel:</td>
<td>9.1 xxxx xxxx</td>
<td>9.1 xxxx xxxx</td>
<td>27.5 xxxx xxxx</td>
<td>21.6 xxxx xxxx</td>
</tr>
<tr>
<td>Shared LOS:</td>
<td>* A *</td>
<td>* A *</td>
<td>* D *</td>
<td>* C *</td>
</tr>
<tr>
<td>ApproachDel:</td>
<td>xxxxxxx xxxxxxx</td>
<td>27.5 21.6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ApproachLOS:</td>
<td>* D C</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: Queue reported is the number of cars per lane.

Future Volume Alternative: Peak Hour Warrant NOT Met
Approach: | North Bound | South Bound | East Bound | West Bound
Movement: | L - T - R | L - T - R | L - T - R | L - T - R
Control: | Uncontrolled | Uncontrolled | Stop Sign | Stop Sign
Lanes: | 0 0 1! 0 0 0 1 0 1 0 0 0 1! 0 0 0 0 1! 0 0
Initial Vol: | 144 477 246 | 20 13 4 9 36 2 8 14 6
Approach Del: | xxxxxx | 27.5 | 21.6

Approach [eastbound] [lanes=1] [control=Stop Sign]
Signal Warrant Rule #1: [vehicle-hours=0.4]
FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=47]
FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=4][total volume=979]
SUCCEED - Total volume greater than or equal to 800 for intersection with four or more approaches.

Approach [westbound] [lanes=1] [control=Stop Sign]
Signal Warrant Rule #1: [vehicle-hours=0.2]
FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=28]
FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=4][total volume=979]
SUCCEED - Total volume greater than or equal to 800 for intersection with four or more approaches.

SIGNAL WARRANT DISCLAIMER
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### Intersection #5: Birch St & Sheridan Ave

**Final Vol:**
- **Lanes:** 0 1 0 1 0
- **Signal=Stop/Rights=Include**
- **Vol Cnt Date:** n/a
- **Cycle Time (sec):** 100
- **Loss Time (sec):** 0
- **Critical V/C:** 0.190
- **Critical Cnt Del (sec/veh):** 3.2
- **Avg Delay (sec/veh):** 3.2
- **LOS:** D

**Street Name:**
- Birch St
- Sheridan Ave

**Approach:**
- **North Bound**
- **South Bound**
- **East Bound**
- **West Bound**

**Movement:**
- L  -  T  -  R
- L  -  T  -  R
- L  -  T  -  R
- L  -  T  -  R

**Volume Module:**
- **Base Vol:**
  - 144 477 246 20 13 4 9 36 2 8 14 6
- **Growth Adj:**
  - 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
- **Initial Bse:**
  - 144 477 246 20 13 4 9 36 2 8 14 6
- **Added Vol:**
  - 0 20 0 0 11 0 0 0 0 0 0 0
- **PasserByVol:**
  - 0 0 0 0 0 0 0 0 0 0 0 0
- **Initial Fut:**
  - 144 497 246 20 24 4 9 36 2 8 14 6
- **User Adj:**
  - 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
- **PHF Adj:**
  - 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
- **PHF Volume:**
  - 144 497 246 20 24 4 9 36 2 8 14 6
- **Reduct Vol:**
  - 0 0 0 0 0 0 0 0 0 0 0 0
- **Final Volume:**
  - 144 497 246 20 24 4 9 36 2 8 14 6

**Critical Gap Module:**
- **Critical Gap:**
  - 4.1 xxxx xxxxx 4.1 xxxx xxxxx 4.1 xxxx xxxxx 4.1 xxxx xxxxx 4.1 xxxx xxxxx
- **FollowUpTim:**
  - 2.2 xxxx xxxxx 2.2 xxxx xxxxx 2.2 xxxx xxxxx 2.2 xxxx xxxxx 2.2 xxxx xxxxx

**Capacity Module:**
- **Cnflict Vol:**
  - 28 xxxx xxxxx 743 xxxx xxxxx 984 1097 14 978 976 620
- **Potent Cap.:**
  - 1599 xxxx xxxxx 873 xxxx xxxxx 229 215 1072 232 253 492
- **Move Cap.:**
  - 1599 xxxx xxxxx 873 xxxx xxxxx 196 189 1072 180 223 492
- **Volume/Cap.:**
  - 0.09 xxxx xxxxx 0.02 xxxx xxxxx 0.05 0.19 0.00 0.04 0.06 0.01

**Level Of Service Module:**
- **2Way95thQ:**
  - 0.3 xxxx xxxxx 0.1 xxxx xxxxx 0.2 xxxx xxxxx 0.3 xxxx xxxxx 0.01 xxxx xxxxx
- **Control Del:**
  - 7.5 xxxx xxxxx 9.2 xxxx xxxxx 9.4 xxxx xxxxx 9.5 xxxx xxxxx 8.4 xxxx xxxxx
- **LOS by Move:**

**Note:** Queue reported is the number of cars per lane.

---

**Future Volume Alternative: Peak Hour Wait Not Met**
<table>
<thead>
<tr>
<th>Approach:</th>
<th>North Bound</th>
<th>South Bound</th>
<th>East Bound</th>
<th>West Bound</th>
</tr>
</thead>
<tbody>
<tr>
<td>Movement:</td>
<td>L - T - R</td>
<td>L - T - R</td>
<td>L - T - R</td>
<td>L - T - R</td>
</tr>
<tr>
<td>Control:</td>
<td>Uncontrolled</td>
<td>Uncontrolled</td>
<td>Stop Sign</td>
<td>Stop Sign</td>
</tr>
<tr>
<td>Lanes:</td>
<td>0 0 1! 0 0</td>
<td>0 1 0 1 0</td>
<td>0 0 1! 0 0</td>
<td>0 0 1! 0 0</td>
</tr>
<tr>
<td>Initial Vol:</td>
<td>144 497</td>
<td>246 20 24</td>
<td>4 9 36</td>
<td>2 8 14 6</td>
</tr>
<tr>
<td>Approach Del.</td>
<td>xxxxxx</td>
<td>xxxxxx</td>
<td>28.8</td>
<td>22.4</td>
</tr>
</tbody>
</table>

**Approach [eastbound][lanes=1][control=Stop Sign]**

**Signal Warrant Rule #1:** [vehicle-hours=0.4]  
FAIL - Vehicle-hours less than 4 for one lane approach.

**Signal Warrant Rule #2:** [approach volume=47]  
FAIL - Approach volume less than 100 for one lane approach.

**Signal Warrant Rule #3:** [approach count=4][total volume=1010]  
SUCCEED - Total volume greater than or equal to 800 for intersection with four or more approaches.

**Approach [westbound][lanes=1][control=Stop Sign]**

**Signal Warrant Rule #1:** [vehicle-hours=0.2]  
FAIL - Vehicle-hours less than 4 for one lane approach.

**Signal Warrant Rule #2:** [approach volume=28]  
FAIL - Approach volume less than 100 for one lane approach.

**Signal Warrant Rule #3:** [approach count=4][total volume=1010]  
SUCCEED - Total volume greater than or equal to 800 for intersection with four or more approaches.

**SIGNAL WARRANT DISCLAIMER**

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### Intersection #6: Ash St & California Ave

**Final Vol:**

<table>
<thead>
<tr>
<th>Signal=Stop</th>
<th>Rights=Include</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

**Vol Cnt Date:**

<table>
<thead>
<tr>
<th>Cycle Time (sec):</th>
</tr>
</thead>
<tbody>
<tr>
<td>100</td>
</tr>
</tbody>
</table>

**Loss Time (sec):**

| 0 |

**Critical V/C:**

| 0.223 |

**Avg Crit Del (sec/veh):**

| 8.1 |

**Avg Delay (sec/veh):**

| 8.1 |

**LOS:**

| A |

---

**Street Name:**

- Ash St
- California Ave

**Approach:**

- North Bound
- South Bound
- East Bound
- West Bound

**Movement:**

<table>
<thead>
<tr>
<th>L</th>
<th>T</th>
<th>R</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Min. Green:**

| 7 | 10 | 10 |

**Volume Module:**

- **Base Vol:**
  - 36
  - 0
  - 33
  - 0
  - 0
  - 0
  - 0
  - 85
  - 28
  - 13
  - 172
  - 0

- **Growth Adj:**
  - 1.00
  - 1.00
  - 1.00
  - 1.00
  - 1.00
  - 1.00
  - 1.00
  - 1.00
  - 1.00
  - 1.00
  - 1.00

- **Initial Base:**
  - 36
  - 0
  - 33
  - 0
  - 0
  - 0
  - 0
  - 85
  - 28
  - 13
  - 172
  - 0

- **Added Vol:**
  - 0
  - 0
  - 0
  - 0
  - 0
  - 0
  - 0
  - 0
  - 0
  - 0
  - 0

- **Passer By Vol:**
  - 0
  - 0
  - 0
  - 0
  - 0
  - 0
  - 0
  - 0
  - 0
  - 0
  - 0

- **Initial Future:**
  - 36
  - 0
  - 33
  - 0
  - 0
  - 0
  - 0
  - 85
  - 28
  - 13
  - 172
  - 0

- **User Adj:**
  - 1.00
  - 1.00
  - 1.00
  - 1.00
  - 1.00
  - 1.00
  - 1.00
  - 1.00
  - 1.00
  - 1.00
  - 1.00

- **PHF Adj:**
  - 1.00
  - 1.00
  - 1.00
  - 1.00
  - 1.00
  - 1.00
  - 1.00
  - 1.00
  - 1.00
  - 1.00
  - 1.00

- **PHF Volume:**
  - 36
  - 0
  - 33
  - 0
  - 0
  - 0
  - 0
  - 85
  - 28
  - 13
  - 172
  - 0

- **Reduced Vol:**
  - 0
  - 0
  - 0
  - 0
  - 0
  - 0
  - 0
  - 0
  - 0
  - 0
  - 0

- **PCE Adj:**
  - 1.00
  - 1.00
  - 1.00
  - 1.00
  - 1.00
  - 1.00
  - 1.00
  - 1.00
  - 1.00
  - 1.00
  - 1.00

- **PHF Adjust:**
  - 1.00
  - 1.00
  - 1.00
  - 1.00
  - 1.00
  - 1.00
  - 1.00
  - 1.00
  - 1.00
  - 1.00
  - 1.00

- **Final Volume:**
  - 36
  - 0
  - 33
  - 0
  - 0
  - 0
  - 0
  - 85
  - 28
  - 13
  - 172
  - 0

**Capacity Analysis Module:**

- **Vol/Sat:**
  - 0.09
  - xxxx
  - 0.09
  - xxxx
  - xxxx
  - xxxx
  - xxxx
  - 0.11
  - 0.03
  - 0.22
  - 0.22
  - xxxx

- **Crit Moves:**
  - ****
  - ****
  - ****

- **Delay/Veh:**
  - 7.7
  - 0.0
  - 7.7
  - 0.0
  - 0.0
  - 0.0
  - 8.1
  - 6.9
  - 8.5
  - 8.5
  - 0.0

- **Delay Adj:**
  - 1.00
  - 1.00
  - 1.00
  - 1.00
  - 1.00
  - 1.00
  - 1.00
  - 1.00
  - 1.00
  - 1.00
  - 1.00

- **Adj Del/Veh:**
  - 7.7
  - 0.0
  - 7.7
  - 0.0
  - 0.0
  - 0.0
  - 8.1
  - 6.9
  - 8.5
  - 8.5
  - 0.0

- **LOS by Move:**
  - A
  - *
  - A
  - *
  - *
  - *
  - A
  - A
  - A
  - A

- **Approach Del:**
  - 7.7
  - xxxxxx
  - 7.8
  - 8.5

- **Delay Adj:**
  - 1.00
  - xxxxxx
  - 1.00
  - 1.00

- **Appr Adj Del:**
  - 7.7
  - xxxxxx
  - 7.8
  - 8.5

- **LOS by Appr:**
  - A
  - *
  - A
  - A

- **All Way Avg Q:**
  - 0.1
  - 0.1
  - 0.1
  - 0.0
  - 0.0
  - 0.0
  - 0.0
  - 0.1
  - 0.0
  - 0.3
  - 0.3
  - 0.3

**Note:** Queue reported is the number of cars per lane.

---

**Peak Hour Volume Signal Warrant Report [Urban]**

---

**Intersection #6 Ash St & California Ave**

---
Future Volume Alternative: Peak Hour Warrant NOT Met

---|---|---|---|---
Approach: North Bound | South Bound | East Bound | West Bound
Movement: L - T - R | L - T - R | L - T - R | L - T - R
Control: Stop Sign | Stop Sign | Stop Sign | Stop Sign
Lanes: 0 0 1! 0 0 | 0 0 0 0 0 | 0 0 1 0 1 | 0 1 0 0 0
Initial Vol: 36 0 33 | 0 0 0 0 0 | 0 0 85 28 | 13 172 0

Major Street Volume: 298
Minor Approach Volume: 69
Minor Approach Volume Threshold: 702

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Intersection #6: Ash St & California Ave

Final Vol: 39
Lanes: 0 0 1 0 0 33

Street Name: Ash St California Ave

Approach:
North Bound South Bound East Bound West Bound
Movement: L - T - R L - T - R L - T - R L - T - R
Min. Green: 7 10 10 7 10 10 7 10 10

Volume Module:
Base Vol: 36 0 33 0 0 0 0 85 28 13 172 0
Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse: 36 0 33 0 0 0 0 85 28 13 172 0
Added Vol: 3 0 0 0 0 0 0 16 0 0 17 0
PasserByVol: 0 0 0 0 0 0 0 0 0 0 0 0
Initial Fut: 39 0 33 0 0 0 0 101 28 13 189 0
User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Volume: 39 0 33 0 0 0 0 101 28 13 189 0
Reduct Vol: 0 0 0 0 0 0 0 0 0 0 0 0
Reduced Vol: 39 0 33 0 0 0 0 101 28 13 189 0
PCE Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
MLF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
FinalVolume: 39 0 33 0 0 0 0 101 28 13 189 0

Saturation Flow Module:
Adjustment: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Lanes: 0.54 0.00 0.46 0.00 0.00 0.00 0.00 1.00 1.00 0.06 0.94 0.00
Final Sat.: 415 0 351 0 0 0 0 738 862 53 770 0

Capacity Analysis Module:
Vol/Sat: 0.09 xxxx 0.09 xxxx xxxx xxxx xxxx 0.14 0.03 0.25 0.25 xxxx
Crit Moves: **** **** ****
Delay/Veh: 7.9 0.0 7.9 0.0 0.0 0.0 0.0 8.2 6.9 8.7 8.7 0.0
Delay Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
AdjDel/Veh: 7.9 0.0 7.9 0.0 0.0 0.0 0.0 8.2 6.9 8.7 8.7 0.0
LOS by Move: A * A * * * A A A
ApproachDel: 7.9 xxxxxx 8.0 8.7
Delay Adj: 1.00 xxxxxx 1.00 1.00
ApprAdjDel: 7.9 xxxxxx 8.0 8.7
LOS by Appr: A
AllWayAvgQ: 0.1 0.1 0.1 0.0 0.0 0.0 0.0 0.2 0.0 0.3 0.3 0.3
Note: Queue reported is the number of cars per lane.

Peak Hour Volume Signal Warrant Report [Urban]

Intersection #6 Ash St & California Ave
Future Volume Alternative: Peak Hour Warrant NOT Met

Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
Control:        Stop Sign        Stop Sign        Stop Sign        Stop Sign
Lanes:        0  0  1! 0  0    0  0  0  0  0    0  1  0  1    0  1  0  0  0
Initial Vol:   39    0    33     0    0     0     0  101    28    13  189     0

Major Street Volume:             331
Minor Approach Volume:           72
Minor Approach Volume Threshold: 666

SIGNAL WARRANT DISCLAIMER
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"indicator" of the likelihood of an unsignalized intersection warranting
a traffic signal in the future. Intersections that exceed this warrant
are probably more likely to meet one or more of the other volume based
signal warrant (such as the 4-hour or 8-hour warrants).

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a rigorous and complete traffic signal warrant analysis by the responsible
jurisdiction. Consideration of the other signal warrants, which is beyond
the scope of this software, may yield different results.
Intersection #7: ECR & Cambridge Ave

Traffic flow data for ECR & Cambridge Ave:

**Final Volume (Future Volume Alternative):**

- Signal: Protect
- Rights: Include
- Cycle Time (sec): 150
- Loss Time (sec): 12
- Critical V/C: 0.391
- Avg Crit Del (sec/veh): 13.3
- Avg Delay (sec/veh): 14.5
- LOS: B

**Street Name:**
- ECR
- Cambridge Ave

**Approach:**
- North Bound
- South Bound
- East Bound
- West Bound

**Movement:**

<table>
<thead>
<tr>
<th>Movement</th>
<th>L</th>
<th>T</th>
<th>R</th>
<th>L</th>
<th>T</th>
<th>R</th>
<th>L</th>
<th>T</th>
<th>R</th>
<th>L</th>
<th>T</th>
<th>R</th>
</tr>
</thead>
<tbody>
<tr>
<td>Min. Green</td>
<td>7</td>
<td>10</td>
<td>10</td>
<td>7</td>
<td>10</td>
<td>10</td>
<td>7</td>
<td>10</td>
<td>10</td>
<td>7</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>Y+R</td>
<td>4.0</td>
<td>4.0</td>
<td>4.0</td>
<td>4.0</td>
<td>4.0</td>
<td>4.0</td>
<td>4.0</td>
<td>4.0</td>
<td>4.0</td>
<td>4.0</td>
<td>4.0</td>
<td>4.0</td>
</tr>
</tbody>
</table>

**Volume Module:**

- Base Vol: 17 1529 26 49 1224 42 33 9 14 28 16 94
- Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
- Initial Bse: 17 1529 26 49 1224 42 33 9 14 28 16 94
- Added Vol: 0 0 0 0 0 0 0 0 0 0 0 0
- PasserByVol: 0 0 0 0 0 0 0 0 0 0 0 0
- Initial Fut: 17 1529 26 49 1224 42 33 9 14 28 16 94
- User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
- PHF Volume: 17 1529 26 49 1224 42 33 9 14 28 16 94
- Reduct Vol: 0 0 0 0 0 0 0 0 0 0 0 0
- Reduced Vol: 17 1529 26 49 1224 42 33 9 14 28 16 94
- PCE Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
- MLP Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
- Final Volume: 17 1529 26 49 1224 42 33 9 14 28 16 94

**Saturation Flow Module:**

- Sat/Lane: 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900
- Adjustment: 0.92 0.98 0.95 0.92 0.92 0.92 0.92 0.95 0.95 0.92
- Lanes: 1.00 2.95 0.05 1.00 2.90 0.10 0.59 0.16 0.25 0.64 0.36 1.00
- Final Sat.: 1750 5506 94 1750 5414 186 1031 281 438 1145 655 1750

**Capacity Analysis Module:**

- Vol/Sat: 0.01 0.28 0.28 0.03 0.23 0.23 0.03 0.03 0.03 0.02 0.02 0.05
- Crit Moves: **** **** ****
- Green Time: 20.1 107 106.6 10.8 97.3 97.3 20.6 20.6 20.6 20.6 20.6 20.6
- Volume/Cap: 0.07 0.39 0.39 0.39 0.39 0.35 0.35 0.23 0.23 0.23 0.18 0.18 0.39
- Delay/Veh: 56.9 8.7 8.7 68.5 12.0 12.0 58.1 58.1 58.1 57.5 57.5 60.0
- User DelAdj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
- AdjDel/Veh: 56.9 8.7 8.7 68.5 12.0 12.0 58.1 58.1 58.1 57.5 57.5 60.0
- LOS by Move: E+ A A E B B E+ E+ E+ E+ E+ E
- HCM2k95thQ: 1 18 18 5 16 16 5 5 4 4 9

Note: Queue reported is the number of cars per lane.
### Intersection #7: ECR & Cambridge Ave

#### Final Vol:
- **LANES:**
  - **Final Vol:** 17 1535
  - **Final Vol:** 26
  - **Final Vol:** 17 1535

#### Signal=Protect/Rights=Include
- **Final Vol:** 17 1535
- **LANES:**
  - **Final Vol:** 17 1535

#### Cycle Time (sec): 150
- **LANES:**
  - **Final Vol:**

#### Loss Time (sec): 12
- **LANES:**
  - **Final Vol:**

#### Critical V/C: 0.392
- **LANES:**
  - **Final Vol:**

#### Avg Crt Del (sec/veh): 14.4
- **LANES:**
  - **Final Vol:**

#### Avg Delay (sec/veh): 14.4
- **LANES:**
  - **Final Vol:**

#### LOS: B
- **LANES:**
  - **Final Vol:**

### Street Name:
- **ECR**
- **Cambridge Ave**

### Approach:
- **North Bound**
- **South Bound**
- **East Bound**
- **West Bound**

### Movement:
- **L**
- **T**
- **R**

### Min. Green:
- **L:** 7 10 10 10 10 10 7 10 10 7 10 10
- **T:** 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0
- **R:**

### Base Vol:
- **LANES:**
  - **Final Vol:** 17 1529

### Growth Adj:
- **LANES:**
  - **Final Vol:** 17 1529

### Initial Bse:
- **LANES:**
  - **Final Vol:** 17 1529

### Added Vol:
- **LANES:**
  - **Final Vol:** 0 0 0 0 0 0 0 0 0 0 0 0

### PasserByVol:
- **LANES:**
  - **Final Vol:** 0 0 0 0 0 0 0 0 0 0 0 0

### Initial Fut:
- **LANES:**
  - **Final Vol:** 17 1535

### User Adj:
- **LANES:**
  - **Final Vol:** 17 1535

### PHF Volume:
- **LANES:**
  - **Final Vol:** 17 1535

### Reduct Vol:
- **LANES:**
  - **Final Vol:** 17 1535

### PCE Adj:
- **LANES:**
  - **Final Vol:** 17 1535

### FinalVolume:
- **LANES:**
  - **Final Vol:** 17 1535

### Saturation Flow Module:
- **LANES:**
  - **Final Vol:**

### Capacity Analysis Module:
- **LANES:**
  - **Final Vol:**

### Note:
Queue reported is the number of cars per lane.
Intersection #8: ECR & California Ave

<table>
<thead>
<tr>
<th>Street Name: ECR</th>
<th>California Ave</th>
</tr>
</thead>
<tbody>
<tr>
<td>Approach:</td>
<td>North Bound</td>
</tr>
<tr>
<td>Movement:</td>
<td>L - T - R</td>
</tr>
<tr>
<td>Min. Green:</td>
<td>7 10 10</td>
</tr>
<tr>
<td>Y+R:</td>
<td>4.0 4.0 4.0</td>
</tr>
</tbody>
</table>

Volume Module:

| Base Vol:       | 100 1513 54 | 60 1023 144 | 33 27 53 | 60 74 65 |
| Growth Adj:     | 1.00 1.00 1.00 | 1.00 1.00 1.00 | 1.00 1.00 1.00 | 1.00 1.00 1.00 |
| Initial Bse:    | 100 1513 54 | 60 1023 144 | 33 27 53 | 60 74 65 |
| Added Vol:      | 0 0 0 0 | 0 0 0 0 | 0 0 0 0 | 0 0 0 0 |
| PasserByVol:    | 0 0 0 0 | 0 0 0 0 | 0 0 0 0 | 0 0 0 0 |
| Initial Fut:    | 100 1513 54 | 60 1023 144 | 33 27 53 | 60 74 65 |
| User Adj:       | 1.00 1.00 1.00 | 1.00 1.00 1.00 | 1.00 1.00 1.00 | 1.00 1.00 1.00 |
| PHF Volume:     | 100 1513 54 | 60 1023 144 | 33 27 53 | 60 74 65 |
| Reduced Vol:    | 100 1513 54 | 60 1023 144 | 33 27 53 | 60 74 65 |
| PCE Adj:        | 1.00 1.00 1.00 | 1.00 1.00 1.00 | 1.00 1.00 1.00 | 1.00 1.00 1.00 |
| MLP Adj:        | 1.00 1.00 1.00 | 1.00 1.00 1.00 | 1.00 1.00 1.00 | 1.00 1.00 1.00 |
| Final Volume:   | 100 1513 54 | 60 1023 144 | 33 27 53 | 60 74 65 |

Saturation Flow Module:

| Sat/Lane:       | 1900 1900 1900 | 1900 1900 1900 | 1900 1900 1900 | 1900 1900 1900 |
| Adjustment:     | 0.92 0.98 0.95 | 0.92 0.98 0.95 | 0.92 0.98 0.95 | 0.92 0.98 0.95 |
| Lanes:          | 1.00 2.89 0.11 | 1.00 2.62 0.38 | 1.00 0.34 0.66 | 1.00 1.00 1.00 |
| Final Sat.:     | 1750 5407 193 | 1750 4908 691 | 1750 607 1192 | 1750 1900 1750 |

Capacity Analysis Module:

| Vol/Sat:        | 0.06 0.28 0.28 0.03 0.21 0.21 0.02 0.04 0.04 0.03 0.04 0.04 |
| Crit Moves:     | **** ***** ***** ***** |
| Green Time:     | 23.7 98.3 98.3 12.0 86.6 86.6 11.4 15.6 15.6 12.0 16.3 16.3 |
| Volume/Cap:     | 0.36 0.43 0.43 0.43 0.36 0.36 0.25 0.43 0.43 0.43 0.36 0.34 |
| Delay/Veh:      | 57.2 12.5 12.5 67.8 17.0 17.0 66.3 64.6 64.6 64.6 67.8 63.1 63.0 |
| User DelAdj:    | 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 |
| AdjDel/Veh:     | 57.2 12.5 12.5 67.8 17.0 17.0 66.3 64.6 64.6 64.6 67.8 63.1 63.0 |
| LOS by Move:    | E+ B B B E B B E E E E E |
| HCM2k95thQ:     | 9 21 21 5 17 17 4 8 8 7 7 6 |

Note: Queue reported is the number of cars per lane.
Intersection #8: ECR & California Ave

Street Name: ECR California Ave

Approach: North Bound South Bound East Bound West Bound
Movement: L - T - R L - T - R L - T - R L - T - R

Min. Green: 7 10 10 7 10 10 7 10 10
Y+R: 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0

Volume Module:
Base Vol: 100 1513 54 60 1023 144 33 27 53 60 74 65
Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse: 100 1513 54 60 1023 144 33 27 53 60 74 65
Added Vol: 0 0 0 0 0 0 0 0 0 0 0 0
PasserByVol: 0 0 0 0 0 0 0 0 0 0 0 0
Initial Fut: 100 1513 54 66 1023 144 33 27 53 66 74 71
User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Volume: 100 1513 54 66 1023 144 33 27 53 66 74 71
Reduced Vol: 100 1513 54 66 1023 144 33 27 53 66 74 71
PCE Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
MLF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
FinalVolume: 100 1513 54 66 1023 144 33 27 53 66 74 71

Saturation Flow Module:
Sat/Lane: 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900
Adjustment: 0.92 0.98 0.95 0.92 0.92 0.95 0.92 0.95 0.95 0.92 1.00 0.92
Lanes: 1.00 2.89 0.11 1.00 2.62 0.38 1.00 0.34 0.66 1.00 1.00 1.00
Final Sat.: 1750 5407 193 1750 4908 691 1750 607 1192 1750 1900 1750

Capacity Analysis Module:
Vol/Sat: 0.06 0.28 0.28 0.04 0.21 0.21 0.02 0.04 0.04 0.04 0.04 0.04
Crit Moves: **** **** **** ****
Green Time: 23.6 96.6 96.6 13.0 86.0 86.0 11.7 15.3 15.3 13.0 16.7 16.7
Volume/Cap: 0.36 0.43 0.43 0.36 0.36 0.36 0.24 0.43 0.43 0.43 0.35 0.36
Delay/Veh: 57.3 13.3 13.3 67.0 17.3 17.3 65.9 64.9 64.9 64.9 67.0 62.6
User DelAdj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
AdjDel/Veh: 57.3 13.3 13.3 67.0 17.3 17.3 65.9 64.9 64.9 64.9 67.0 62.6
LOS by Move: E+ B B E B B E E E E E
HCM2K95thQ: 9 21 21 5 17 17 4 8 8 7 7 7

Note: Queue reported is the number of cars per lane.
## Existing AM Level Of Service Computation Report

### 2000 HCM Operations (Future Volume Alternative)

**Intersection #9: El Camino Real & Page Mill Rd**

### Street Name: El Camino Real Page Mill Rd

**Approach:**
- North Bound
- South Bound
- East Bound
- West Bound

**Movement:**
- L - T - R
- L - T - R
- L - T - R
- L - T - R

<table>
<thead>
<tr>
<th>Min. Green</th>
<th>Y+R:</th>
</tr>
</thead>
<tbody>
<tr>
<td>7 30 0 7 30 0 7 28 28 7 30 0</td>
<td>4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0</td>
</tr>
</tbody>
</table>

**Volume Module:**
- Base Vol: 474 1275 116 333 494 262 484 884 147 259 1113 247
- Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
- Initial Bse: 474 1275 116 333 494 262 484 884 147 259 1113 247
- Added Vol: 0 0 0 0 0 0 0 0 0 0 0 0
- PasserByVol: 0 0 0 0 0 0 0 0 0 0 0 0
- Initial Fut: 474 1275 116 333 494 262 484 884 147 259 1113 247
- User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
- PHF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
- PHF Volume: 474 1275 116 333 494 262 484 884 147 259 1113 247
- Reduct Vol: 474 1275 116 333 494 262 484 884 147 259 1113 247
- PCE Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
- MLP Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
- FinalVolume: 474 1275 116 333 494 262 484 884 147 259 1113 247

### Saturation Flow Module:
- Sat/Lane: 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900
- Adjustment: 0.83 0.99 1.00 0.83 1.00 0.97 0.83 1.00 0.92 0.69 0.98 1.00
- Lanes: 2.00 2.75 0.25 2.00 3.00 1.00 2.00 2.00 1.00 2.00 1.64 0.36
- Final Sat.: 3150 5156 469 3150 5700 1847 3150 3800 1750 2625 3058 679

### Capacity Analysis Module:
- Vol/Sat: 0.15 0.25 0.25 0.11 0.09 0.14 0.15 0.23 0.08 0.10 0.36 0.36
- Crit Moves: **** **** **** **** ****
- Green Time: 18.7 34.1 34.1 14.6 30.0 30.0 19.1 45.2 45.2 19.2 45.2 45.2
- Volume/Cap: 1.01 0.91 0.91 0.91 0.36 0.36 0.59 1.01 0.64 0.23 0.64 1.01 1.01
- Delay/Veh: 96.2 53.2 53.2 82.9 40.3 47.8 95.6 35.6 28.7 57.4 65.9 65.9
- User DelAdj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
- AdjDel/Veh: 96.2 53.2 53.2 82.9 40.3 47.8 95.6 35.6 28.7 57.4 65.9 65.9
- LOS by Move: F D- D R F D D F D+ C E+ E E
- HCM2k95thQ: 26 34 35 18 10 18 27 24 8 12 54 56

**Note:** Queue reported is the number of cars per lane.
Intersection #9: El Camino Real & Page Mill Rd

Final Vol: 486***  0  886***  0  147  2
Lanes: 2 0 3 0 2

Vol Cnt Date: n/a
Cycle Time (sec): 125
Loss Time (sec): 12
Critical V/C: 0.837
Avg Crt Del (sec/veh): 72.1
Avg Delay (sec/veh): 60.7

LOS: E

User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00

Critical V/C: 0.837
Average Critical Delay (sec/veh): 72.1
Average Delay (sec/veh): 60.7

LOS: E

Final Volume:

Saturation Flow Module:

Sat/Lane: 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900
Adjustment: 0.83 0.99 1.00 0.83 1.00 0.97 0.83 1.00 0.92 0.69 0.98 1.00
Lanes: 2.00 2.75 0.25 2.00 3.00 1.00 2.00 2.00 1.00 2.00 1.64 0.36
Final Sat.: 3150 5158 467 3150 5700 1847 3150 3800 1750 2625 3059 677

Capacity Analysis Module:

Vol/Sat: 0.15 0.25 0.25 0.11 0.09 0.14 0.15 0.23 0.08 0.10 0.37 0.37
Crit Move: **** **** **** ****
Green Time: 18.6 33.9 33.9 14.7 30.0 30.0 19.1 44.9 44.9 19.5 45.2 45.2
Volume/Cap: 1.01 0.99 1.00 0.83 1.00 0.97 0.83 1.00 0.92 0.69 0.98 1.00
Delay/Veh: 96.9 54.2 48.1 40.3 47.8 96.2 35.9 28.9 57.3 66.5 66.5
User Del Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Adj Del/Veh: 96.9 54.2 48.1 40.3 47.8 96.2 35.9 28.9 57.3 66.5 66.5

LOS by Move: F D- C E+ E E

Note: Queue reported is the number of cars per lane.
Intersection #10: PAGEMILL-OREGON EXPWY/MIDDLEFIELD RD

Final Vol: 144***
Lanes: 1

Final Vol: 863
Lanes: 2

Final Vol: 157
Lanes: 1

Final Vol: 127
Lanes: 0 1 1 0 1

Vol Crnt Date: 10/19/1999
Cycle Time (sec): 180

Critical V/C: 0.717
Avg Crit Del (sec/veh): 53.6

Avg Delay (sec/veh): 49.7

Cycle Time (sec): 12

Loss Time (sec): 12

Level Of Service Computation Report
Future Volume Alternative

Approach: North Bound South Bound East Bound West Bound

Movement: L - T - R L - T - R L - T - R L - T - R

Min. Green: 10 10 10 10 10 7 10 10 7 65 10

Y+R: 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0

Volume Module: >> Count Date: 19 Oct 1999 << 7:00-9:00

Sat/Lane: 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900

Capacity Analysis Module:
Vol/Sat: 0.11 0.17 0.06 0.03 0.13 0.13 0.08 0.23 0.09 0.08 0.34 0.01

Note: Queue reported is the number of cars per lane.
Intersection #10: PAGEMILL-OREGON EXPWY/MIDDLEFIELD RD

Final Vol: 130 366*** 51
Lanes: 0 1 1 0 1

Signal=Protect/Rights=Overlap

Loss Time (sec): 12
Critical V/C: 0.724
Avg Crit Del (sec/veh): 54.1
Avg Delay (sec/veh): 49.9

Final Vol: 147*** 870 160
Lanes: 1 2 1 0 1

LOS: D

Approach:

<table>
<thead>
<tr>
<th>Movement</th>
<th>North Bound</th>
<th>South Bound</th>
<th>East Bound</th>
<th>West Bound</th>
</tr>
</thead>
<tbody>
<tr>
<td>L - T - R</td>
<td>L - T - R</td>
<td>L - T - R</td>
<td>L - T - R</td>
<td></td>
</tr>
<tr>
<td>-----------</td>
<td>-----------</td>
<td>-----------</td>
<td>-----------</td>
<td></td>
</tr>
<tr>
<td>Min. Green:</td>
<td>10 10 10 10 10 10 7 10 10 7 65 10</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Y+R:</td>
<td>4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Volume Module: >> Count Date: 19 Oct 1999 << 7:00-9:00

Base Vol: 192 324 113 51 366 127 144 863 157 135 1308 23
Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse: 192 324 113 51 366 127 144 863 157 135 1308 23
Added Vol: 3 0 0 0 0 3 3 7 3 0 7 0
PasserByVol: 0 0 0 0 0 0 0 0 0 0 0 0
Initial Fut: 195 324 113 51 366 130 147 870 160 135 1315 23
User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Volume: 195 324 113 51 366 130 147 870 160 135 1315 23
Reduct Vol: 0 0 0 0 0 0 0 0 0 0 0 0
Reduced Vol: 195 324 113 51 366 130 147 870 160 135 1315 23
PCE Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
MLF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
FinalVolume: 195 324 113 51 366 130 147 870 160 135 1315 23

Saturation Flow Module:

Sat/Lane: 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900
Adjustment: 0.92 0.92 0.92 0.92 0.92 0.92 0.92 0.92 0.92 0.92 0.92 0.92 0.92
Lanes: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Final Sat.: 1750 1750 1750 1750 2730 970 1750 3800 1750 1750 3800 1750

Capacity Analysis Module:

Vol/Sat: 0.11 0.17 0.06 0.03 0.13 0.13 0.08 0.23 0.09 0.08 0.35 0.01
Crit Moves: **** **** **** ****
Green Time: 27.7 46.1 46.1 15.0 33.3 54.2 20.9 80.0 80.0 27.0 86.1 86.1
Volume/Cap: 0.72 0.67 0.25 0.35 0.72 0.45 0.72 0.52 0.21 0.52 0.72 0.03
Delay/Veh: 81.8 63.6 53.6 79.3 72.8 51.0 88.9 36.3 30.7 72.3 39.0 24.9
User DelAdj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
AdjDel/Veh: 81.8 63.6 53.6 79.3 72.8 51.0 88.9 36.3 30.7 72.3 39.0 24.9
LOS by Move:
F 32 29 10 6 25 20 18 29 11 15 47 1

Note: Queue reported is the number of cars per lane.
## Level Of Service Computation Report

### Existing PM

**Intersection #1: Park Blvd & Sherman Ave**

<table>
<thead>
<tr>
<th>Movement</th>
<th>North Bound</th>
<th>South Bound</th>
<th>East Bound</th>
<th>West Bound</th>
</tr>
</thead>
<tbody>
<tr>
<td>L - T - R</td>
<td>L - T - R</td>
<td>L - T - R</td>
<td>L - T - R</td>
<td>L - T - R</td>
</tr>
</tbody>
</table>

### Volume Module

<table>
<thead>
<tr>
<th>Base Vol</th>
<th>Growth Adj</th>
<th>Initial Base</th>
<th>Added Vol</th>
<th>Passerby Vol</th>
<th>Initial Fut</th>
<th>User Adj</th>
<th>PHF Adj</th>
<th>PHF Volume</th>
<th>Reduct Vol</th>
<th>Final Volume</th>
</tr>
</thead>
<tbody>
<tr>
<td>26 103 4</td>
<td>1.00 1.00 1.00</td>
<td>26 103 4</td>
<td>0 0 0 0</td>
<td>0 0 0 0</td>
<td>26 103 4</td>
<td>1.00 1.00</td>
<td>1.00 1.00</td>
<td>26 103 4</td>
<td>0 0 0 0</td>
<td>26 103 4</td>
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### Critical Gap Module

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<tr>
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<th>Critical Gap</th>
<th>FollowUpTime</th>
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### Capacity Module

<table>
<thead>
<tr>
<th>Conflict Vol</th>
<th>Potential Capacity</th>
<th>Move Capacity</th>
<th>Volume/Capacity</th>
</tr>
</thead>
</table>

### Level Of Service Module

<table>
<thead>
<tr>
<th>2Way95thQ</th>
<th>Control Del</th>
<th>LOS by Move</th>
<th>Movement</th>
<th>Shared Capacity</th>
<th>Shared Queue</th>
<th>Shrd ConDel</th>
<th>Shared LOS</th>
<th>Approach Del</th>
<th>Approach LOS</th>
</tr>
</thead>
</table>

---

**Note:** Queue reported is the number of cars per lane.

---

**Future Volume Alternative: Peak Hour Warrant NOT Met**
Approach: | North Bound | South Bound | East Bound | West Bound |
Movement: L - T - R | L - T - R | L - T - R | L - T - R |
Control: Uncontrolled | Uncontrolled | Stop Sign | Stop Sign |
Lanes: 0 0 1! 0 0 | 0 0 1! 0 0 | 0 0 1! 0 0 | 0 0 1! 0 0 |
Initial Vol: 26 103 | 4 4 256 | 6 | 14 |
ApproachDel: xxxxxx | xxxxxx | 10.8 | 12.2 |

Approach[eastbound][lanes=1][control=Stop Sign]  
Signal Warrant Rule #1: [vehicle-hours=0.3]  
FAIL - Vehicle-hours less than 4 for one lane approach.

Signal Warrant Rule #2: [approach volume=115]  
FAIL - Approach volume less than 100 for one lane approach.

Signal Warrant Rule #3: [approach count=4][total volume=520]  
FAIL - Total volume less than 650 for intersection with less than four approaches.

SIGNAL WARRANT DISCLAIMER
This peak hour signal warrant analysis should be considered solely as an "indicator" of the likelihood of an unsignalized intersection warranting a traffic signal in the future. Intersections that exceed this warrant are probably more likely to meet one or more of the other volume based signal warrant (such as the 4-hour or 8-hour warrants).

The peak hour warrant analysis in this report is not intended to replace a rigorous and complete traffic signal warrant analysis by the responsible jurisdiction. Consideration of the other signal warrants, which is beyond the scope of this software, may yield different results.

Future Volume Alternative: Peak Hour Warrant NOT Met

Approach: | North Bound | South Bound | East Bound | West Bound |
Movement: L - T - R | L - T - R | L - T - R | L - T - R |
Control: Uncontrolled | Uncontrolled | Stop Sign | Stop Sign |
Lanes: 0 0 1! 0 0 | 0 0 1! 0 0 | 0 0 1! 0 0 | 0 0 1! 0 0 |
Initial Vol: 26 103 | 4 4 256 | 6 | 14 |
Major Street Volume: 399
Minor Approach Volume: 115
Minor Approach Volume Threshold: 464

SIGNAL WARRANT DISCLAIMER
This peak hour signal warrant analysis should be considered solely as an "indicator" of the likelihood of an unsignalized intersection warranting a traffic signal in the future. Intersections that exceed this warrant are probably more likely to meet one or more of the other volume based signal warrant (such as the 4-hour or 8-hour warrants).

The peak hour warrant analysis in this report is not intended to replace a rigorous and complete traffic signal warrant analysis by the responsible jurisdiction. Consideration of the other signal warrants, which is beyond the scope of this software, may yield different results.
Intersection #1: Park Blvd & Sherman Ave

**Level Of Service Computation Report**

**2000 HCM Unsignalized (Future Volume Alternative)**

**Existing+PM**

**Intersection #1: Park Blvd & Sherman Ave**

**Signal=Uncontrol/Rights=Include**

**Final Vol:**

- **Park Blvd:**
  - 23
  - 256
  - 4

- **Sherman Ave:**
  - 0
  - 0
  - 1

**Cycle Time (sec):** 100

**Loss Time (sec):** 0

**Critical V/C:** 0.17

**Avg Crit Del (sec/veh):** 4.0

**Avg Delay (sec/veh):** 4.0

**LOS:** B

**Street Name:**
- Park Blvd
- Sherman Ave

**Approach:**
- North Bound
- South Bound
- East Bound
- West Bound

**Movement:**
- L - T - R

**Volume Module:**

- **Base Vol:**
  - 26
  - 103
  - 0
  - 4
  - 256
  - 6
  - 4

- **Growth Adj:** 1.00

- **Initial Base:**
  - 26
  - 103
  - 0
  - 4
  - 256
  - 6
  - 4

- **Add Vol:**
  - 19
  - 0
  - 0
  - 0
  - 0
  - 17
  - 18

- **PasserByVol:**
  - 0
  - 0
  - 0
  - 0
  - 0

- **Initial Fut:**
  - 45
  - 103
  - 4
  - 256
  - 23
  - 32
  - 2

- **User Adj:** 1.00

- **Initial Vol:**
  - 45
  - 103
  - 4
  - 256
  - 23
  - 32
  - 2

- **PHF Adj:**
  - 1.00

- **PHF Volume:**
  - 45
  - 103
  - 4
  - 256
  - 23
  - 32
  - 2

- **Final Vol:**
  - 45
  - 103
  - 4
  - 256
  - 23
  - 32
  - 2

**Critical Gap Module:**

- **Critical Gp:**
  - 4.1
  - xxxx
  - xxxxx
  - 4.1
  - xxxx
  - xxxxx

- **FollowUpTim:**
  - 2.2
  - xxxx
  - xxxxx
  - 3.5
  - 4.0
  - 3.3
  - 4.0

**Capacity Module:**

- **Conflict Vol:**
  - 279
  - xxxx
  - xxxxx
  - 107
  - xxxx
  - xxxxx

- **Potent Cap.:**
  - 1295
  - xxxx
  - xxxxx
  - 1497
  - xxxx
  - xxxxx

- **Move Cap.:**
  - 1295
  - xxxx
  - xxxxx
  - 1497
  - xxxx
  - xxxxx

- **Volume/Cap:**
  - 0.03
  - xxxx
  - xxxxx
  - 0.00
  - xxxx
  - xxxxx

- **Shared Cap.:**
  - 0.9
  - xxxx
  - xxxxx
  - 0.0
  - xxxx
  - xxxxx

- **Shared Queue:**
  - 11.8
  - xxxx
  - xxxxx
  - 13.2
  - xxxx
  - xxxxx

- **Shared LOS:**
  - *
  - *
  - *
  - *
  - *
  - *

- **Approach Del:**
  - 11.8
  - 13.2

- **Approach LOS:**
  - *
  - B

**Note:** Queue reported is the number of cars per lane.

Peak Hour Delay Signal Warrant Report

Intersection #1 Park Blvd & Sherman Ave

Future Volume Alternative: Peak Hour Warrant NOT Met
Approach: | North Bound | South Bound | East Bound | West Bound
---|---|---|---|---
Movement: | L - T - R | L - T - R | L - T - R | L - T - R
---|---|---|---|---
Control: | Uncontrolled | Uncontrolled | Stop Sign | Stop Sign
Lanes: | 0 0 1! 0 0 | 0 0 1! 0 0 | 0 0 1! 0 0 | 0 0 1! 0 0
Initial Vol: | 45 103 4 | 4 256 23 | 32 2 132 3 2 1
Approach Vol: | xxxxxx | xxxxxx | 11.8 | 13.2

Approach [eastbound] [lanes=1] [control=Stop Sign]

Signal Warrant Rule #1: [vehicle-hours=0.5]
FAIL - Vehicle-hours less than 4 for one lane approach.

Signal Warrant Rule #2: [approach volume=166]
SUCCEED - Approach volume greater than or equal to 100 for one lane approach.

Signal Warrant Rule #3: [approach count=4] [total volume=607]
FAIL - Total volume less than 650 for intersection with less than four approaches.

Approach [westbound] [lanes=1] [control=Stop Sign]

Signal Warrant Rule #1: [vehicle-hours=0.0]
FAIL - Vehicle-hours less than 4 for one lane approach.

Signal Warrant Rule #2: [approach volume=6]
FAIL - Approach volume less than 100 for one lane approach.

Signal Warrant Rule #3: [approach count=4] [total volume=607]
FAIL - Total volume less than 650 for intersection with less than four approaches.

SIGNAL WARRANT DISCLAIMER
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Intersection #1 Park Blvd & Sherman Ave

Future Volume Alternative: Peak Hour Warrant NOT Met

Approach: | North Bound | South Bound | East Bound | West Bound
---|---|---|---|---
Movement: | L - T - R | L - T - R | L - T - R | L - T - R
---|---|---|---|---
Control: | Uncontrolled | Uncontrolled | Stop Sign | Stop Sign
Lanes: | 0 0 1! 0 0 | 0 0 1! 0 0 | 0 0 1! 0 0 | 0 0 1! 0 0
Initial Vol: | 45 103 4 | 4 256 23 | 32 2 132 3 2 1
Major Street Volume: | 435
Minor Approach Volume: | 166
Minor Approach Volume Threshold: | 441

SIGNAL WARRANT DISCLAIMER
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Intersection #2: Park Blvd & Page Mill Rd

Street Name: Park Blvd
Approach: North Bound
Movement: L - T - R

Volume Module:
Base Vol: 104 120 0 0 214 372 32 3 21 5 4 5
Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse: 104 120 0 0 214 372 32 3 21 5 4 5
Added Vol: 0 0 0 0 0 0 0 0 0 0 0 0
PasserByVol: 0 0 0 0 0 0 0 0 0 0 0 0
Initial Fut: 104 120 0 0 214 372 32 3 21 5 4 5
User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Volume: 104 120 0 0 214 372 32 3 21 5 4 5
Reduct Vol: 0 0 0 0 0 0 0 0 0 0 0 0
FinalVolume: 104 120 0 0 214 372 32 3 21 5 4 5

Capacity Module:
Conflict Vol: 586 632 0 0 214 372 32 3 21 5 4 5
Potent Cap.: 999 1052 0 0 214 372 32 3 21 5 4 5
Move Cap.: 999 1052 0 0 214 372 32 3 21 5 4 5
Volume/Cap: 0.10 0.13 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00

Level Of Service Module:
2Way95thQ: 0.3 0.3 0.3 0.3 0.1 0.1
Control Del: 9.0 9.0 9.0 9.0 11.3 11.3
LOS by Move: A * * * * * B * * C * *
Movement: LT - LTR - RT LT - LTR - RT LT - LTR - RT LT - LTR - RT
Shared Cap.: 999 999 999 999 999 999 999 999 999 999 999 999
SharedQueue: 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3
Shrd ConDel: 9.0 9.0 9.0 9.0 9.0 9.0 9.0 9.0
Shared LOS: A * * A * * B * B
ApproachDel: 12.7 12.7 12.7 12.7
ApproachLOS: B C

Note: Queue reported is the number of cars per lane.

Peak Hour Delay Signal Warrant Report

Future Volume Alternative: Peak Hour Warrant NOT Met
Approach [eastbound][lanes=2][control=Stop Sign]

Signal Warrant Rule #1: [vehicle-hours=0.2]
FAIL - Vehicle-hours less than 5 for two or more lane approach.

Signal Warrant Rule #2: [approach volume=56]
FAIL - Approach volume less than 150 for two or more lane approach.

Signal Warrant Rule #3: [approach count=4][total volume=880]
SUCCEED - Total volume greater than or equal to 800 for intersection with four or more approaches.

Approach [westbound][lanes=2][control=Stop Sign]

Signal Warrant Rule #1: [vehicle-hours=0.1]
FAIL - Vehicle-hours less than 5 for two or more lane approach.

Signal Warrant Rule #2: [approach volume=14]
FAIL - Approach volume less than 150 for two or more lane approach.

Signal Warrant Rule #3: [approach count=4][total volume=880]
SUCCEED - Total volume greater than or equal to 800 for intersection with four or more approaches.

SIGNAL WARRANT DISCLAIMER
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Intersection #2: Park Blvd & Page Mill Rd

Street Name: Park Blvd  Page Mill Rd

Approach: North Bound  South Bound  East Bound  West Bound

Movement:  L - T - R  L - T - R  L - T - R  L - T - R

Volume Module:
Base Vol:  104 120  0  0  214 372  32  3  21 5 4 5
Growth Adj:  1.00 1.00  1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse:  104 120  0  0  214 372  32  3  21 5 4 5
Added Vol:  0 0  0  0  0  18  2  0  0  0  0
PasserByVol:  0 0  0  0  0  0  0  0  0  0  0

Initial Fut:  104 120  0  0  214 390  34  3  21 5 4 5
User Adj:  1.00 1.00  1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj:  1.00 1.00  1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Volume:  104 120  0  0  214 390  34  3  21 5 4 5
Reduct Vol:  0 0  0  0  0  0  0  0  0  0  0  0
Final Volume:  104 120  0  0  214 390  34  3  21 5 4 5

Critical Gap Module:
Critical Gp:  4.1 xxxxx xxxxxx xxxxxx xxxxxx  7.1 6.5 6.2 7.1 6.5 6.2
FollowUpTim:  2.2 xxxxx xxxxxx xxxxxx xxxxxx  3.5 4.0 3.3 3.5 4.0 3.3

Capacity Module:
Cnflict Vol:  604 xxxxx xxxxxx xxxxxx xxxxxx  547 542 214 749 932 120
Potent Cap.:  984 xxxxx xxxxxx xxxxxx xxxxxx  451 450 831 331 269 937
Move Cap.:  984 xxxxx xxxxxx xxxxxx xxxxxx  405 400 831 293 238 937
Volume/Cap:  0.11 xxxxx xxxxxx xxxxxx xxxxxx  0.08 0.01 0.03 0.02 0.02 0.01

Level Of Service Module:
2Way95thQ:  0.4 xxxxx xxxxxx xxxxxx xxxxxx  0.3 xxxxx xxxxxx  0.1 xxxxx xxxxxx
Control Del:  9.1 xxxxx xxxxxx xxxxxx xxxxxx  14.7 xxxxx xxxxxx  17.5 xxxxx xxxxxx
LOS by Move:  A * * * * * B * * C * *
Movement:  LT - LTR - RT LT - LTR - RT LT - LTR - RT LT - LTR - RT
Shared Cap.:  xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx 732 xxxxx xxxxx 407
SharedQueue:  0.4 xxxxx xxxxx 0.0 xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx 0.1 xxxxx xxxxx 0.1
Shrd ConDel:  9.1 xxxxx xxxxx xxxxx xxxxx xxxxx 10.1 xxxxx xxxxx 14.0
Shared LOS:  A * * A * * * * * B * * B
ApproachDel:  xxxxxx  xxxxxx 12.8 15.3
ApproachLOS:  * B C

Note: Queue reported is the number of cars per lane.

Peak Hour Delay Signal Warrant Report

Intersection #2 Park Blvd & Page Mill Rd

Future Volume Alternative: Peak Hour Warrant NOT Met
### Traffic Analysis

<table>
<thead>
<tr>
<th>Approach:</th>
<th>North Bound</th>
<th>South Bound</th>
<th>East Bound</th>
<th>West Bound</th>
</tr>
</thead>
<tbody>
<tr>
<td>Movement:</td>
<td>L - T - R</td>
<td>L - T - R</td>
<td>L - T - R</td>
<td>L - T - R</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Control:</th>
<th>Uncontrolled</th>
<th>Uncontrolled</th>
<th>Stop Sign</th>
<th>Stop Sign</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lanes:</td>
<td>0 1 0 0 0 0</td>
<td>1 0 0 1 1 0</td>
<td>1 0 0 1 0</td>
<td>0 1 0 0 1 0</td>
</tr>
<tr>
<td>Initial Vol:</td>
<td>104 120 0</td>
<td>0 214 390 34 3 21</td>
<td>5 4 5</td>
<td>104 120 0</td>
</tr>
<tr>
<td>Approach Del:</td>
<td>xxxxxx</td>
<td>xxxxxx</td>
<td>12.8</td>
<td>15.3</td>
</tr>
</tbody>
</table>

**Approach [eastbound] [lanes=2] [control=Stop Sign]**

- **Signal Warrant Rule #1:** [vehicle-hours=0.2]
  - FAIL - Vehicle-hours less than 5 for two or more lane approach.
- **Signal Warrant Rule #2:** [approach volume=58]
  - FAIL - Approach volume less than 150 for two or more lane approach.
- **Signal Warrant Rule #3:** [approach count=4] [total volume=900]
  - SUCCEED - Total volume greater than or equal to 800 for intersection with four or more approaches.

**Approach [westbound] [lanes=2] [control=Stop Sign]**

- **Signal Warrant Rule #1:** [vehicle-hours=0.1]
  - FAIL - Vehicle-hours less than 5 for two or more lane approach.
- **Signal Warrant Rule #2:** [approach volume=14]
  - FAIL - Approach volume less than 150 for two or more lane approach.
- **Signal Warrant Rule #3:** [approach count=4] [total volume=900]
  - SUCCEED - Total volume greater than or equal to 800 for intersection with four or more approaches.

---

**SIGNAL WARRANT DISCLAIMER**

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---

**Future Volume Analysis**

<table>
<thead>
<tr>
<th>Approach:</th>
<th>North Bound</th>
<th>South Bound</th>
<th>East Bound</th>
<th>West Bound</th>
</tr>
</thead>
<tbody>
<tr>
<td>Movement:</td>
<td>L - T - R</td>
<td>L - T - R</td>
<td>L - T - R</td>
<td>L - T - R</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Control:</th>
<th>Uncontrolled</th>
<th>Uncontrolled</th>
<th>Stop Sign</th>
<th>Stop Sign</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lanes:</td>
<td>0 1 0 0 0 0</td>
<td>0 1 0 0 1 1</td>
<td>1 0 0 1 0</td>
<td>1 0 0 1 0</td>
</tr>
<tr>
<td>Initial Vol:</td>
<td>104 120 0</td>
<td>0 214 390 34 3 21</td>
<td>5 4 5</td>
<td>104 120 0</td>
</tr>
</tbody>
</table>

**Major Street Volume:** 828
**Minor Approach Volume:** 58
**Minor Approach Volume Threshold:** 455

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**SIGNAL WARRANT DISCLAIMER**

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Intersection #3: Birch St & Sherman Ave

Street Name: Birch St                        Sherman Ave
Approach: North Bound      South Bound       East Bound       West Bound
Movement: L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
----------|---------------||---------------||---------------||---------------|
Min. Green: 7 10  10  7 10  10  7 10  10
----------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol: 53 182    28    37   54    9 13 81  16  12 29 10
Growth Adj: 1.00 1.00  1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse: 53 182    28    37   54    9 13 81  16  12 29 10
Added Vol: 0 0 0     0 0 0 0 0 0 0 0 0 0
PasserByVol: 0 0 0     0 0 0 0 0 0 0 0 0 0
Initial Fut: 53 182    28    37   54    9 13 81  16  12 29 10
User Adj: 1.00 1.00  1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj: 1.00 1.00  1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Volume: 53 182    28    37   54    9 13 81  16  12 29 10
Reducut Vol: 0 0 0     0 0 0 0 0 0 0 0 0 0
Reduced Vol: 53 182    28    37   54    9 13 81  16  12 29 10
PCE Adj: 1.00 1.00  1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
MLF Adj: 1.00 1.00  1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
FinalVolume: 53 182    28    37   54    9 13 81  16  12 29 10
----------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Adjustment: 1.00 1.00  1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Lanes: 0.40 1.39 0.21 0.74 1.08 0.18 0.12 0.74 0.14 0.23 0.57 0.20
Final Sat.: 274 978 155 470 736 125 85 530 105 166 400 138
----------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat: 0.19 0.19  0.18 0.08 0.07 0.07 0.15 0.15 0.15 0.07 0.07 0.07
Crit Moves: ****  ****  ****  ****  ****  ****  ****  ****  ****  ****  ****  ****
Delay/Veh: 9.1 8.8  8.6 8.6 8.2 8.1 8.5 8.5 8.5 8.2 8.2 8.2
Delay Adj: 1.00 1.00  1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
AdjDelay/Veh: 9.1 8.8  8.6 8.6 8.2 8.1 8.5 8.5 8.5 8.2 8.2 8.2
LOS by Move: A A A    A A A A A A A A A
ApproachDelay: 8.8 8.4  8.5 8.2
Delay Adj: 1.00 1.00  1.00 1.00
ApprAdjDelay: 8.8 8.4  8.5 8.2
LOS by Appr: A A A    A A
AllWayAvgQ: 0.2 0.2  0.1 0.1 0.1 0.2 0.2 0.2 0.1 0.1 0.1
Note: Queue reported is the number of cars per lane.

Peak Hour Volume Signal Warrant Report [Urban]
**Future Volume Alternative: Peak Hour Warrant NOT Met**

<table>
<thead>
<tr>
<th>Approach:</th>
<th>North Bound</th>
<th>South Bound</th>
<th>East Bound</th>
<th>West Bound</th>
</tr>
</thead>
<tbody>
<tr>
<td>Movement:</td>
<td>L - T - R</td>
<td>L - T - R</td>
<td>L - T - R</td>
<td>L - T - R</td>
</tr>
<tr>
<td>Control:</td>
<td>Stop Sign</td>
<td>Stop Sign</td>
<td>Stop Sign</td>
<td>Stop Sign</td>
</tr>
<tr>
<td>Lanes:</td>
<td>0 1 0 1 0</td>
<td>0 1 0 1 0</td>
<td>0 0 1! 0 0</td>
<td>0 0 1! 0 0</td>
</tr>
<tr>
<td>Initial Vol:</td>
<td>53 182 28</td>
<td>37 54 9 13</td>
<td>81 16 12 29</td>
<td>10 10 10</td>
</tr>
</tbody>
</table>

**Major Street Volume:** 363

**Minor Approach Volume:** 110

**Minor Approach Volume Threshold:** 634

**SIGNAL WARRANT DISCLAIMER**

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Intersection #3: Birch St & Sherman Ave

Street Name: Birch St                        Sherman Ave

Approach: North Bound      South Bound       East Bound       West Bound
Movement: L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R

Min. Green: 7 10 10 7 10 10 7 10 10

Volume Module:
Base Vol: 53 182 28 37 54 9 13 81 16 12 29 10
Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse: 53 182 28 37 54 9 13 81 16 12 29 10
Added Vol: 0 6 20 17 10 17 21 43 9 7 35 8
PasserByVol: 0 0 0 0 0 0 0 0 0 0 0 0
Initial Fut: 53 188 48 54 64 26 34 124 25 19 64 18
User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Volume: 53 188 48 54 64 26 34 124 25 19 64 18
Reduced Vol: 53 188 48 54 64 26 34 124 25 19 64 18
PCE Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
MLF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
FinalVolume: 53 188 48 54 64 26 34 124 25 19 64 18

Saturation Flow Module:
Adjustment: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Lanes: 229 846 224 436 559 234 126 458 92 123 414 117

Capacity Analysis Module:
Vol/Sat: 0.50 0.29 0.21 0.12 0.11 0.11 0.03 0.03 0.27 0.15 0.15 0.15
Crit Moves: **** **** **** ****
Delay/Veh: 9.9 9.5 9.2 9.4 8.8 8.6 9.8 9.8 9.8 9.8 9.0 9.0
Delay Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
AdjDel/Veh: 9.9 9.5 9.2 9.4 8.8 8.6 9.8 9.8 9.8 9.8 9.0 9.0
LOS by Move: A A A A A A A A A A A A
ApproachDel: 9.5 9.0 9.8 9.0
Delay Adj: 1.00 1.00 1.00
AppraAdjDel: 9.5 9.0 9.8 9.0
LOS by Appr: A A A A
AllWayAvgQ: 0.3 0.2 0.2 0.1 0.1 0.3 0.3 0.2 0.2 0.2
Note: Queue reported is the number of cars per lane.
Future Volume Alternative: Peak Hour Warrant NOT Met

<table>
<thead>
<tr>
<th>Approach:</th>
<th>North Bound</th>
<th>South Bound</th>
<th>East Bound</th>
<th>West Bound</th>
</tr>
</thead>
<tbody>
<tr>
<td>Movement:</td>
<td>L - T - R</td>
<td>L - T - R</td>
<td>L - T - R</td>
<td>L - T - R</td>
</tr>
<tr>
<td>Control:</td>
<td>Stop Sign</td>
<td>Stop Sign</td>
<td>Stop Sign</td>
<td>Stop Sign</td>
</tr>
<tr>
<td>Lanes:</td>
<td>0 1 0 1 0</td>
<td>0 1 0 1 0</td>
<td>0 0 1 ! 0 0</td>
<td>0 0 1 ! 0 0</td>
</tr>
<tr>
<td>Initial Vol.</td>
<td>53 188 48</td>
<td>54 64 26</td>
<td>34 124 25</td>
<td>19 64 18</td>
</tr>
</tbody>
</table>

Major Street Volume: 433
Minor Approach Volume: 183
Minor Approach Volume Threshold: 573

SIGNAL WARRANT DISCLAIMER
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Intersection #4: Birch St & Grant Ave

Street Name: Birch St & Grant Ave

Approach: North Bound | South Bound | East Bound | West Bound
Movement: L - T - R | L - T - R | L - T - R | L - T - R

Volume Module:
Base Vol: 13 277 21 8 66 15 22 33 10 0 0 0
Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse: 13 277 21 8 66 15 22 33 10 0 0 0
Added Vol: 0 0 0 0 0 0 0 0 0 0 0 0
PasserByVol: 0 0 0 0 0 0 0 0 0 0 0 0
Initial Fut: 13 277 21 8 66 15 22 33 10 0 0 0
User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Volume: 13 277 21 8 66 15 22 33 10 0 0 0
Reduct Vol: 0 0 0 0 0 0 0 0 0 0 0 0
FinalVolume: 13 277 21 8 66 15 22 33 10 0 0 0

Critical Gap Module:
Critical Gp: 4.1 xxxx xxxxx 4.1 xxxx xxxxx 6.8 6.5 6.9 xxxx xxxx xxxxx
FollowUpTim: 2.2 xxxx xxxxx 2.2 xxxx xxxxx 3.5 4.0 3.3 xxxx xxxx xxxxx

Capacity Module:
Cnflict Vol: 81 xxxx xxxxx 298 xxxx xxxxx 254 414 41 xxxx xxxx xxxxx
Potent Cap.: 1529 xxxx xxxx 1275 xxxx xxxx 718 532 1028 xxxx xxxx xxxxx
Move Cap.: 1529 xxxx xxxx 1275 xxxx xxxx 710 524 1028 xxxx xxxx xxxxx
Volume/Cap: 0.01 xxxx  xxxx 0.01 xxxx  xxxx 0.03 0.06 0.01 xxxx xxxx xxxxx

Level Of Service Module:
2Way95thQ: 0.0 xxxx xxxx 0.0 xxxx xxxx xxxx xxxx xxxx xxxx xxxx xxxx
Control Del: 7.4 xxxx xxxx 7.8 xxxx xxxx xxxx xxxx xxxx xxxx xxxx xxxx
LOS by Move: A * A * A * A * * * * * *
Movement: LT - LTR - RT LT - LTR - RT LT - LTR - RT LT - LTR - RT
Shared Cap.: xxxx xxxx xxxx xxxx xxxx xxxx xxxx xxxx 627 xxxx xxxx xxxx xxxx
SharedQueue: 0.0 xxxx xxxx 0.0 xxxx xxxx xxxx xxxx xxxx 0.3 xxxx xxxx xxxx xxxx
Shrd ConDel: 7.4 xxxx xxxx 7.8 xxxx xxxx xxxx 11.4 xxxx xxxx xxxx xxxx
Shared LOS: A * A * A * A * * * B * * *
ApproachDel: xxxxxx 11.4 xxxxxx
ApproachLOS: 0 0 0 0 0 0 0 0 0 0 0 0

Note: Queue reported is the number of cars per lane.

Peak Hour Delay Signal Warrant Report

Intersection #4 Birch St & Grant Ave

Future Volume Alternative: Peak Hour Warrant NOT Met
Approach: North Bound | South Bound | East Bound | West Bound
Movement: L - T - R | L - T - R | L - T - R | L - T - R

Control: Uncontrolled | Uncontrolled | Stop Sign | Stop Sign
Lanes: 0 1 0 1 0 | 0 1 0 1 0 | 0 0 1 0 0 | 0 0 0 0 0
Initial Vol: 13 277 21 8 66 15 22 33 10 0 0 0
ApproachDel: xxxxxxx

Signal Warrant Rule #1: [vehicle-hours=0.2]
FAIL - Vehicle-hours less than 4 for one lane approach.

Signal Warrant Rule #2: [approach volume=65]
FAIL - Approach volume less than 100 for one lane approach.

Signal Warrant Rule #3: [approach count=3][total volume=465]
FAIL - Total volume less than 650 for intersection with less than four approaches.

SIGNAL WARRANT DISCLAIMER
This peak hour signal warrant analysis should be considered solely as an "indicator" of the likelihood of an unsignalized intersection warranting a traffic signal in the future. Intersections that exceed this warrant are probably more likely to meet one or more of the other volume based signal warrant (such as the 4-hour or 8-hour warrants).

The peak hour warrant analysis in this report is not intended to replace a rigorous and complete traffic signal warrant analysis by the responsible jurisdiction. Consideration of the other signal warrants, which is beyond the scope of this software, may yield different results.

Intersection #4 Birch St & Grant Ave

Future Volume Alternative: Peak Hour Warrant NOT Met

Approach: North Bound | South Bound | East Bound | West Bound
Movement: L - T - R | L - T - R | L - T - R | L - T - R

Control: Uncontrolled | Uncontrolled | Stop Sign | Stop Sign
Lanes: 0 1 0 1 0 | 0 1 0 1 0 | 0 0 1 0 0 | 0 0 0 0 0
Initial Vol: 13 277 21 8 66 15 22 33 10 0 0 0

Major Street Volume: 400
Minor Approach Volume: 65
Minor Approach Volume Threshold: 601

SIGNAL WARRANT DISCLAIMER
This peak hour signal warrant analysis should be considered solely as an "indicator" of the likelihood of an unsignalized intersection warranting a traffic signal in the future. Intersections that exceed this warrant are probably more likely to meet one or more of the other volume based signal warrant (such as the 4-hour or 8-hour warrants).

The peak hour warrant analysis in this report is not intended to replace a rigorous and complete traffic signal warrant analysis by the responsible jurisdiction. Consideration of the other signal warrants, which is beyond the scope of this software, may yield different results.
Intersection #4: Birch St & Grant Ave

Street Name: Birch St
Approach: North Bound
Movement: L - T - R
Volume Module:
Base Vol: 13 277 21 8 66 15
Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse: 13 277 21 8 66 15
Added Vol: 0 26 0 2 14 0
PasserByVol: 0 0 0 0 0 0
Initial Fut: 13 303 21 10 80 15
User Adj: 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj: 1.00 1.00 1.00 1.00 1.00 1.00
PHF Volume: 13 303 21 10 80 15
Reduct Vol: 0 0 0 0 0 0
FinalVolume: 13 303 21 10 80 15

Critical Gap Module:
Critical Gp: 4.1 xxxx xxxx 4.1 xxxx xxxx 6.8 6.5 6.9 xxxx xxxx xxxx
FollowUpTim: 2.2 xxxx xxxx 2.2 xxxx xxxx 3.5 4.0 3.3 xxxx xxxx xxxx

Capacity Module:
Cnflict Vol: 95 xxxx xxxx 324 xxxx xxxx 285 458 48 xxxx xxxx xxxx
Potent Cap.: 1512 xxxx xxxx 1247 xxxx xxxx 687 503 1018 xxxx xxxx xxxx
Move Cap.: 1512 xxxx xxxx 1247 xxxx xxxx 679 494 1018 xxxx xxxx xxxx
Volume/Cap: 0.01 xxxx xxxx 0.01 xxxx xxxx 0.03 0.07 0.01 xxxx xxxx xxxx

Level Of Service Module:
2Way95thQ: 0.0 xxxx xxxx 0.0 xxxx xxxx xxxx xxxx xxxx xxxx xxxx xxxx
Control Del: 7.4 xxxx xxxx 7.9 xxxx xxxx xxxx xxxx xxxx xxxx xxxx xxxx
LOS by Move:
Movement: LT - LTR - RT LT - LTR - RT LT - LTR - RT LT - LTR - RT
Shared Cap.: xxxx xxxx xxxx xxxx xxxx xxxx xxxx xxxx 596 xxxx xxxx xxxx xxxx
SharedQueue: 0.0 xxxx xxxx 0.0 xxxx xxxx xxxx xxxx 0.4 xxxx xxxx xxxx xxxx
Shrd ConDel: 7.4 xxxx xxxx 7.9 xxxx xxxx xxxx xxxx 11.8 xxxx xxxx xxxx xxxx
Shared LOS: A * A * A * B * *
ApproachDel: xxxxxx xxxxxx 11.8 xxxxxx
ApproachLOS: *

Note: Queue reported is the number of cars per lane.

Peak Hour Delay Signal Warrant Report

Intersection #4 Birch St & Grant Ave
Future Volume Alternative: Peak Hour Warrant NOT Met
Signal Warrant Rule #1: \(\text{vehicle-hours}=0.2\)
FAIL - Vehicle-hours less than 4 for one lane approach.

Signal Warrant Rule #2: \(\text{approach volume}=65\)
FAIL - Approach volume less than 100 for one lane approach.

Signal Warrant Rule #3: \(\text{approach count}=3\), \(\text{total volume}=507\)
FAIL - Total volume less than 650 for intersection with less than four approaches.

This peak hour signal warrant analysis should be considered solely as an "indicator" of the likelihood of an unsignalized intersection warranting a traffic signal in the future. Intersections that exceed this warrant are probably more likely to meet one or more of the other volume based signal warrant (such as the 4-hour or 8-hour warrants).

The peak hour warrant analysis in this report is not intended to replace a rigorous and complete traffic signal warrant analysis by the responsible jurisdiction. Consideration of the other signal warrants, which is beyond the scope of this software, may yield different results.

Future Volume Alternative: Peak Hour Warrant NOT Met

Signal Warrant Disclaimer
This peak hour signal warrant analysis should be considered solely as an "indicator" of the likelihood of an unsignalized intersection warranting a traffic signal in the future. Intersections that exceed this warrant are probably more likely to meet one or more of the other volume based signal warrant (such as the 4-hour or 8-hour warrants).

The peak hour warrant analysis in this report is not intended to replace a rigorous and complete traffic signal warrant analysis by the responsible jurisdiction. Consideration of the other signal warrants, which is beyond the scope of this software, may yield different results.
Intersection #5: Birch St & Sheridan Ave

Street Name: Birch St
Approach: North Bound South Bound East Bound West Bound
Movement: L - T - R L - T - R L - T - R L - T - R

Volume Module:
Base Vol: 71 280 119 24 57 6 1 29 1 67 24 7
Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse: 71 280 119 24 57 6 1 29 1 67 24 7
Added Vol: 0 0 0 0 0 0 0 0 0 0 0 0
PasserByVol: 0 0 0 0 0 0 0 0 0 0 0 0
Initial Fut: 71 280 119 24 57 6 1 29 1 67 24 7
User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Volume: 71 280 119 24 57 6 1 29 1 67 24 7
Reduct Vol: 0 0 0 0 0 0 0 0 0 0 0 0
FinalVolume: 71 280 119 24 57 6 1 29 1 67 24 7

Critical Gap Module:
Critical Gp: 4.1 xxxx xxxx xxxx 4.1 xxxx xxxx xxxx 7.1 6.5 6.2 7.1 6.5 6.2
FollowUpTim: 2.2 xxxx xxxx xxxx 2.2 xxxx xxxx xxxx 3.5 4.0 3.3 3.5 4.0 3.3

Capacity Module:
Cnflict Vol: 63 xxxx xxxx xxxx 399 xxxx xxxx xxxx 605 649 32 573 593 340
Potent Cap.: 1553 xxxx xxxx xxxx 1171 xxxx xxxx xxxx 413 391 1048 434 421 707
Move Cap.: 1553 xxxx xxxx xxxx 1171 xxxx xxxx xxxx 370 365 1048 386 393 707
Volume/Cap: 0.05 xxxx xxxx xxxx 0.02 xxxx xxxx xxxx 0.00 0.08 0.00 0.17 0.06 0.01

Level Of Service Module:
2Way95thQ: 0.1 xxxx xxxx xxxx 0.1 xxxx xxxx xxxx xxxx xxxx xxxx xxxx xxxx xxxx xxxx
Control Del: 7.4 xxxx xxxx xxxx 8.1 xxxx xxxx xxxx xxxx xxxx xxxx xxxx xxxx xxxx xxxx
LOS by Move: A * * A * * * * * * * * * * Movement: LT - LTR - RT LT - LTR - RT LT - LTR - RT LT - LTR - RT
Shared Cap.: xxxx xxxx xxxx xxxx xxxx xxxx xxxx xxxx xxxx xxxx 373 xxxx xxxx xxxx 401 xxxx
SharedQueue: 0.1 xxxx xxxx xxxx xxxx xxxx xxxx xxxx 0.3 xxxx xxxx xxxx 0.9 xxxx
Shrd ConDel: 8.1 xxxx xxxx xxxx xxxx 15.5 xxxx xxxx xxxx 16.9 xxxx
Shared LOS: C * * A * * * C * * C *
ApproachDel: xxxxxx xxxxxx 15.5 16.9
ApproachLOS: C C

Note: Queue reported is the number of cars per lane.

Peak Hour Delay Signal Warrant Report

Intersection #5 Birch St & Sheridan Ave

Future Volume Alternative: Peak Hour Warrant NOT Met
**SIGNAL WARRANT DISCLAIMER**

This peak hour signal warrant analysis should be considered solely as an "indicator" of the likelihood of an unsignalized intersection warranting a traffic signal in the future. Intersections that exceed this warrant are probably more likely to meet one or more of the other volume based signal warrant (such as the 4-hour or 8-hour warrants).

The peak hour warrant analysis in this report is not intended to replace a rigorous and complete traffic signal warrant analysis by the responsible jurisdiction. Consideration of the other signal warrants, which is beyond the scope of this software, may yield different results.

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**Intersection #5 Birch St & Sheridan Ave**

Future Volume Alternative: Peak Hour Warrant NOT Met

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**SIGNAL WARRANT DISCLAIMER**

This peak hour signal warrant analysis should be considered solely as an "indicator" of the likelihood of an unsignalized intersection warranting a traffic signal in the future. Intersections that exceed this warrant are probably more likely to meet one or more of the other volume based signal warrant (such as the 4-hour or 8-hour warrants).

The peak hour warrant analysis in this report is not intended to replace a rigorous and complete traffic signal warrant analysis by the responsible jurisdiction. Consideration of the other signal warrants, which is beyond the scope of this software, may yield different results.
Intersection #5: Birch St & Sheridan Ave

Street Name: Birch St & Sheridan Ave
Approach: North Bound South Bound East Bound West Bound
Movement: L - T - R L - T - R L - T - R L - T - R

Volume Module:
Base Vol: 71 280 119 24 57 6 1 29 1 67 24 7
Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse: 71 280 119 24 57 6 1 29 1 67 24 7
Added Vol: 0 26 0 0 14 0 0 0 0 0 0 0
PasserByVol: 0 0 0 0 0 0 0 0 0 0 0 0
Initial Fut: 71 306 119 24 71 6 1 29 1 67 24 7
User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Volume: 71 306 119 24 71 6 1 29 1 67 24 7
Reduct Vol: 0 0 0 0 0 0 0 0 0 0 0 0
FinalVolume: 71 306 119 24 71 6 1 29 1 67 24 7

Critical Gap Module:
Critical Gp: 4.1 xxxx xxxx 4.1 xxxx xxxx 7.1 6.5 6.2 7.1 6.5 6.2
FollowUpTim: 2.2 xxxx xxxx 2.2 xxxx xxxx 3.5 4.0 3.3 3.5 4.0 3.3

Capacity Module:
Cnflict Vol: 77 xxxx xxxx 425 xxxx xxxx 645 689 39 606 633 366
Potent Cap.: 1535 xxxx xxxx 1145 xxxx xxxx 388 371 1039 412 400 684
Move Cap.: 1535 xxxx xxxx 1145 xxxx xxxx 346 346 1039 366 373 684
Volume/Cap: 0.05 xxxx xxxx 0.02 xxxx xxxx 0.00 0.08 0.00 0.18 0.06 0.02

Level Of Service Module:
2Way95thQ: 0.1 xxxx xxxx 0.1 xxxx xxxx xxxx xxxx xxxx xxxx xxxx xxxx xxxx xxxx
Control Del: 7.5 xxxx xxxx 8.2 xxxx xxxx xxxx xxxx xxxx xxxx xxxx xxxx xxxx xxxx
Movement: LT - LTR - RT LT - LTR - RT LT - LTR - RT LT - LTR - RT
Shared Cap.: xxxx xxxx xxxx xxxx xxxx xxxx xxxx 353 xxxx xxxx 380 xxxx
SharedQueue: 0.1 xxxx xxxx xxxx xxxx 0.3 xxxx xxxx 1.0 xxxx
Shrd ConDel: 8.2 xxxx xxxx xxxx 16.2 xxxx xxxx 17.7 xxxx
Shared LOS: C * C * C * C * C * C * C *
ApproachDel: xxxxxx xxxxxx 16.2 17.7
ApproachLOS: C C

Note: Queue reported is the number of cars per lane.

Peak Hour Delay Signal Warrant Report

Intersection #5 Birch St & Sheridan Ave

Future Volume Alternative: Peak Hour Warrant NOT Met
### Approach: North Bound  South Bound  East Bound  West Bound
#### Movement:  L - T - R  L - T - R  L - T - R  L - T - R
#### Control:  Uncontrolled  Uncontrolled  Stop Sign  Stop Sign
#### Lanes:  0  0  1!  0  0  0  1  0  1  0  0  0  1! 0  0  0  0  1! 0  0
#### Initial Vol:  71  306  119  24  71  6  1  29  1  67  24  7
#### Approach Del:  xxxxxx

### Approach: East Bound
#### Signal Warrant Rule #1: [vehicle-hours=0.1]
   **FAIL** - Vehicle-hours less than 4 for one lane approach.
#### Signal Warrant Rule #2: [approach volume=31]
   **FAIL** - Approach volume less than 100 for one lane approach.
#### Signal Warrant Rule #3: [approach count=4][total volume=726]
   **FAIL** - Total volume less than 650 for intersection with less than four approaches.

### Approach: West Bound
#### Signal Warrant Rule #1: [vehicle-hours=0.5]
   **FAIL** - Vehicle-hours less than 4 for one lane approach.
#### Signal Warrant Rule #2: [approach volume=98]
   **FAIL** - Approach volume less than 100 for one lane approach.
#### Signal Warrant Rule #3: [approach count=4][total volume=726]
   **FAIL** - Total volume less than 650 for intersection with less than four approaches.

### SIGNAL WARRANT DISCLAIMER
This peak hour signal warrant analysis should be considered solely as an "indicator" of the likelihood of an unsignalized intersection warranting a traffic signal in the future. Intersections that exceed this warrant are probably more likely to meet one or more of the other volume based signal warrant (such as the 4-hour or 8-hour warrants).

The peak hour warrant analysis in this report is not intended to replace a rigorous and complete traffic signal warrant analysis by the responsible jurisdiction. Consideration of the other signal warrants, which is beyond the scope of this software, may yield different results.

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### Intersection #5 Birch St & Sheridan Ave

#### Future Volume Alternative: Peak Hour Warrant NOT Met

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### SIGNAL WARRANT DISCLAIMER
This peak hour signal warrant analysis should be considered solely as an "indicator" of the likelihood of an unsignalized intersection warranting a traffic signal in the future. Intersections that exceed this warrant are probably more likely to meet one or more of the other volume based signal warrant (such as the 4-hour or 8-hour warrants).

The peak hour warrant analysis in this report is not intended to replace a rigorous and complete traffic signal warrant analysis by the responsible jurisdiction. Consideration of the other signal warrants, which is beyond the scope of this software, may yield different results.
Intersection #6: Ash St & California Ave

Street Name: Ash St & California Ave

Approach: North Bound South Bound East Bound West Bound

Movement: L - T - R L - T - R L - T - R L - T - R

Min. Green: 7 10 10 7 10 10 7 10 10

Volume Module:
Base Vol: 38 0 27 0 0 0 0 147 30 28 166 0
Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse: 38 0 27 0 0 0 0 147 30 28 166 0
Added Vol: 0 0 0 0 0 0 0 0 0 0 0 0
PasserByVol: 0 0 0 0 0 0 0 0 0 0 0 0
Initial Fut: 38 0 27 0 0 0 0 147 30 28 166 0
User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Volume: 38 0 27 0 0 0 0 147 30 28 166 0
Reduct Vol: 0 0 0 0 0 0 0 0 0 0 0 0
Reduced Vol: 38 0 27 0 0 0 0 147 30 28 166 0
PCE Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
MLF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
FinalVolume: 38 0 27 0 0 0 0 147 30 28 166 0

Saturation Flow Module:
Adjustment: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Lanes: 0.58 0.00 0.42 0.00 0.00 0.00 0.00 0.00 0.00 0.14 0.86 0.00
Final Sat.: 434 0 308 0 0 0 0 743 867 117 696 0

Capacity Analysis Module:
Vol/Sat: 0.09 xxxx 0.09 xxxx xxxx xxxx xxxx 0.20 0.03 0.24 0.24 xxxx
Crit Moves: **** **** ****
Delay/Veh: 8.0 0.0 8.0 0.0 0.0 0.0 0.0 8.6 6.9 8.7 8.7 0.0
Delay Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
AdjDel/Veh: 8.0 0.0 8.0 0.0 0.0 0.0 0.0 8.6 6.9 8.7 8.7 0.0
LOS by Move: A * A * * * A A A *
ApproachDel: 8.0 xxxx xxxx 8.3 8.7
Delay Adj: 1.00 xxxx 1.00 1.00
ApprAdjDel: 8.0 xxxx xxxx 8.3 8.7

Note: Queue reported is the number of cars per lane.
Future Volume Alternative: Peak Hour Warrant NOT Met

Approach: North Bound South Bound East Bound West Bound
Movement: L - T - R L - T - R L - T - R L - T - R
Control: Stop Sign Stop Sign Stop Sign Stop Sign
Lanes: 0 0 1! 0 0 0 0 0 0 0 1 0 1 0 1 0 0 0
Initial Vol: 38 0 27 0 0 0 0 147 30 28 166 0

Major Street Volume: 371
Minor Approach Volume: 65
Minor Approach Volume Threshold: 626

SIGNAL WARRANT DISCLAIMER
This peak hour signal warrant analysis should be considered solely as an "indicator" of the likelihood of an unsignalized intersection warranting a traffic signal in the future. Intersections that exceed this warrant are probably more likely to meet one or more of the other volume based signal warrant (such as the 4-hour or 8-hour warrants).

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Intersection #6: Ash St & California Ave

**Street Name:**
- Ash St
- California Ave

**Approach:**
- North Bound
- South Bound
- East Bound
- West Bound

**Movement:**
- L - T - R
- L - T - R
- L - T - R
- L - T - R

**Min. Green:**
- North Bound: 7 10 10 7 10 10 7 10 10
- South Bound: 7 10 10 7 10 10 7 10 10
- East Bound: 7 10 10 7 10 10 7 10 10
- West Bound: 7 10 10 7 10 10 7 10 10

**Volume Module:**
- Base Vol:
  - Ash St: 38 0 27 0 0 0 0 147 30 28 166 0
  - California Ave: 38 0 27 0 0 0 0 147 30 28 166 0
- Growth Adj:
  - Ash St: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
  - California Ave: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
- Initial Bse:
  - Ash St: 38 0 27 0 0 0 0 147 30 28 166 0
  - California Ave: 38 0 27 0 0 0 0 147 30 28 166 0
- Added Vol:
  - Ash St: 9 0 0 0 0 0 0 24 0 0 33 0
  - California Ave: 9 0 0 0 0 0 0 24 0 0 33 0
- PasserByVol:
  - Ash St: 0 0 0 0 0 0 0 0 0 0 0 0
  - California Ave: 0 0 0 0 0 0 0 0 0 0 0 0
- Initial Fut:
  - Ash St: 47 0 27 0 0 0 0 171 30 28 199 0
  - California Ave: 47 0 27 0 0 0 0 171 30 28 199 0
- User Adj:
  - Ash St: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
  - California Ave: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
- PHF Adj:
  - Ash St: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
  - California Ave: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
- Reduct Vol:
  - Ash St: 0 0 0 0 0 0 0 0 0 0 0 0
  - California Ave: 0 0 0 0 0 0 0 0 0 0 0 0
- Reduced Vol:
  - Ash St: 47 0 27 0 0 0 0 171 30 28 199 0
  - California Ave: 47 0 27 0 0 0 0 171 30 28 199 0
- PCE Adj:
  - Ash St: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
  - California Ave: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
- MLF Adj:
  - Ash St: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
  - California Ave: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
- FinalVolume:
  - Ash St: 47 0 27 0 0 0 0 171 30 28 199 0
  - California Ave: 47 0 27 0 0 0 0 171 30 28 199 0

**Saturation Flow Module:**
- Adjustment: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
- Lanes: 0.64 0.00 0.36 0.00 0.00 0.00 0.00 1.00 0.12 0.88 0.00
- Final Sat.: 452 0 260 0 0 0 0 734 856 99 705 0

**Capacity Analysis Module:**
- Vol/Sat: 0.10 xxxx 0.10 xxxx xxxx xxxx xxxx 0.23 0.04 0.28 0.28 xxxx
- Crit Moves: **** **** ****
- Delay/Veh: 8.2 0.0 8.2 0.0 0.0 0.0 0.0 8.0 9.1 7.4 9.1 9.1 0.0
- Delay Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
- AdjDel/Veh: 8.2 0.0 8.2 0.0 0.0 0.0 0.0 9.0 7.4 9.1 9.1 9.1 0.0
- LOS by Move: A * A * A * A A A A
- ApproachDel: 8.2 xxxx xxxx 8.7 9.1
- Delay Adj: 1.00 xxxx 1.00 1.00
- ApprAdjDel: 8.2 xxxx 8.7 9.1
- LOS by Appr: A A A A
- AllWayAvgQ: 0.1 0.1 0.0 0.0 0.0 0.0 0.0 0.3 0.0 0.4 0.4 0.4

**Note:**
Queue reported is the number of cars per lane.

**Peak Hour Volume Signal Warrant Report [Urban]**

*** Intersection #6 Ash St & California Ave ***
**Future Volume Alternative: Peak Hour Warrant NOT Met**

<table>
<thead>
<tr>
<th>Approach:</th>
<th>North Bound</th>
<th>South Bound</th>
<th>East Bound</th>
<th>West Bound</th>
</tr>
</thead>
<tbody>
<tr>
<td>Movement:</td>
<td>L - T - R</td>
<td>L - T - R</td>
<td>L - T - R</td>
<td>L - T - R</td>
</tr>
<tr>
<td>Control:</td>
<td>Stop Sign</td>
<td>Stop Sign</td>
<td>Stop Sign</td>
<td>Stop Sign</td>
</tr>
<tr>
<td>Lanes:</td>
<td>0 0 1! 0 0 0</td>
<td>0 0 0 0 0 0</td>
<td>0 0 1 0 1</td>
<td>0 1 0 0 0</td>
</tr>
<tr>
<td>Initial Vol:</td>
<td>47 0 27 0 0</td>
<td>0 0 0 0 0 0</td>
<td>0 171 30 28 199</td>
<td>0 0</td>
</tr>
</tbody>
</table>

**Major Street Volume:** 428  
**Minor Approach Volume:** 74  
**Minor Approach Volume Threshold:** 577

**SIGNAL WARRANT DISCLAIMER**

This peak hour signal warrant analysis should be considered solely as an "indicator" of the likelihood of an unsignalized intersection warranting a traffic signal in the future. Intersections that exceed this warrant are probably more likely to meet one or more of the other volume based signal warrant (such as the 4-hour or 8-hour warrants).

The peak hour warrant analysis in this report is not intended to replace a rigorous and complete traffic signal warrant analysis by the responsible jurisdiction. Consideration of the other signal warrants, which is beyond the scope of this software, may yield different results.
### Intersection #7: ECR & Cambridge Ave

#### Final Volume

<table>
<thead>
<tr>
<th>Signal=Protect</th>
<th>Rights=Include</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Lanes:</strong></td>
<td></td>
</tr>
<tr>
<td>28</td>
<td>1</td>
</tr>
<tr>
<td>1730***</td>
<td>61</td>
</tr>
</tbody>
</table>

#### Volume Module:

- **Base Vol:** 22 1347 37 61 1730 28 86 17 26 67 37 129
- **Growth Adj:** 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
- **Initial Bse:** 22 1347 37 61 1730 28 86 17 26 67 37 129
- **Added Vol:** 0 0 0 0 0 0 0 0 0 0 0 0
- **PasserByVol:** 0 0 0 0 0 0 0 0 0 0 0 0
- **Initial Fut:** 22 1347 37 61 1730 28 86 17 26 67 37 129
- **User Adj:** 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
- **PHF Volume:** 22 1347 37 61 1730 28 86 17 26 67 37 129
- **Reduced Vol:** 0 0 0 0 0 0 0 0 0 0 0 0
- **PCE Adj:** 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
- **FinalVolume:** 22 1347 37 61 1730 28 86 17 26 67 37 129

#### Capacity Analysis Module:

- **Vol/Sat:** 0.01 0.25 0.25 0.03 0.31 0.31 0.07 0.07 0.07 0.06 0.06 0.07
- **Crit Moves:** ****
- **Green Time:** 7.0 95.1 95.1 18.0 106 106.1 24.9 24.9 24.9 24.9 24.9 24.9
- **Volume/Cap:** 0.27 0.39 0.39 0.29 0.44 0.44 0.44 0.44 0.44 0.35 0.35 0.44
- **Delay/Veh:** 70.8 13.4 13.4 61.0 9.4 9.4 57.4 57.4 57.4 57.4 57.4 57.4
- **User DelAdj:** 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
- **AdjDel/Veh:** 70.8 13.4 13.4 61.0 9.4 9.4 57.4 57.4 57.4 57.4 57.4 57.4
- **LOS by Move:** E B B E A A E+ E+ E+ E+ E+ E+
- **HCM2k95thQ:** 2 19 19 6 21 21 12 12 12 9 9 12

**Note:** Queue reported is the number of cars per lane.
Intersection #7: ECR & Cambridge Ave

Street Name: ECR Cambridge Ave

Approach: North Bound South Bound East Bound West Bound

Movement: L - T - R L - T - R L - T - R L - T - R

Min. Green: 7 10 10 7 10 10 7 10 10 7 10 10

Y+R: 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0

Volume Module:
Base Vol: 22 1347 37 61 1730 28 86 17 26 67 37 129
Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse: 22 1347 37 61 1730 28 86 17 26 67 37 129
Added Vol: 0 7 0 0 7 0 0 0 0 0 0 0
PasserByVol: 0 0 0 0 0 0 0 0 0 0 0 0
Initial Fut: 22 1354 37 61 1737 28 86 17 26 67 37 129
User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Volume: 22 1354 37 61 1737 28 86 17 26 67 37 129
Reduced Vol: 0 0 0 0 0 0 0 0 0 0 0 0
FinalVolume: 22 1354 37 61 1737 28 86 17 26 67 37 129

Saturation Flow Module:
Sat/Lane: 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900
Adjustment: 0.92 0.98 0.95 0.92 0.92 0.92 0.92 0.92 0.92 0.95 0.92 0.92
Lanes: 1.00 2.92 0.08 1.00 2.95 0.05 0.67 0.13 0.20 0.64 0.36 1.00
Final Sat.: 1750 5451 149 1750 5511 89 1167 231 353 1160 640 1750

Capacity Analysis Module:
Vol/Sat: 0.01 0.25 0.25 0.03 0.32 0.32 0.07 0.07 0.07 0.06 0.06 0.07
Crit Moves: **** ****
Green Time: 7.0 95.3 95.3 17.9 106 106.2 24.8 24.8 24.8 24.8 24.8 24.8
Volume/Cap: 0.27 0.39 0.39 0.29 0.45 0.45 0.45 0.45 0.45 0.35 0.35 0.45
Delay/Veh: 70.8 13.4 13.4 61.1 9.4 9.4 57.5 57.5 57.5 57.5 57.5 57.5
User DelAdj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
AdjDel/Veh: 70.8 13.4 13.4 61.1 9.4 9.4 57.5 57.5 57.5 57.5 57.5 57.5
LOS by Move: E B B E A A E+ E+ E+ E+ E+ E+ E+ E+ E+

Note: Queue reported is the number of cars per lane.
### Intersection #8: ECR & California Ave

#### Signal=Protect/Rights=Include

<table>
<thead>
<tr>
<th>Final Vol:</th>
<th>Lanes:</th>
<th>Vol Cnt Date:</th>
<th>Signal=Protect/Rights=Include</th>
</tr>
</thead>
<tbody>
<tr>
<td>122</td>
<td>1</td>
<td>n/a</td>
<td>1 67</td>
</tr>
<tr>
<td>0</td>
<td>1</td>
<td>150</td>
<td>0</td>
</tr>
<tr>
<td>73**</td>
<td>0</td>
<td>12</td>
<td>0</td>
</tr>
<tr>
<td>1</td>
<td>1</td>
<td>28.2</td>
<td>0</td>
</tr>
<tr>
<td>130</td>
<td>0</td>
<td>28.5</td>
<td>0</td>
</tr>
</tbody>
</table>

#### Street Name: ECR & California Ave

<table>
<thead>
<tr>
<th>Approach:</th>
<th>North Bound</th>
<th>South Bound</th>
<th>East Bound</th>
<th>West Bound</th>
</tr>
</thead>
<tbody>
<tr>
<td>Movement:</td>
<td>L - T - R</td>
<td>L - T - R</td>
<td>L - T - R</td>
<td>L - T - R</td>
</tr>
<tr>
<td>Min. Green:</td>
<td>7 10 10 10</td>
<td>7 10 10 10</td>
<td>7 10 10 10 10</td>
<td></td>
</tr>
<tr>
<td>Y+R:</td>
<td>4.0 4.0 4.0</td>
<td>4.0 4.0 4.0</td>
<td>4.0 4.0 4.0 4.0</td>
<td></td>
</tr>
</tbody>
</table>

#### Volume Module:

| Base Vol:     | 69 1241 85 | 74 1712 51 | 122 73 130 | 85 31 67 |
| Growth Adj:   | 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 |
| Initial Bse:  | 69 1241 85 | 74 1712 51 | 122 73 130 | 85 31 67 |
| Added Vol:    | 0 0 0 0 0 0 0 0 0 0 0 0 0 0 |
| PasserByVol:  | 0 0 0 0 0 0 0 0 0 0 0 0 0 0 |
| Initial Fut:  | 69 1241 85 | 74 1712 51 | 122 73 130 | 85 31 67 |
| User Adj:     | 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 |
| PHE Volume:   | 69 1241 85 | 74 1712 51 | 122 73 130 | 85 31 67 |
| Reduct Vol:   | 0 0 0 0 0 0 0 0 0 0 |
| Reduced Vol:  | 69 1241 85 | 74 1712 51 | 122 73 130 | 85 31 67 |
| PCE Adj:      | 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 |
| MLP Adj:      | 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 |
| Final Volume: | 69 1241 85 | 74 1712 51 | 122 73 130 | 85 31 67 |

#### Saturation Flow Module:

| Sat/Lane:     | 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 |
| Adjustment:   | 0.92 0.98 0.95 0.92 0.98 0.95 0.92 0.95 0.95 0.92 1.00 0.92 |
| Lanes:        | 0.1 0.2 0.0 0 0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 |
| Final Sat.:   | 1750 5241 359 1750 5438 162 1750 647 1153 1750 1900 1750 |

#### Capacity Analysis Module:

| Vol/Sat:      | 0.04 0.24 0.24 0.04 0.31 0.31 0.07 0.11 0.11 0.05 0.02 0.04 |
| Crit Moves:   | **** **** **** **** |
| Green Time:   | 10.6 79.2 79.2 15.6 84.3 84.3 22.1 30.2 30.2 13.0 21.1 21.1 |
| Volume/Cap:   | 0.56 0.45 0.45 0.41 0.56 0.56 0.47 0.56 0.56 0.56 0.12 0.27 |
| Delay/Veh:    | 73.2 22.0 22.0 64.3 21.3 21.3 60.0 55.9 55.9 70.4 56.5 58.2 |
| User DelAdj:  | 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 |
| AdjDel/Veh:   | 73.2 22.0 22.0 64.3 21.3 21.3 60.0 55.9 55.9 70.4 56.5 58.2 |
| LOS by Move:  | E C+ C+ E C+ C+ E E+ E+ E E+ E+ |
| HCM2K95thQ:  | 8 22 22 7 30 30 11 17 17 9 3 6 |

Note: Queue reported is the number of cars per lane.
Intersection #8: ECR & California Ave

Street Name: ECR                          California Ave
Approach:  North Bound       South Bound       East Bound       West Bound
Movement:  L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
-----------|---------------||---------------||---------------||---------------|
Min. Green: 7 10 10 10 | 7 10 10 10 | 7 10 10 10 | 7 10 10 10
Y+R: 4.0 4.0 4.0 4.0 | 4.0 4.0 4.0 4.0 | 4.0 4.0 4.0 4.0 | 4.0 4.0 4.0 4.0
-----------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol: 69 1241 85 | 74 1712 51 | 122 73 130 | 85 31 67
Growth Adj: 1.00 1.00 1.00 | 1.00 1.00 1.00 | 1.00 1.00 1.00 | 1.00 1.00 1.00
Initial Bse: 69 1241 85 | 74 1712 51 | 122 73 130 | 85 31 67
Added Vol: 0 0 0 | 0 0 0 | 0 0 0 | 0 0 0
PasserByVol: 0 0 0 | 0 0 0 | 0 0 0 | 0 0 0
Initial Fut: 69 1241 85 | 81 1712 51 | 122 73 130 | 93 31 74
User Adj: 1.00 1.00 1.00 | 1.00 1.00 1.00 | 1.00 1.00 1.00 | 1.00 1.00 1.00
PHF Volume: 69 1241 85 | 81 1712 51 | 122 73 130 | 93 31 74
Reduced Vol: 0 0 0 | 0 0 0 | 0 0 0 | 0 0 0
FinalVolume: 69 1241 85 | 81 1712 51 | 122 73 130 | 93 31 74
-----------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane: 1900 1900 1900 | 1900 1900 1900 | 1900 1900 1900 | 1900 1900 1900
Adjustment: 0.92 0.98 0.95 | 0.92 0.98 0.95 | 0.92 0.95 0.95 | 0.92 1.00 0.92
Lanes: 1.00 2.0 0.20 | 1.00 2.9 0.09 | 1.00 0.36 0.64 | 1.00 1.00 1.00
Final Sat.: 1750 5241 359 | 1750 5438 162 | 1750 647 1153 | 1750 1900 1750
-----------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat: 0.04 0.24 0.24 | 0.05 0.31 0.31 | 0.07 0.11 0.11 | 0.05 0.02 0.04
Crit Moves: **** | **** | **** | ****
Green Time: 10.5 78.5 78.5 | 15.5 83.5 83.5 | 22.5 29.9 29.9 | 14.1 21.5 21.5
Volume/Cap: 0.57 0.45 0.45 | 0.45 0.57 0.57 | 0.46 0.57 0.57 | 0.57 0.11 0.29
Delay/Veh: 73.6 22.4 22.4 | 65.0 21.7 21.7 | 59.6 56.3 56.3 | 69.5 56.1 58.1
User DelAdj: 1.00 1.00 1.00 | 1.00 1.00 1.00 | 1.00 1.00 1.00 | 1.00 1.00 1.00
AdjDel/Veh: 73.6 22.4 22.4 | 65.0 21.7 21.7 | 59.6 56.3 56.3 | 69.5 56.1 58.1
LOS by Move: E C+ C+ | E C+ C+ C+ | E+ E+ E+ | E+ E+ E+
HCM2k95thQ: 8 23 23 | 7 30 30 | 11 17 17 | 10 3 7
Note: Queue reported is the number of cars per lane.
### Intersection #9: El Camino Real & Page Mill Rd

<table>
<thead>
<tr>
<th>Final Vol:</th>
<th>260</th>
<th>1212</th>
<th>462***</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lanes:</td>
<td>1</td>
<td>0</td>
<td>2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Final Vol:</th>
<th>334</th>
<th>125</th>
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</thead>
<tbody>
<tr>
<td>Lanes:</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Loss Time (sec):</td>
<td>12</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Final Vol:</th>
<th>265</th>
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</thead>
<tbody>
<tr>
<td>Lanes:</td>
<td>2</td>
</tr>
<tr>
<td>Avg Delay (sec/veh):</td>
<td>47.0</td>
</tr>
</tbody>
</table>

**Street Name:** El Camino Real  
**Approach:** North Bound  
**Movement:** L - T - R  
**Base Vol:** 247  
**User Adj:** 1.00  
**MLF Adj:** 1.00  
**Final Volume:** 247

---

**Saturation Flow Module:**

| Sat/Lane: | 1900 1900 1900 1900 1900 1900 1900 1900 1900 |
|---|---|---|---|---|---|---|---|---|---|
| Adjustment: | 0.83 0.99 1.00 0.83 1.00 0.97 0.83 1.00 0.92 0.69 0.98 1.00 |
| Lanes: | 2.00 2.34 0.66 2.00 3.00 1.00 2.00 2.00 1.00 2.00 1.63 0.37 |
| Final Sat.: | 3150 4412 1254 3150 5700 1847 3150 3800 1750 2625 3032 705 |

---

**Capacity Analysis Module:**

| Vol/Sat: | 0.08 0.18 0.18 0.15 0.21 0.14 0.11 0.29 0.15 0.12 0.25 0.25 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Crit Moves: | **** | **** | **** | **** |
| Green Time: | 12.8 30.0 30.0 22.1 39.3 39.3 18.3 43.5 43.5 17.4 42.6 42.6 |
| Volume/Cap: | 0.76 0.74 0.74 0.83 0.68 0.45 0.72 0.83 0.44 0.83 0.72 0.72 |
| Delay/Veh: | 70.3 47.7 47.7 63.0 39.4 36.7 60.4 43.5 33.6 71.5 39.7 39.7 |

---

Note: Queue reported is the number of cars per lane.
Intersection #9: El Camino Real & Page Mill Rd

Final Vol: 260
Lanes: 1 0 122 3 0 2

Final Vol: 337
Lanes: 2

Final Vol: 1099
Lanes: 2

Final Vol: 265
Lanes: 1

Street Name: El Camino Real
Approach: North Bound South Bound East Bound West Bound
Movement: L - T - R L - T - R L - T - R L - T - R

Min. Green: 7 30 0 7 30 0 7 28 28 7 30 0

Y+R: 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0

Saturation Flow Module:
Sat/Lane: 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900
Adjustment: 0.83 0.99 1.00 0.83 1.00 0.97 0.83 1.00 0.92 0.69 0.98 1.00
Lanes: 2.00 2.35 0.65 2.00 3.00 1.00 2.00 2.00 1.00 2.00 1.63 0.37
Final Sat.: 3150 4423 1243 3150 5700 1847 3150 3800 1750 2625 3036 701

Capacity Analysis Module:
Vol/Sat: 0.08 0.18 0.18 0.15 0.21 0.14 0.11 0.29 0.15 0.12 0.25 0.25
Crit Moves: **** **** **** ****
Green Time: 12.9 30.0 30.0 22.2 39.4 39.4 18.3 43.0 43.0 17.7 42.5 42.5
Volume/Cap: 0.76 0.75 0.75 0.84 0.68 0.45 0.73 0.84 0.44 0.84 0.73 0.73
Delay/Veh: 70.1 47.9 47.9 63.8 39.3 36.6 60.7 44.4 34.0 72.1 39.9 39.9
User DelAdj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
AdjDel/Veh: 70.1 47.9 47.9 63.8 39.3 36.6 60.7 44.4 34.0 72.1 39.9 39.9
LOS by Move: E D D E D D+ E D C- E D D
HCM2k95thQ: 13 23 24 22 23 15 16 35 15 17 27 29

Note: Queue reported is the number of cars per lane.
Intersection #10: PAGEMILL-OREGON EXPWY/MIDDLEFIELD RD

| Final Vol: | Lanes: 106 472 45 |
| Signal=Protect |
| Rights=Overlap |
| 117*** |

- Signal=Protect |
- Rights=Include |

- Final Vol: 117*** 1 0 2
- Loss Time (sec): 12
- Critical V/C: 0.594
- Avg Crit Del (sec/veh): 53.9
- Avg Delay (sec/veh): 54.7
- LOS: D-

Approach: North Bound South Bound East Bound West Bound

<table>
<thead>
<tr>
<th>Movement:</th>
<th>L - T - R</th>
<th>L - T - R</th>
<th>L - T - R</th>
<th>L - T - R</th>
</tr>
</thead>
<tbody>
<tr>
<td>Min. Green:</td>
<td>10 10 10 10 10 10 7 10 10 7 65 10</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Y+R:</td>
<td>4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Volume Module: >> Count Date: 24 Sep 2014 << 5:15-6:15 PM

| Base Vol: | 168 366 98 45 472 106 117 1136 220 202 895 52 |
| Growth Adj: | 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 |
| Initial Bse: | 168 366 98 45 472 106 117 1136 220 202 895 52 |
| Added Vol: | 0 0 0 0 0 0 0 0 0 0 0 0 |
| PasserByVol: | 0 0 0 0 0 0 0 0 0 0 0 0 |
| Initial Fut: | 168 366 98 45 472 106 117 1136 220 202 895 52 |
| User Adj: | 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 |
| PHF Adj: | 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 |
| PHF Volume: | 168 366 98 45 472 106 117 1136 220 202 895 52 |
| Reduced Vol: | 0 0 0 0 0 0 0 0 0 0 0 0 |
| PCE Adj: | 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 |
| MLP Adj: | 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 |
| FinalVolume: | 168 366 98 45 472 106 117 1136 220 202 895 52 |

Saturation Flow Module:
Sat/Lane: | 1900 1900 1900 1900 1900 1900 1900 202 895 202 895 52 |
Adjustment: | 0.92 1.00 0.92 0.92 0.98 0.95 0.92 1.00 0.92 1.00 0.92 |
| Lanes: | 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 |
| Final Sat.: | 1750 1900 1750 1750 3021 678 1750 3800 1750 1750 3800 1750 |

Capacity Analysis Module:
Vol/Sat: | 0.10 0.19 0.06 0.03 0.16 0.16 0.07 0.30 0.13 0.12 0.24 0.03 |
Crit Moves: | **** **** **** **** |
Green Time: | 29.1 59.3 59.3 67.6 67.6 67.6 67.6 67.6 67.6 67.6 67.6 67.6 |
| Volume/Cap: | 0.59 0.58 0.17 0.59 0.59 0.42 0.59 0.81 0.34 0.81 0.59 0.07 |
| Delay/Veh: | 73.4 51.5 43.0 41.8 41.8 41.8 41.8 41.8 41.8 41.8 41.8 41.8 |
| User DelAdj: | 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 |
| AdjDel/Veh: | 73.4 51.5 43.0 41.8 41.8 41.8 41.8 41.8 41.8 41.8 41.8 41.8 |
| LOS by Move: | E D- D E- E+ D F E+ D F D C- |
| HCM2k95thQ: | 18 29 8 5 25 21 14 47 24 33 4 |
| Note: Queue reported is the number of cars per lane. |
### Intersection #10: PAGEMILL-OREGON EXPWY/MIDDLEFIELD RD

**Final Vol:**
- Lanes: 109
- Signal=Protect
- Rights=Overlap

**Vol Cnt Date:** 9/24/2014
- Signal=Protect
- Rights=Include
- Lanes: 180
- Final Vol: 1
- Loss Time (sec): 12
- Critical V/C: 0.602
- Avg Crit Del (sec/veh): 54.3
- Avg Delay (sec/veh): 54.9
- LOS: D-

**Approach:**
- North Bound
  - L - T - R
  - Min. Green: 10
  - Y+R: 4.0
- South Bound
  - L - T - R
  - Min. Green: 10
  - Y+R: 4.0
- East Bound
  - L - T - R
  - Min. Green: 10
  - Y+R: 4.0
- West Bound
  - L - T - R
  - Min. Green: 10
  - Y+R: 4.0

**Volume Module:**
- **Base Vol:** 168 366 98 45 472 106 117 1136 220 202 895 52
- **Growth Adj:** 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
- **Initial Bse:** 168 366 98 45 472 106 117 1136 220 202 895 52
- **Added Vol:** 4 0 0 0 0 0 0 0 0 0 0 0
- **PasserByVol:** 0 0 0 0 0 0 0 0 0 0 0 0
- **Initial Fut:** 172 366 98 45 472 109 120 1146 224 202 904 52
- **User Adj:** 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
- **PHF Adj:** 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
- **PHF Volume:** 172 366 98 45 472 109 120 1146 224 202 904 52
- **Reduct Vol:** 0 0 0 0 0 0 0 0 0 0 0 0
- **Reduced Vol:** 172 366 98 45 472 109 120 1146 224 202 904 52
- **PCE Adj:** 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
- **MLF Adj:** 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
- **FinalVolume:** 172 366 98 45 472 109 120 1146 224 202 904 52

**Saturation Flow Module:**
- **Sat/Lane:** 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900
- **Adjustment:** 0.92 1.00 0.92 0.92 0.98 0.95 0.92 1.00 0.92 0.92 1.00 0.92
- **Lanes:** 1.00 1.00 1.00 1.00 1.61 0.39 1.00 2.00 1.00 2.00 2.00 2.00
- **Final Sat.:** 1750 1900 1750 1750 3005 694 1750 3800 1750 1750 3800 1750

**Capacity Analysis Module:**
- **Vol/Sat:** 0.10 0.19 0.06 0.03 0.16 0.16 0.07 0.30 0.13 0.12 0.24 0.03
- **Crit Moves:** **** **** **** ****
- **Green Time:** 29.4 59.3 59.3 17.1 47.0 67.5 20.5 66.3 66.3 25.4 71.1 71.1
- **Volume/Cap:** 0.60 0.59 0.17 0.27 0.60 0.42 0.60 0.82 0.35 0.82 0.60 0.08
- **Delay/Veh:** 73.5 51.6 43.0 76.5 59.4 41.9 81.0 55.4 41.5 94.1 43.9 34.0
- **User DelAdj:** 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
- **AdjDel/Veh:** 73.5 51.6 43.0 76.5 59.4 41.9 81.0 55.4 41.5 94.1 43.9 34.0
- **LOS by Move:** E D- D E- E+ D F E+ D F D C-
- **HCM2k95thQ:** 19 29 5 26 21 14 48 17 24 33 4

*Note: Queue reported is the number of cars per lane.*
Level Of Service Computation Report
2000 HCM Unsignalized (Future Volume Alternative)
Background AM

Intersection #1: Park Blvd & Sherman Ave

Final Vol: 4 4 168 4
Lanes: 0 0 11 0 0

Signal=Uncontrol
Rights=Include

Vol Cnt Date: n/a
Cycle Time (sec): 100

Loss Time (sec): 0

Critical V/C: 0.043

Avg Crit Del (sec/veh): 2.2

Avg Delay (sec/veh): 2.2

LOS: B

Street Name: Park Blvd
Approach: North Bound
Movement: L - T - R

Volume Module:
Base Vol: 34 134 3 4 151 4
Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse: 34 134 3 4 151 4
Added Vol: 0 0 0 0 0 0 0 0 0 0 0 0
PasserByVol: 0 0 0 0 7 0 0 0 4 0 0 0
Initial Fut: 34 134 3 4 158 4

User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00

PHF Volume: 34 134 3 4 158 4
Reduct Vol: 0 0 0 0 0 0 0 0 0 0 0 0
FinalVolume: 34 134 3 4 158 4

Critical Gap Module:
Critical Gp: 4.1 xxxx xxxxx 4.1 xxxx xxxxx 7.1 6.5 6.2 7.1 6.5 6.2
FollowUpTim: 2.2 xxxx xxxxx 2.2 xxxx xxxxx 3.5 4.0 3.3 3.5 4.0 3.3

Capacity Module:
Conflict Vol: 162 xxxx xxxxx 137 xxxx xxxxx 376 373 160 391 374 136
Potent Cap.: 1429 xxxx xxxxx 1459 xxxx xxxxx 585 561 890 572 560 919
Move Cap.: 1429 xxxx xxxxx 1459 xxxx xxxxx 567 545 890 537 545 919

Volume/Cap: 0.02 xxxx xxxx 0.00 xxxx xxxx 0.01 0.00 0.04 0.01 0.00 0.01

Level Of Service Module:
2Way95thQ: 0.1 xxxx xxxx 0.0 xxxx xxxx xxxx xxxx xxxx xxxx
Control Del: 7.6 xxxx xxxx 7.5 xxxx xxxx xxxx xxxx xxxx xxxx
LOS by Move:
A * * A * * * * * * *

Movement:
LT - LTR - RT LT - LTR - RT LT - LTR - RT LT - LTR - RT

Shared Queue:
0.2 xxxx xxxx 0.1 xxxx

Shrd ConDel: 9.7 xxxx xxxx 10.3 xxxx

Shared LOS: A * * * * A * * B *

Approach Del: 9.7 10.3
Approach LOS: A B

Note: Queue reported is the number of cars per lane.

Peak Hour Delay Signal Warrant Report

Intersection #1 Park Blvd & Sherman Ave

Future Volume Alternative: Peak Hour Warrant NOT Met
<table>
<thead>
<tr>
<th>Approach:</th>
<th>North Bound</th>
<th>South Bound</th>
<th>East Bound</th>
<th>West Bound</th>
</tr>
</thead>
<tbody>
<tr>
<td>Movement:</td>
<td>L - T - R</td>
<td>L - T - R</td>
<td>L - T - R</td>
<td>L - T - R</td>
</tr>
<tr>
<td>Control:</td>
<td>Uncontrolled</td>
<td>Uncontrolled</td>
<td>Stop Sign</td>
<td>Stop Sign</td>
</tr>
<tr>
<td>Lanes:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Initial Vol:</td>
<td>34 134</td>
<td>3 158</td>
<td>4 7 0</td>
<td>3 8 6 1 8</td>
</tr>
<tr>
<td>Approach Del:</td>
<td>xxxxxxx</td>
<td></td>
<td>9.7 10.3</td>
<td></td>
</tr>
</tbody>
</table>

**Approach [eastbound] [lanes=1] [control=Stop Sign]**

- **Signal Warrant Rule #1**: [vehicle-hours=0.1]
  - FAIL - Vehicle-hours less than 4 for one lane approach.
- **Signal Warrant Rule #2**: [approach volume=45]
  - FAIL - Approach volume less than 100 for one lane approach.
- **Signal Warrant Rule #3**: [approach count=4] [total volume=397]
  - FAIL - Total volume less than 650 for intersection with less than four approaches.

**Approach [westbound] [lanes=1] [control=Stop Sign]**

- **Signal Warrant Rule #1**: [vehicle-hours=0.0]
  - FAIL - Vehicle-hours less than 4 for one lane approach.
- **Signal Warrant Rule #2**: [approach volume=15]
  - FAIL - Approach volume less than 100 for one lane approach.
- **Signal Warrant Rule #3**: [approach count=4] [total volume=397]
  - FAIL - Total volume less than 650 for intersection with less than four approaches.

**SIGNAL WARRANT DISCLAIMER**

This peak hour signal warrant analysis should be considered solely as an "indicator" of the likelihood of an unsignalized intersection warranting a traffic signal in the future. Intersections that exceed this warrant are probably more likely to meet one or more of the other volume based signal warrant (such as the 4-hour or 8-hour warrants).

The peak hour warrant analysis in this report is not intended to replace a rigorous and complete traffic signal warrant analysis by the responsible jurisdiction. Consideration of the other signal warrants, which is beyond the scope of this software, may yield different results.

---

**Intersection #1 Park Blvd & Sherman Ave**

**Future Volume Alternative: Peak Hour Warrant NOT Met**

<table>
<thead>
<tr>
<th>Approach:</th>
<th>North Bound</th>
<th>South Bound</th>
<th>East Bound</th>
<th>West Bound</th>
</tr>
</thead>
<tbody>
<tr>
<td>Movement:</td>
<td>L - T - R</td>
<td>L - T - R</td>
<td>L - T - R</td>
<td>L - T - R</td>
</tr>
<tr>
<td>Control:</td>
<td>Uncontrolled</td>
<td>Uncontrolled</td>
<td>Stop Sign</td>
<td>Stop Sign</td>
</tr>
<tr>
<td>Lanes:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Initial Vol:</td>
<td>34 134</td>
<td>3 158</td>
<td>4 7 0</td>
<td>3 8 6 1 8</td>
</tr>
<tr>
<td>Major Street Volume:</td>
<td>337</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Minor Approach Volume:</td>
<td>45</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Minor Approach Volume Threshold:</td>
<td>509</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**SIGNAL WARRANT DISCLAIMER**

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Level Of Service Computation Report
2000 HCM Unsignalized (Future Volume Alternative)
Background+Project AM

Intersection #1: Park Blvd & Sherman Ave

Final Vol: 15 158 4
Lanes: 0 1 0 0

Final Vol: 12 0 0
Lanes: 0 0

Final Vol: 55 0
Lanes: 0 0

Street Name: Park Blvd
Approach: North Bound
Movement: L - T - R

Street Name: Sherman Ave
Approach: South Bound
Movement: L - T - R

Street Name: Park Blvd
Approach: East Bound
Movement: L - T - R

Street Name: Sherman Ave
Approach: West Bound
Movement: L - T - R

Volume Module:
Base Vol: 34 134 3 4 151 4 7 0 34 6 1 8
Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse: 34 134 3 4 151 4 7 0 34 6 1 8
Added Vol: 12 0 0 0 0 11 5 0 17 0 0 0
PasserByVol: 0 0 0 0 7 0 0 0 4 0 0 0
Initial Fut: 46 134 3 4 158 15 12 0 55 6 1 8
User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Volume: 46 134 3 4 158 15 12 0 55 6 1 8
Reduct Vol: 0 0 0 0 0 0 0 0 0 0 0 0
FinalVolume: 46 134 3 4 158 15 12 0 55 6 1 8

Critical Gap Module:
Critical Gp: 4.1 xxxx xxxx 4.1 xxxx xxxx 7.1 6.5 6.2 7.1 6.5 6.2
FollowUpTim: 2.2 xxxx xxxx 2.2 xxxx xxxx 3.5 4.0 3.3 3.5 4.0 3.3

Capacity Module:
Cntflict Vol: 173 xxxx xxxx 137 xxxx xxxx 406 403 166 429 409 136
Potent Cap.: 1416 xxxx xxxx 1459 xxxx xxxx 559 540 884 540 535 919
Move Cap.: 1416 xxxx xxxx 1459 xxxx xxxx 538 520 884 493 516 919
Volume/Cap: 0.03 xxxx xxxx 0.00 xxxx xxxx 0.02 0.00 0.06 0.01 0.00 0.01

Level Of Service Module:
2Way95thQ: 0.1 xxxx xxxx 0.0 xxxx xxxx xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx
Control Del: 7.6 xxxx xxxx 7.5 xxxx xxxx xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx
LOS by Move: A * * A * * * * * * * *
Movement: LT - LTR - RT LT - LTR - RT LT - LTR - RT LT - LTR - RT
Shared Cap.: xxxx xxxx xxxx xxxx xxxx xxxx xxxx 793 xxxx xxxx 657 xxxx
SharedQueue:xxxx xxxx xxxx xxxx xxxx xxxx xxxx 0.3 xxxx xxxx 0.1 xxxx
Shrd ConDel:xxxx xxxx xxxx xxxx xxxx xxxx xxxx 10.0 xxxx xxxx 10.6 xxxx
Shared LOS: * * * * * * * * * * A * B*
ApproachDel: xxxxxx xxxxxx 10.0 10.6
ApproachLOS: * *

Note: Queue reported is the number of cars per lane.
Peak Hour Delay Signal Warrant Report

Intersection #1 Park Blvd & Sherman Ave

Future Volume Alternative: Peak Hour Warrant NOT Met
<table>
<thead>
<tr>
<th>Approach: North Bound</th>
<th>South Bound</th>
<th>East Bound</th>
<th>West Bound</th>
</tr>
</thead>
<tbody>
<tr>
<td>Movement: L - T - R</td>
<td>L - T - R</td>
<td>L - T - R</td>
<td>L - T - R</td>
</tr>
<tr>
<td>Control: Uncontrolled</td>
<td>Uncontrolled</td>
<td>Stop Sign</td>
<td>Stop Sign</td>
</tr>
<tr>
<td>Lanes: 0 0 1! 0 0 0 0 0 0 1! 0 0 0 0 0 1! 0 0 0 0 1! 0 0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Initial Vol: 46 134 4 158 15 12 0 55 6 1 8</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ApproachDel: xxxxxxx xx0xxxx 10.0 10.6</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Approach[eastbound][lanes=1][control=Stop Sign]**

- **Signal Warrant Rule #1:** [vehicle-hours=0.2]
  - FAIL - Vehicle-hours less than 4 for one lane approach.

- **Signal Warrant Rule #2:** [approach volume=67]
  - FAIL - Approach volume less than 100 for one lane approach.

- **Signal Warrant Rule #3:** [approach count=4][total volume=442]
  - FAIL - Total volume less than 650 for intersection with less than four approaches.

**Approach[westbound][lanes=1][control=Stop Sign]**

- **Signal Warrant Rule #1:** [vehicle-hours=0.0]
  - FAIL - Vehicle-hours less than 4 for one lane approach.

- **Signal Warrant Rule #2:** [approach volume=15]
  - FAIL - Approach volume less than 100 for one lane approach.

- **Signal Warrant Rule #3:** [approach count=4][total volume=442]
  - FAIL - Total volume less than 650 for intersection with less than four approaches.

**SIGNAL WARRANT DISCLAIMER**

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**Peak Hour Volume Signal Warrant Report [Urban]**

**Intersection #1 Park Blvd & Sherman Ave**

---

**Future Volume Alternative:** Peak Hour Warrant NOT Met

---

**Approach: North Bound | South Bound | East Bound | West Bound**

<table>
<thead>
<tr>
<th>Movement: L - T - R</th>
<th>L - T - R</th>
<th>L - T - R</th>
<th>L - T - R</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control: Uncontrolled</td>
<td>Uncontrolled</td>
<td>Stop Sign</td>
<td>Stop Sign</td>
</tr>
<tr>
<td>Lanes: 0 0 1! 0 0 0 0 0 1! 0 0 0 0 1! 0 0 0 0 1! 0 0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Initial Vol: 46 134 3 4 158 15 12 0 55 6 1 8</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Major Street Volume:</td>
<td>360</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Minor Approach Volume:</td>
<td>67</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Minor Approach Volume Threshold:</td>
<td>492</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**SIGNAL WARRANT DISCLAIMER**

This peak hour signal warrant analysis should be considered solely as an "indicator" of the likelihood of an unsignalized intersection warranting a traffic signal in the future. Intersections that exceed this warrant are probably more likely to meet one or more of the other volume based signal warrant (such as the 4-hour or 8-hour warrants).

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Level Of Service Computation Report
2000 HCM Operations (Future Volume Alternative)
Background AM

Intersection #2: Park Blvd & Page Mill Rd

Street Name: Park Blvd Page Mill Rd

Approach:  
North Bound  South Bound  East Bound  West Bound
Movement:  
L - T - R  L - T - R  L - T - R  L - T - R

Min. Green:  
7   10  10  7   10  10  7   10  10  7   10  10

Y+R:  
4.0  4.0  4.0  4.0  4.0  4.0  4.0  4.0  4.0  4.0  4.0  4.0

Volume Module:
Base Vol:  
153  134  7  3  221  206  65  5  51  3  4  1
Growth Adj:  
1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
Initial Bse:  
153  134  7  3  221  206  65  5  51  3  4  1
Added Vol:  
0   0   0   0   0   0   0   0   0   0   0   0
PasserByVol:  
0   2   2   15  19   8  16   16   6   0   2   2
Initial Fut:  
153  136  9  18  240  214  81  21  57  3  6  3
User Adj:  
1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00

PCE Adj:  
1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
FinalVol:  
153  136  9  18  240  214  81  21  57  3  6  3

Capacity Analysis Module:
Vol/Sat:  
0.17  0.17  0.17  0.14  0.14  0.18  0.05  0.05  0.05  0.00  0.01  0.01
Crit Moves:  
****  ****  ****  ****
Green Time:  
32.4  32.4  32.4  26.3  26.3  35.6  9.3  11.4  11.4  8.0  10.0  10.0
Volume/Cap:  
0.47  0.47  0.47  0.47  0.47  0.47  0.47  0.47  0.40  0.40  0.02  0.05  0.05
Uniform Del:  
22.2  22.2  22.2  26.2  26.2  20.0  38.0  36.2  36.2  37.5  35.8  35.8
IncremtnDel:  
0.6  0.6  0.6  0.6  0.6  0.7  2.0  1.4  1.4  0.1  0.1  0.1
InitQueuDel:  
0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0
Delay Adj:  
1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
Delay/Veh:  
22.7  22.7  22.7  26.8  26.8  20.7  40.0  37.5  37.5  37.5  35.9  35.9
User DelAdj:  
1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
AdjDel/Veh:  
22.7  22.7  22.7  26.8  26.8  20.7  40.0  37.5  37.5  37.5  35.9  35.9
LOS by Move:  
C+   C+    C+    C+    D+    D+    D+    D+    D+    D+    D+    D+
HCM2kAvgQ:  
7   7   6   6   5   3   3   3   0   0   0   0

Note: Queue reported is the number of cars per lane.
Intersection #2: Park Blvd & Page Mill Rd

**Level Of Service Computation Report**

2000 HCM Operations (Future Volume Alternative)
Background+Project AM

Street Name:            Park Blvd                        Page Mill Rd
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Min. Green:  7 10 10 10 | 7 10 10 10 | 7 10 10 10 | 7 10 10 10
Y+R:          4.0 4.0 4.0 4.0 | 4.0 4.0 4.0 4.0 | 4.0 4.0 4.0 4.0

Volume Module:

Base Vol:     153 134     7     3 221 206     65  5 51     3  4 1
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00 1.00  1.00
Initial Bse:  153 134     7     3 221 206     65  5 51     3  4 1
Added Vol:     0     0     0     0 0     0     0 0     0     0 0  0
PasserByVol: 0  2  2 15 19  8 16 16  6  0  2  2
Initial Fut:  153 136  9 18 240 228  83 21 57  3  6  3
User Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00 1.00  1.00
PHE Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00 1.00  1.00
PHE Volume:  153 136  9 18 240 228  83 21 57  3  6  3
Reduced Vol:  0  0  0  0 0  0  0 0  0  0  0  0
Reduced Vol:  153 136  9 18 240 228  83 21 57  3  6  3
PCE Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00 1.00  1.00
MLF Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00 1.00  1.00
Final Vol:  153 136  9 18 240 228  83 21 57  3  6  3

Saturation Flow Module:

Sat/Lane:    1900 1900  1900 1900 1900  1900 1900 1900  1900 1900  1900
Adjustment:  0.89 0.97  0.87  0.92 1.00  0.63  0.88 0.89  0.78  0.88 0.95  0.73
Lanes:      0.53 0.44  0.03  0.08 0.92  1.00  1.00 0.25  0.75  1.00 0.61  0.39
Final Sat.:  904 804  53 131 1752 1205 1663 415 1126 1663 1094  547

Capacity Analysis Module:

Vol/Sat:     0.17 0.17  0.17 0.14 0.14  0.19 0.05 0.05  0.05 0.00 0.01  0.01
Critic Moves:        ****  ****  ****  ****
Green Time:  32.3 32.3  32.3 26.2 26.2 35.7 9.5 11.5  11.5 8.0 10.0 10.0
Volume/Cap:  0.47 0.47  0.47 0.47 0.47 0.48 0.47 0.40  0.40 0.02 0.05  0.05
Uniform Del:  22.3 22.3  22.3 26.2 26.2 20.2 37.9 36.1  36.1 37.4 35.8  35.8
IncremntDel: 0.6  0.6  0.6 0.6 0.6  0.6 2.0 1.3  1.3 0.1  0.1  0.1
InitQueueDel: 0.0  0.0  0.0 0.0 0.0  0.0 0.0 0.0  0.0 0.0  0.0  0.0
Delay Adj:  1.00 1.00  1.00  1.00 1.00  1.00 1.00 1.00  1.00 1.00  1.00
Delay/Veh:  22.8 22.8  22.8 26.9 26.9  21.0 39.8 37.4  37.4 37.4 35.9  35.9
User DelAdj:  1.00 1.00  1.00  1.00 1.00  1.00 1.00 1.00  1.00 1.00  1.00
AdjDel/Veh:  22.8 22.8  22.8 26.9 26.9  21.0 39.8 37.4  37.4 37.4 35.9  35.9
LOS by Move:  C+  C+  C+  C  C  C+  D+  D+  D+  D+  D+  D+
HCM2kAvgQ:  7 7 7 6 6 5 3 3 3 0 0 0

Note: Queue reported is the number of cars per lane.
Intersection #3: Birch St & Sherman Ave

Street Name: Birch St
Approach: North Bound
Movement: L - T - R
Min. Green: 7 10 10
Base Vol: 69 343 38 30 14
Growth Adj: 1.00 1.00 1.00 1.00 1.00
Initial Bse: 69 343 38 30 14
Added Vol: 0 0 0 0 0
PasserByVol: 0 0 0 0 0
Initial Fut: 90 343 38 30 14
User Adj: 1.00 1.00 1.00 1.00 1.00
PHF Adj: 1.00 1.00 1.00 1.00 1.00
PHF Volume: 90 343 38 30 14
Reducut Vol: 0 0 0 0 0
Reduced Vol: 90 343 38 30 14
PCE Adj: 1.00 1.00 1.00 1.00 1.00
MLF Adj: 1.00 1.00 1.00 1.00 1.00
FinalVolume: 90 343 38 30 14
---|---|---|---|---|---|---|
Saturation Flow Module:
Adjustment: 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Lanes: 0.38 0.16 1.00 0.60 0.40 0.18 0.76
Final Sat.: 270 1065 121 611 422 281 118 510
---|---|---|---|---|---|---|
Capacity Analysis Module:
Vol/Sat: 0.33 0.32 0.31 0.05 0.03 0.04 0.10 0.10
Delay/Veh: 10.2 9.8 9.6 8.7 7.8 7.8 8.6 8.6
Delay Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
AdjDel/Veh: 10.2 9.8 9.6 8.7 7.8 7.8 8.6 8.6
LOS by Move: B A A A A A A A
ApproachDel: 9.9 8.3 8.6 8.4
Delay Adj: 1.00 1.00
ApprAdjDel: 9.9 8.3 8.6 8.4
LOS by Appr: A A A A
AllWayAvgQ: 0.5 0.4 0.4 0.0 0.0 0.1 0.1 0.1
Note: Queue reported is the number of cars per lane.
Peak Hour Volume Signal Warrant Report [Urban]
Future Volume Alternative: Peak Hour Warrant NOT Met

----|-----------------|--|-----------------|--|-----------------|--|-----------------
Approach:   North Bound   South Bound   East Bound   West Bound
Movement:   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
Control:    Stop Sign    Stop Sign    Stop Sign    Stop Sign
Lanes:      0  1  0  1  0   0  1  0  1  0   0  0  1! 0  0   0  0  1! 0  0
Initial Vol: 90  343    38    30   14    11    12   52     4     8   33    10

Major Street Volume:     526
Minor Approach Volume:   68
Minor Approach Volume Threshold: 506

--------------------------------------------------------------------------------
SIGNAL WARRANT DISCLAIMER
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"indicator" of the likelihood of an unsignalized intersection warranting
a traffic signal in the future. Intersections that exceed this warrant
are probably more likely to meet one or more of the other volume based
signal warrant (such as the 4-hour or 8-hour warrants).

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a rigorous and complete traffic signal warrant analysis by the responsible
jurisdiction. Consideration of the other signal warrants, which is beyond
the scope of this software, may yield different results.
**Intersection #3: Birch St & Sherman Ave**

**Street Name:** Birch St
**Approach:** North Bound
**Movement:** L - T - R

<table>
<thead>
<tr>
<th>Min. Green:</th>
<th>7</th>
<th>10</th>
<th>10</th>
</tr>
</thead>
</table>

**Volume Module:**
- **Base Vol:** 69 343 38 30 14 11 12 48 4 8 33 10
- **Growth Adj:** 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
- **Initial Bse:** 69 343 38 30 14 11 12 48 4 8 33 10
- **Added Vol:** 0 4 16 13 7 11 8 17 3 6 22 6
- **PasserByVol:** 21 0 0 0 0 0 0 4 0 0 0 0
- **Initial Fut:** 90 347 54 43 21 22 20 69 7 14 55 16
- **User Adj:** 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
- **PHF Adj:** 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
- **PHF Volume:** 90 347 54 43 21 22 20 69 7 14 55 16
- **Reduct Vol:** 0 0 0 0 0 0 0 0 0 0 0 0
- **Reduced Vol:** 90 347 54 43 21 22 20 69 7 14 55 16
- **PCE Adj:** 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
- **MLF Adj:** 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
- **Final Volume:** 90 347 54 43 21 22 20 69 7 14 55 16

**Saturation Flow Module:**
- **Adjustment:** 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
- **Lanes:** 581 329 345 134 461 47 107 419 122
- **Final Sat.:** 248 991 159

**Capacity Analysis Module:**
- **Vol/Sat:** 0.36 0.35 0.34 0.07 0.06 0.06 0.15 0.15 0.15 0.13 0.13 0.13
- **Crit Moves:** **** **** **** ****
- **Delay/Veh:** 10.8 10.4 10.1 9.1 8.1 8.1 9.1 9.1 9.1 8.9 8.9 8.9
- **Delay Adj:** 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
- **AdjDel/Veh:** 10.8 10.4 10.1 9.1 8.1 8.1 9.1 9.1 9.1 8.9 8.9 8.9
- **LOS by Move:** B B B A A A A A A A A
- **ApproachDel:** 10.4 8.6 9.1 8.9
- **Delay Adj:** 1.00 1.00 1.00 1.00
- **ApprAdjDel:** 10.4 8.6 9.1 8.9
- **LOS by Appr:** B A A A
- **AllWayAvgQ:** 0.5 0.5 0.5 0.1 0.1 0.2 0.2 0.2 0.1 0.1 0.1 0.1

Note: Queue reported is the number of cars per lane.

**Peak Hour Volume Signal Warrant Report [Urban]**

---

**Intersection #3: Birch St & Sherman Ave**
Future Volume Alternative: Peak Hour Warrant NOT Met

Approach: | North Bound | South Bound | East Bound | West Bound
Movement: | L - T - R | L - T - R | L - T - R | L - T - R
Control: | Stop Sign | Stop Sign | Stop Sign | Stop Sign
Lanes: | 0 1 0 1 0 | 0 1 0 1 0 | 0 0 1! 0 0 | 0 0 1! 0 0
Initial Vol: | 90 347 54 43 | 21 22 20 | 69 7 14 | 55 16

Major Street Volume: 577
Minor Approach Volume: 96
Minor Approach Volume Threshold: 474

SIGNAL WARRANT DISCLAIMER
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Level Of Service Computation Report
2000 HCM Unsignalized (Future Volume Alternative)
Background AM

Intersection #4: Birch St & Grant Ave

**Level Of Service Computation Report**

**Intersection #4: Birch St & Grant Ave**

**Street Name:** Birch St & Grant Ave

**Approach:** North Bound South Bound East Bound West Bound

**Movement:** L - T - R L - T - R L - T - R L - T - R

**Volume Module:**
- **Base Vol:** 39 417 32 15 27 13 31 35 11 0 0 0
- **Growth Adj:** 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
- **Initial Bse:** 39 417 32 15 27 13 31 35 11 0 0 0
- **Added Vol:** 0 0 0 0 0 0 0 0 0 0 0 0
- **PasserByVol:** 4 21 9 0 0 0 0 11 0 0 0 0
- **Final Fut:** 43 438 41 15 27 13 31 46 11 0 0 0
- **User Adj:** 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
- **PHF Adj:** 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
- **PHF Volume:** 43 438 41 15 27 13 31 46 11 0 0 0
- **Reduct Vol:** 0 0 0 0 0 0 0 0 0 0 0 0
- **FinalVolume:** 43 438 41 15 27 13 31 46 11 0 0 0

**Critical Gap Module:**
- **Critical Gp:** 4.1 xxxx xxxx 4.1 xxxx xxxx 6.8 6.5 6.9 xxxx xxxx xxxx
- **FollowUpTim:** 2.2 xxxx xxxx 2.2 xxxx xxxx 3.5 4.0 3.3 xxxx xxxx xxxx

**Capacity Module:**
- **Cnflict Vol:** 40 xxxx xxxx 479 xxxx xxxx 369 629 20 xxxx xxxx xxxx
- **Potent Cap.:** 1583 xxxx xxxx 1094 xxxx xxxx 610 402 1060 xxxx xxxx xxxx
- **Move Cap.:** 1583 xxxx xxxx 1094 xxxx xxxx 591 385 1060 xxxx xxxx xxxx
- **Volume/Cap:** 0.03 xxxx xxxx 0.01 xxxx xxxx 0.05 0.12 0.01 xxxx xxxx xxxx

**Level Of Service Module:**
- **2Way95thQ:** 0.1 xxxx xxxx 0.0 xxxx xxxx xxxx xxxx xxxx xxxx xxxx xxxx xxxx xxxx
- **Control Del:** 7.3 xxxx xxxx 8.3 xxxx xxxx xxxx xxxx xxxx xxxx xxxx
- **LOS by Move:** A A A A A A A A A A A A
- **Movement:** LT - LTR - RT LT - LTR - RT LT - LTR - RT LT - LTR - RT
- **Shared Cap.:** xxxx xxxx xxxx xxxx xxxx xxxx xxxx xxxx 483 xxxx xxxx xxxx xxxx xxxx
- **SharedQueue:** 0.1 xxxx xxxx 0.0 xxxx xxxx xxxx 0.7 xxxx xxxx xxxx xxxx xxxx
- **Shrd ConDel:** 7.3 xxxx xxxx 8.3 xxxx xxxx xxxx xxxx 14.1 xxxx xxxx xxxx xxxx xxxx
- **Shared LOS:** A A B B B B B B B B B B
- **ApproachDel:** xxxxxx xxxxxx xxxxxx
- **ApproachLOS:** B B B B B B B B B B B B

**Note:** Queue reported is the number of cars per lane.

---

Peak Hour Delay Signal Warrant Report

---

Intersection #4 Birch St & Grant Ave

---

Future Volume Alternative: Peak Hour Warrant NOT Met
### Approach: North Bound | South Bound | East Bound | West Bound

<table>
<thead>
<tr>
<th>Movement:</th>
<th>L - T - R</th>
<th>L - T - R</th>
<th>L - T - R</th>
<th>L - T - R</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control:</td>
<td>Uncontrolled</td>
<td>Uncontrolled</td>
<td>Stop Sign</td>
<td>Stop Sign</td>
</tr>
<tr>
<td>Lanes:</td>
<td>0 1 0 1 0</td>
<td>0 1 0 1 0</td>
<td>0 0 1 0 0</td>
<td>0 0 0 0 0</td>
</tr>
<tr>
<td>Initial Vol:</td>
<td>43 438</td>
<td>41 15 27</td>
<td>13 31 46</td>
<td>11 0 0 0</td>
</tr>
<tr>
<td>Approach Del:</td>
<td>xxxxxx</td>
<td>xxxxxx</td>
<td>14.1</td>
<td>xxxxxx</td>
</tr>
</tbody>
</table>

**Signal Warrant Rule #1:** [vehicle-hours=0.3]
FAIL - Vehicle-hours less than 4 for one lane approach.

**Signal Warrant Rule #2:** [approach volume=88]
FAIL - Approach volume less than 100 for one lane approach.

**Signal Warrant Rule #3:** [approach count=3][total volume=665]
SUCCEED - Total volume greater than or equal to 650 for intersection with less than four approaches.

---

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---

**Intersection #4 Birch St & Grant Ave**

**Future Volume Alternative: Peak Hour Warrant NOT Met**

<table>
<thead>
<tr>
<th>Approach:</th>
<th>North Bound</th>
<th>South Bound</th>
<th>East Bound</th>
<th>West Bound</th>
</tr>
</thead>
<tbody>
<tr>
<td>Movement:</td>
<td>L - T - R</td>
<td>L - T - R</td>
<td>L - T - R</td>
<td>L - T - R</td>
</tr>
<tr>
<td>Control:</td>
<td>Uncontrolled</td>
<td>Uncontrolled</td>
<td>Stop Sign</td>
<td>Stop Sign</td>
</tr>
<tr>
<td>Lanes:</td>
<td>0 1 0 1 0</td>
<td>0 1 0 1 0</td>
<td>0 0 1 0 0</td>
<td>0 0 0 0 0</td>
</tr>
<tr>
<td>Initial Vol:</td>
<td>43 438</td>
<td>41 15 27</td>
<td>13 31 46</td>
<td>11 0 0 0</td>
</tr>
<tr>
<td>Major Street Volume:</td>
<td>577</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Minor Approach Volume:</td>
<td>88</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Minor Approach Volume Threshold:** 474

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Intersection #4: Birch St & Grant Ave

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Level Of Service Computation Report
2000 HCM Unsignalized (Future Volume Alternative)
Background+Project AM

Intersection #4: Birch St & Grant Ave

Peak Hour Delay Signal Warrant Report
Future Volume Alternative: Peak Hour Warrant NOT Met
<table>
<thead>
<tr>
<th>Approach:</th>
<th>North Bound</th>
<th>South Bound</th>
<th>East Bound</th>
<th>West Bound</th>
</tr>
</thead>
<tbody>
<tr>
<td>Movement:</td>
<td>L - T - R</td>
<td>L - T - R</td>
<td>L - T - R</td>
<td>L - T - R</td>
</tr>
<tr>
<td>Control:</td>
<td>Uncontrolled</td>
<td>Uncontrolled</td>
<td>Stop Sign</td>
<td>Stop Sign</td>
</tr>
<tr>
<td>Lanes:</td>
<td>0 1 0 1 0</td>
<td>0 1 0 1 0</td>
<td>0 1 0 1 0</td>
<td>0 1 0 1 0</td>
</tr>
<tr>
<td>Initial Vol:</td>
<td>43 458 41 17 38 13 31 46 11 0 0 0 0 0 0 14.6 xxxxxx</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Approach [eastbound] [lanes=1] [control=Stop Sign]

Signal Warrant Rule #1: [vehicle-hours=0.4]
FAIL - Vehicle-hours less than 4 for one lane approach.

Signal Warrant Rule #2: [approach volume=88]
FAIL - Approach volume less than 100 for one lane approach.

Signal Warrant Rule #3: [approach count=3] [total volume=698]
SUCCEED - Total volume greater than or equal to 650 for intersection with less than four approaches.

SIGNAL WARRANT DISCLAIMER
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Future Volume Alternative: Peak Hour Warrant NOT Met

<table>
<thead>
<tr>
<th>Approach:</th>
<th>North Bound</th>
<th>South Bound</th>
<th>East Bound</th>
<th>West Bound</th>
</tr>
</thead>
<tbody>
<tr>
<td>Movement:</td>
<td>L - T - R</td>
<td>L - T - R</td>
<td>L - T - R</td>
<td>L - T - R</td>
</tr>
<tr>
<td>Control:</td>
<td>Uncontrolled</td>
<td>Uncontrolled</td>
<td>Stop Sign</td>
<td>Stop Sign</td>
</tr>
<tr>
<td>Lanes:</td>
<td>0 1 0 1 0</td>
<td>0 1 0 1 0</td>
<td>0 1 0 1 0</td>
<td>0 1 0 1 0</td>
</tr>
<tr>
<td>Initial Vol:</td>
<td>43 458 41 17 38 13 31 46 11 0 0 0 0 0 0 14.6 xxxxxx</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Major Street Volume: 610
Minor Approach Volume: 88
Minor Approach Volume Threshold: 455

SIGNAL WARRANT DISCLAIMER
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### Level Of Service Computation Report
#### 2000 HCM Unsignalized (Future Volume Alternative)
**Background AM**

**Intersection #5: Birch St & Sheridan Ave**

**Signal=Uncontrol/Rights=Include**

**Final Vol:**
- Lanes: 0 1 0 2 0

**Lanes:**
- Initial Fut: 144 511 295

**Critical Gap Module:**
- Critical Gp: 4.1 xxxx xxxx 4.1 xxxx xxxx 7.1 6.5 6.2 7.1 6.5 6.2

**FollowUpTim:**
- 2.2 xxxx xxxx 3.5 4.0 3.3 3.5 4.0 3.3

**Capacity Module:**
- Cnflict Vol: 17 xxxx xxxx 806 xxxx xxxx 1012 1149 9 1011 1004 659

**Move Cap.:**
- 1613 xxxx xxxx 828 xxxx xxxx 220 200 1079 220 244 467

**Volume/Cap:**
- 0.09 xxxx xxxx 0.02 xxxx xxxx 0.05 0.20 0.00 0.08 0.07 0.01

**Level Of Service Module:**
- 2Way95thQ: 0.3 xxxx xxxx 0.1 xxxx xxxx xxxx xxxx xxxx xxxx xxxx xxxx xxxx xxxx

**Control Del:**
- 7.4 xxxx xxxx 9.5 xxxx xxxx xxxx xxxx xxxx xxxx xxxx xxxx xxxx xxxx

**LOS by Move:**
- A A A A A A A A A A

**Movement:**
- LT - LTR - RT LT - LTR - RT LT - LTR - RT LT - LTR - RT

**Shared Cap.:**
- xxxxx xxxx xxxx xxxx xxxx xxxx 185 xxxxx xxxx 211 xxxxx

**SharedQueue:**
- 0.1 xxxx xxxx xxxx 0.00 0.00 0.6 xxxx

**Shrd ConDel:**
- 9.5 xxxx xxxx xxxx 31.0 xxxx xxxx 25.3 xxxx

**Shrd LOS:**
- * A A A A A A A A A A

**ApproachDel:**
- xxxxx xxxxx 31.0 25.3

**ApproachLOS:**
- * D D

**Note:** Queue reported is the number of cars per lane.

---

**Peak Hour Delay Signal Warrant Report**

---

**Intersection #5 Birch St & Sheridan Ave**

**Future Volume Alternative: Peak Hour Warrant NOT Met**
<table>
<thead>
<tr>
<th>Approach: North Bound</th>
<th>South Bound</th>
<th>East Bound</th>
<th>West Bound</th>
</tr>
</thead>
<tbody>
<tr>
<td>Movement: L - T - R</td>
<td>L - T - R</td>
<td>L - T - R</td>
<td>L - T - R</td>
</tr>
<tr>
<td>Control: Uncontrolled</td>
<td>Uncontrolled</td>
<td>Stop Sign</td>
<td>Stop Sign</td>
</tr>
<tr>
<td>Lanes: 0 0 1! 0</td>
<td>0 1 0 1</td>
<td>0 0 1! 0</td>
<td>0 0 1! 0</td>
</tr>
<tr>
<td>Initial Vol: 144 411</td>
<td>295 20 13</td>
<td>4 9 36 2</td>
<td>14 14 6</td>
</tr>
<tr>
<td>Approach Delay: xxxxxxx x</td>
<td>31.0</td>
<td>25.3</td>
<td></td>
</tr>
</tbody>
</table>

Approach [eastbound] [lanes=1] [control=Stop Sign]

- **Signal Warrant Rule #1**: [vehicle-hours=0.4]
  - FAIL - Vehicle-hours less than 4 for one lane approach.

- **Signal Warrant Rule #2**: [approach volume=47]
  - FAIL - Approach volume less than 100 for one lane approach.

- **Signal Warrant Rule #3**: [approach count=4] [total volume=1068]
  - SUCCEED - Total volume greater than or equal to 800 for intersection with four or more approaches.

--------------------------------------------------------------------------------

Approach [westbound] [lanes=1] [control=Stop Sign]

- **Signal Warrant Rule #1**: [vehicle-hours=0.2]
  - FAIL - Vehicle-hours less than 4 for one lane approach.

- **Signal Warrant Rule #2**: [approach volume=34]
  - FAIL - Approach volume less than 100 for one lane approach.

- **Signal Warrant Rule #3**: [approach count=4] [total volume=1068]
  - SUCCEED - Total volume greater than or equal to 800 for intersection with four or more approaches.

--------------------------------------------------------------------------------

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**Peak Hour Volume Signal Warrant Report [Urban]**

**Intersection #5 Birch St & Sheridan Ave**

**Future Volume Alternative: Peak Hour Warrant NOT Met**

<table>
<thead>
<tr>
<th>Approach: North Bound</th>
<th>South Bound</th>
<th>East Bound</th>
<th>West Bound</th>
</tr>
</thead>
<tbody>
<tr>
<td>Movement: L - T - R</td>
<td>L - T - R</td>
<td>L - T - R</td>
<td>L - T - R</td>
</tr>
<tr>
<td>Control: Uncontrolled</td>
<td>Uncontrolled</td>
<td>Stop Sign</td>
<td>Stop Sign</td>
</tr>
<tr>
<td>Lanes: 0 0 1! 0</td>
<td>0 1 0 1</td>
<td>0 0 1! 0</td>
<td>0 0 1! 0</td>
</tr>
<tr>
<td>Initial Vol: 144 411</td>
<td>295 20 13</td>
<td>4 9 36 2</td>
<td>14 14 6</td>
</tr>
<tr>
<td>Major Street Volume:</td>
<td>987</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Minor Approach Volume:</td>
<td>47</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Minor Approach Volume Threshold:</td>
<td>289</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**SIGNAL WARRANT DISCLAIMER**

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Level Of Service Computation Report
2000 HCM Unsignalized (Future Volume Alternative)
Background=Project AM

Intersection #5: Birch St & Sheridan Ave

**Street Name:** Birch St & Sheridan Ave

**Approach:**
- North Bound: L - T - R
- South Bound: L - T - R
- East Bound: L - T - R
- West Bound: L - T - R

**Volume Module:**

<table>
<thead>
<tr>
<th>Movement</th>
<th>North Bound</th>
<th>South Bound</th>
<th>East Bound</th>
<th>West Bound</th>
</tr>
</thead>
<tbody>
<tr>
<td>Base Vol</td>
<td>144 477</td>
<td>246 20</td>
<td>13 4</td>
<td>9 36 2</td>
</tr>
<tr>
<td>Growth Adj</td>
<td>1.00 1.00</td>
<td>1.00 1.00</td>
<td>1.00 1.00</td>
<td>1.00 1.00</td>
</tr>
<tr>
<td>Initial Bse</td>
<td>144 477</td>
<td>246 20</td>
<td>13 4</td>
<td>9 36 2</td>
</tr>
<tr>
<td>Added Vol</td>
<td>0 20 0</td>
<td>0 11 0</td>
<td>0 0 0</td>
<td>0 0 0 0</td>
</tr>
<tr>
<td>PasserByVol</td>
<td>0 34 49</td>
<td>0 0 0</td>
<td>0 0 0 0</td>
<td>0 0 0 0</td>
</tr>
<tr>
<td>Initial Fut</td>
<td>144 531</td>
<td>295 20</td>
<td>24 4</td>
<td>9 36 2</td>
</tr>
<tr>
<td>User Adj</td>
<td>1.00 1.00</td>
<td>1.00 1.00</td>
<td>1.00 1.00</td>
<td>1.00 1.00</td>
</tr>
<tr>
<td>PHF Adj</td>
<td>1.00 1.00</td>
<td>1.00 1.00</td>
<td>1.00 1.00</td>
<td>1.00 1.00</td>
</tr>
<tr>
<td>PHF Volume</td>
<td>144 531</td>
<td>295 20</td>
<td>24 4</td>
<td>9 36 2</td>
</tr>
<tr>
<td>Reduct Vol</td>
<td>0 0 0 0</td>
<td>0 0 0 0</td>
<td>0 0 0 0</td>
<td>0 0 0 0</td>
</tr>
<tr>
<td>FinalVolume</td>
<td>144 531</td>
<td>295 20</td>
<td>24 4</td>
<td>9 36 2</td>
</tr>
</tbody>
</table>

**Critical Gap Module:**

| Critical Gp       | 4.1 xxxx xxxxx | 4.1 xxxx xxxxx | 7.1 6.5 6.2 | 7.1 6.5 6.2 |
| FollowUpTim       | 2.2 xxxx xxxxx | 2.2 xxxx xxxxx | 3.5 4.0 3.3 | 3.5 4.0 3.3 |

**Capacity Module:**

| Cnflict Vol       | 28 xxxx xxxxx | 826 xxxx xxxxx | 1043 1180 14 | 1037 1035 679 |
| Potent Cap.:      | 1599 xxxx xxxxx | 813 xxxx xxxxx | 209 192 1072 | 211 234 455 |
| Move Cap.:        | 1599 xxxx xxxxx | 813 xxxx xxxxx | 178 169 1072 | 161 206 455 |
| Volume/Cap:       | 0.09 xxxx xxxxx | 0.02 xxxx xxxxx | 0.05 0.21 0.00 | 0.09 0.07 0.01 |

**Level Of Service Module:**

| 2Way95thQ:        | 0.3 xxxx xxxxx | 0.1 xxxx xxxxx | 0.1 xxxx xxxxx | 0.05 0.21 0.00 |
| Control Del:      | 7.5 xxxx xxxxx | 9.5 xxxx xxxxx | 9.5 xxxx xxxxx | 26.4 xxxx xxxxx |
| Movement:         | LT - LTR - RT  | LT - LTR - RT  | LT - LTR - RT  | LT - LTR - RT  |
| Shared Cap.:      | xxxx xxxx xxxx | xxxx xxxx xxxx | xxxx xxxx xxxx | 177 xxxx xxxx xxxx |
| SharedQueue:      | 0.1 xxxx xxxx 1.0 xxxx xxxx | 0.1 xxxx xxxx 0.6 xxxx xxxx |
| Shrd ConDel:      | 9.5 xxxx xxxx xxxx 32.6 xxxx xxxx xxxx 26.4 xxxx xxxx |
| ApproachDel:      | xxxxxx xxxxxx 32.6 26.4 |
| ApproachLOS:      | * D D |

**Note:** Queue reported is the number of cars per lane.

Peak Hour Delay Signal Warrant Report

Intersection #5 Birch St & Sheridan Ave

Future Volume Alternative: Peak Hour Warrant NOT Met
### Approach:

<table>
<thead>
<tr>
<th>Movement:</th>
<th>North Bound</th>
<th>South Bound</th>
<th>East Bound</th>
<th>West Bound</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control:</td>
<td>Uncontrolled</td>
<td>Uncontrolled</td>
<td>Stop Sign</td>
<td>Stop Sign</td>
</tr>
<tr>
<td>Lanes:</td>
<td>0 0 1! 0 0 0 1 0 1 0 0 0 1! 0 0 0 0 1! 0 0</td>
<td>20 24 4 9 36 2 14 14 6</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Initial Vol:** 144 531 295 20 24 4 9 36 2 14 14 6

### Approach Del:

|x|x|x|
|x|x|x|
|x|x|x|
|x|x|x|

**Approach Del:** xxxxxx

### Approach[Eastbound][lanes=1][control=Stop Sign]

- **Signal Warrant Rule #1:** [vehicle-hours=0.4]
  - FAIL - Vehicle-hours less than 4 for one lane approach.
- **Signal Warrant Rule #2:** [approach volume=47]
  - FAIL - Approach volume less than 100 for one lane approach.
- **Signal Warrant Rule #3:** [approach count=4][total volume=1099]
  - SUCCEED - Total volume greater than or equal to 800 for intersection with four or more approaches.

### Approach[Westbound][lanes=1][control=Stop Sign]

- **Signal Warrant Rule #1:** [vehicle-hours=0.2]
  - FAIL - Vehicle-hours less than 4 for one lane approach.
- **Signal Warrant Rule #2:** [approach volume=34]
  - FAIL - Approach volume less than 100 for one lane approach.
- **Signal Warrant Rule #3:** [approach count=4][total volume=1099]
  - SUCCEED - Total volume greater than or equal to 800 for intersection with four or more approaches.

### SIGNAL WARRANT DISCLAIMER

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---

**Intersection #5 Birch St & Sheridan Ave**

**Future Volume Alternative:** Peak Hour Warrant NOT Met

<table>
<thead>
<tr>
<th>Movement:</th>
<th>North Bound</th>
<th>South Bound</th>
<th>East Bound</th>
<th>West Bound</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control:</td>
<td>Uncontrolled</td>
<td>Uncontrolled</td>
<td>Stop Sign</td>
<td>Stop Sign</td>
</tr>
<tr>
<td>Lanes:</td>
<td>0 0 1! 0 0 0 1 0 1 0 0 0 1! 0 0 0 0 1! 0 0</td>
<td>20 24 4 9 36 2 14 14 6</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Major Street Volume:** 1018

**Minor Approach Volume:** 47

**Minor Approach Volume Threshold:** 279

**SIGNAL WARRANT DISCLAIMER**

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### Level Of Service Computation Report

**2000 HCM 4-Way Stop (Future Volume Alternative)**

**Background AM**

#### Intersection #6: Ash St & California Ave

**Final Volume Report**

<table>
<thead>
<tr>
<th>Movement</th>
<th>L - T - R</th>
<th>L - T - R</th>
<th>L - T - R</th>
<th>L - T - R</th>
</tr>
</thead>
<tbody>
<tr>
<td>Min. Green:</td>
<td>7 10 10 7 10 10</td>
<td>7 10 10 7 10 10</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Volume Module**

- **Base Vol:** 36 0 33 0 0 0 0 85 28 13 172 0
- **Growth Adj:** 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
- **Initial Bse:** 36 0 33 0 0 0 0 85 28 13 172 0
- **Added Vol:** 0 0 0 0 0 0 0 7 0 0 0 0
- **PasserByVol:** 0 0 0 0 0 0 0 7 0 0 0 0
- **Initial Fut:** 36 0 33 0 0 0 0 92 28 13 172 0
- **User Adj:** 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
- **PHF Adj:** 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
- **PHF Volume:** 36 0 33 0 0 0 0 92 28 13 172 0
- **Reduct Vol:** 0 0 0 0 0 0 0 0 0 0 0 0
- **Reduced Vol:** 36 0 33 0 0 0 0 92 28 13 172 0
- **PCE Adj:** 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
- **MLF Adj:** 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
- **FinalVolume:** 36 0 33 0 0 0 0 92 28 13 172 0

**Saturation Flow Module**

- **Adjustment:** 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
- **Lanes:** 0.52 0.00 0.48 0.00 0.00 0.00 0.00 1.00 1.00 0.07 0.93 0.00
- **Final Sat.:** 408 0 374 0 0 0 0 742 867 58 769 0

**Capacity Analysis Module**

- **Vol/Sat:** 0.09 xxxx 0.09 xxxx xxxx xxxx xxxx 0.12 0.03 0.22 0.22 xxxx
- **Crit Moves:** **** **** ****
- **Delay/Veh:** 7.8 0.0 7.8 0.0 0.0 0.0 0.0 8.1 6.9 8.5 8.5 0.0
- **Delay Adj:** 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
- **AdjDel/Veh:** 7.8 0.0 7.8 0.0 0.0 0.0 0.0 8.1 6.9 8.5 8.5 0.0
- **ApproachDel:** 7.8 xxxxxx 7.8 8.5
- **Delay Adj:** 1.00 xxxxxx 1.00 1.00
- **ApprAdjDel:** 7.8 xxxxxx 7.8 8.5
- **LOS by Appr:** A A A A
- **AllWayAvgQ:** 0.1 0.1 0.1 0.0 0.0 0.0 0.0 0.1 0.0 0.3 0.3 0.3

*Note: Queue reported is the number of cars per lane.*

---

**Peak Hour Volume Signal Warrant Report [Urban]**

---

**Intersection #6 Ash St & California Ave**

---

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Future Volume Alternative: Peak Hour Warrant NOT Met

<table>
<thead>
<tr>
<th>Approach:</th>
<th>North Bound</th>
<th>South Bound</th>
<th>East Bound</th>
<th>West Bound</th>
</tr>
</thead>
<tbody>
<tr>
<td>Movement:</td>
<td>L - T - R</td>
<td>L - T - R</td>
<td>L - T - R</td>
<td>L - T - R</td>
</tr>
<tr>
<td>Control:</td>
<td>Stop Sign</td>
<td>Stop Sign</td>
<td>Stop Sign</td>
<td>Stop Sign</td>
</tr>
<tr>
<td>Lanes:</td>
<td>0 0 1! 0 0</td>
<td>0 0 0 0 0</td>
<td>0 0 1 0 1</td>
<td>0 1 0 0 0</td>
</tr>
<tr>
<td>Initial Vol:</td>
<td>36 0 33</td>
<td>0 0 0 0 0</td>
<td>0 0 92 28</td>
<td>13 172 0</td>
</tr>
</tbody>
</table>

Major Street Volume: 305
Minor Approach Volume: 69
Minor Approach Volume Threshold: 694

SIGNAL WARRANT DISCLAIMER
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**Intersection #6: Ash St & California Ave**

**Level Of Service Computation Report**

**2000 HCM 4-Way Stop (Future Volume Alternative)**

**Background+Project AM**

**Final Vol:** 0 0 0 0

**Signal=Stop**

**Cycle Time (sec):** 100

**Loss Time (sec):** 0

**Critical V/C:** 0.246

**Avg Crit Del (sec/veh):** 8.3

**Avg Delay (sec/veh):** 8.3

**LOS:** A

**Street Name:** Ash St & California Ave

**Approach:**

<table>
<thead>
<tr>
<th>Movement</th>
<th>North Bound</th>
<th>South Bound</th>
<th>East Bound</th>
<th>West Bound</th>
</tr>
</thead>
<tbody>
<tr>
<td>L - T - R</td>
<td>L - T - R</td>
<td>L - T - R</td>
<td>L - T - R</td>
<td></td>
</tr>
</tbody>
</table>

**Min. Green:** 7 10 10 7 10 10

**Volume Module:**

<table>
<thead>
<tr>
<th>Base Vol:</th>
<th>36</th>
<th>0</th>
<th>33</th>
<th>0</th>
<th>0</th>
<th>0</th>
<th>0</th>
<th>85</th>
<th>28</th>
<th>13 172</th>
</tr>
</thead>
<tbody>
<tr>
<td>Growth Adj:</td>
<td>1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Initial Bse:</td>
<td>36</td>
<td>0</td>
<td>33</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>85</td>
<td>28</td>
<td>13 172</td>
</tr>
<tr>
<td>Added Vol:</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>16</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>PasserByVol:</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>7</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>User Adj:</td>
<td>1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PHF Adj:</td>
<td>1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PHF Volume:</td>
<td>39</td>
<td>0</td>
<td>33</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>108</td>
<td>28</td>
<td>13 189</td>
</tr>
<tr>
<td>Reduct Vol:</td>
<td>39</td>
<td>0</td>
<td>33</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>108</td>
<td>28</td>
<td>13 189</td>
</tr>
<tr>
<td>PCE Adj:</td>
<td>1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MLI Adj:</td>
<td>1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Final Volume:</td>
<td>39</td>
<td>0</td>
<td>33</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>108</td>
<td>28</td>
<td>13 189</td>
</tr>
</tbody>
</table>

**Saturation Flow Module:**

| Lanes: | 0.54 0.00 0.46 0.00 0.00 0.00 0.00 1.00 1.00 0.06 0.94 0.00 |
| Final Sat.: | 413 | 0 | 349 | 0 | 0 | 0 | 0 | 738 | 862 | 53 769 |

**Capacity Analysis Module:**

| Vol/Sat: | 0.09 xxxx 0.09 xxxx xxxx xxxx xxxx 0.15 0.03 0.25 0.25 xxxx |
| Crit Moves: | **** | **** | **** |
| Delay/Veh: | 7.9 0.0 7.9 0.0 0.0 0.0 0.0 8.3 6.9 8.7 8.7 0.0 |
| Delay Adj: | 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 |
| AdjDel/Veh: | 7.9 0.0 7.9 0.0 0.0 0.0 0.0 8.3 6.9 8.7 8.7 0.0 |
| LOS by Move: | A * A * * * A A A A |
| ApproachDel: | 7.9 | xxxxxx | 8.0 | 8.7 |
| Delay Adj: | 1.00 | xxxxxx | 1.00 | 1.00 |
| ApprAdjDel: | 7.9 | xxxxxx | 8.0 | 8.7 |
| LOS by Appr: | A | A | A |
| AllWayAvgQ: | 0.1 0.1 0.1 0.0 0.0 0.0 0.0 0.2 0.0 0.3 0.3 0.3 |

**Note:** Queue reported is the number of cars per lane.

---

**Peak Hour Volume Signal Warrant Report [Urban]**

**Intersection #6 Ash St & California Ave**

---

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Future Volume Alternative: Peak Hour Warrant NOT Met

<table>
<thead>
<tr>
<th></th>
<th>North Bound</th>
<th>South Bound</th>
<th>East Bound</th>
<th>West Bound</th>
</tr>
</thead>
<tbody>
<tr>
<td>Movement:</td>
<td>L - T - R</td>
<td>L - T - R</td>
<td>L - T - R</td>
<td>L - T - R</td>
</tr>
<tr>
<td>Control:</td>
<td>Stop Sign</td>
<td>Stop Sign</td>
<td>Stop Sign</td>
<td>Stop Sign</td>
</tr>
<tr>
<td>Lanes:</td>
<td>0 0 1! 0 0 0 0 0 0 0 0 0 0 1 0 1 0 1 0 0 0 0 0 0 108 28 13 189 0</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- Major Street Volume: 338
- Minor Approach Volume: 72
- Minor Approach Volume Threshold: 659

SIGNAL WARRANT DISCLAIMER

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Level Of Service Computation Report
2000 HCM Operations (Future Volume Alternative)
Background AM

Intersection #7: ECR & Cambridge Ave

Final Vol: 44 1313 52
Lanes: 0 1 2 0 1

Final Vol: 33 0
Lanes: 0 1

Final Vol: 11 11 0
Lanes: 0 1

Final Vol: 14 0
Lanes: 0 1

Street Name: ECR Cambridge Ave
Approach: North Bound South Bound East Bound West Bound

Min. Green: 7 10 10 7 10 10 7 10 10
Y+R: 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0

Volume Module:
Base Vol: 17 1529 26 49 1224 42 33 9 14 28 16 94
Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse: 17 1529 26 49 1224 42 33 9 14 28 16 94
Added Vol: 0 0 0 0 0 0 0 0 0 0 0 0
PasserByVol: 1 91 1 3 89 2 0 2 0 0 0 0
Initial Fut: 18 1620 27 52 1313 44 33 11 14 28 16 94
User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Volume: 18 1620 27 52 1313 44 33 11 14 28 16 94
Reduced Vol: 18 1620 27 52 1313 44 33 11 14 28 16 94
PCE Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
MLF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
FinalVolume: 18 1620 27 52 1313 44 33 11 14 28 16 94

Saturation Flow Module:
Sat/Lane: 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900
Adjustment: 0.92 1.00 0.92 1.00 0.92 1.00 0.92 1.00 0.92 1.00 0.92 1.00
Lanes: 1.00 2.95 0.05 1.00 2.89 0.11 0.58 0.18 0.24 0.66 0.34 1.00
Final Sat.: 1750 5599 93 1750 5500 184 1011 337 429 1147 655 1750

Capacity Analysis Module:
Vol/Sat: 0.01 0.29 0.29 0.03 0.24 0.24 0.03 0.03 0.03 0.02 0.02 0.05
Crit Moves: **** ****
Green Time: 19.3 107 107.1 11.0 98.8 98.8 19.9 19.9 19.9 19.9 19.9 19.9
Volume/Cap: 0.08 0.41 0.41 0.41 0.36 0.36 0.25 0.25 0.25 0.18 0.18 0.41
Uniform Del: 57.5 8.6 8.6 66.4 11.5 11.5 58.3 58.3 58.3 57.8 57.8 59.6
IncremntDel: 0.2 0.1 0.1 2.1 0.1 0.1 0.5 0.5 0.5 0.4 0.4 1.2
InitQueueDel: 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0
Delay Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Delay/Veh: 57.7 8.7 8.7 68.5 11.5 11.5 58.9 58.9 58.9 58.2 58.2 60.8
User DelAdj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
AdjDel/Veh: 57.7 8.7 8.7 68.5 11.5 11.5 58.9 58.9 58.9 58.2 58.2 60.8
LOS by Move: E+ A A E B+ B+ E+ E+ E+ E+ E+ E
HCM2kAvgQ: 1 10 10 3 9 9 3 3 3 2 2 5
Note: Queue reported is the number of cars per lane.
### Intersection #7: ECR & Cambridge Ave

#### Level Of Service Computation Report

**2000 HCM Operations (Future Volume Alternative)**

**Background+Project AM**

**Intersection #7: ECR & Cambridge Ave**

<table>
<thead>
<tr>
<th>Final Vol:</th>
<th>44</th>
<th>1319</th>
<th>52***</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lanes:</td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
</tbody>
</table>

**Signal=Protect/Rights=Include**

<table>
<thead>
<tr>
<th>Final Vol:</th>
<th>33</th>
<th>0</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lanes:</td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
</tbody>
</table>

**Signal=Permit**

<table>
<thead>
<tr>
<th>Final Vol:</th>
<th>11</th>
<th>1</th>
<th>0</th>
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<tbody>
<tr>
<td>Lanes:</td>
<td>0</td>
<td>1</td>
<td>0</td>
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</tbody>
</table>

**Signal=Permit**

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<thead>
<tr>
<th>Final Vol:</th>
<th>14</th>
<th>0</th>
<th>0</th>
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</thead>
<tbody>
<tr>
<td>Lanes:</td>
<td>0</td>
<td>1</td>
<td>0</td>
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**Critical V/C: 0.406**

<table>
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<th>Cycle Time (sec):</th>
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<tbody>
<tr>
<td>Loss Time (sec):</td>
<td>12</td>
</tr>
<tr>
<td>Avg Crit Del (sec/veh):</td>
<td>13.1</td>
</tr>
<tr>
<td>Avg Delay (sec/veh):</td>
<td>14.1</td>
</tr>
</tbody>
</table>

**Street Name:**

- **ECR**
- **Cambridge Ave**

**Approach:**

- **North Bound**
- **South Bound**
- **East Bound**
- **West Bound**

**Movement:**

<table>
<thead>
<tr>
<th>Min. Green:</th>
<th>7 10 10 7 10 10 7 10 10 7 10 10</th>
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</thead>
<tbody>
<tr>
<td>Y+R:</td>
<td>4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0</td>
</tr>
</tbody>
</table>

**Volume Module:**

<table>
<thead>
<tr>
<th>Base Vol:</th>
<th>17 1529 26 49 1224 42 33 9 14 28 16 94</th>
</tr>
</thead>
<tbody>
<tr>
<td>Growth Adj:</td>
<td>1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00</td>
</tr>
<tr>
<td>Initial Bse:</td>
<td>17 1529 26 49 1224 42 33 9 14 28 16 94</td>
</tr>
<tr>
<td>Added Vol:</td>
<td>0 6 0 0 6 0 0 0 0 0 0 0</td>
</tr>
<tr>
<td>PasserByVol:</td>
<td>1 91 1 3 89 2 0 2 0 0 0 0</td>
</tr>
<tr>
<td>Initial Fut:</td>
<td>18 1626 27 52 1319 44 33 11 14 28 16 94</td>
</tr>
<tr>
<td>User Adj:</td>
<td>1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00</td>
</tr>
<tr>
<td>PHE Volume:</td>
<td>18 1626 27 52 1319 44 33 11 14 28 16 94</td>
</tr>
<tr>
<td>Reduct Vol:</td>
<td>0 0 0 0 0 0 0 0 0 0 0 0</td>
</tr>
<tr>
<td>PCE Adj:</td>
<td>1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00</td>
</tr>
<tr>
<td>MLP Adj:</td>
<td>1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00</td>
</tr>
<tr>
<td>FinalVolume:</td>
<td>18 1626 27 52 1319 44 33 11 14 28 16 94</td>
</tr>
</tbody>
</table>

**Saturation Flow Module:**

<table>
<thead>
<tr>
<th>Sat/Lane:</th>
<th>1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adjustment:</td>
<td>0.92 0.92 0.92 0.92 0.92 0.92 0.92 0.92 0.92 0.92 0.92 0.92 0.92</td>
</tr>
<tr>
<td>Lanes:</td>
<td>1.00 2.95 0.05 1.00 2.90 0.10 0.58 0.18 0.24 0.66 0.34 1.00 1.00</td>
</tr>
<tr>
<td>Final Sat.:</td>
<td>1750 5599 93 1750 5501 183 1011 337 429 1147 655 1750 1750</td>
</tr>
</tbody>
</table>

**Capacity Analysis Module:**

<table>
<thead>
<tr>
<th>Vol/Sat:</th>
<th>0.01 0.29 0.29 0.03 0.24 0.24 0.03 0.03 0.03 0.02 0.02 0.05</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crit Moves:</td>
<td>**** ****</td>
</tr>
<tr>
<td>Green Time:</td>
<td>19.3 107 107.2 11.0 98.9 98.9 19.8 19.8 19.8 19.8 19.8 19.8 19.8</td>
</tr>
<tr>
<td>Volume/Cap:</td>
<td>0.08 0.41 0.41 0.41 0.36 0.36 0.25 0.25 0.25 0.18 0.18 0.41</td>
</tr>
<tr>
<td>Uniform Del:</td>
<td>57.6 8.6 8.6 66.4 11.4 11.4 58.4 58.4 58.4 58.4 58.4 58.4</td>
</tr>
<tr>
<td>IncremntDel:</td>
<td>0.2 0.1 0.1 2.1 0.1 0.1 0.6 0.6 0.6 0.6 0.4 0.4 1.2</td>
</tr>
<tr>
<td>InitQueuDel:</td>
<td>0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0</td>
</tr>
<tr>
<td>Delay Adj:</td>
<td>1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00</td>
</tr>
<tr>
<td>Delay/Veh:</td>
<td>57.7 8.7 8.7 68.5 11.5 11.5 58.9 58.9 58.9 58.9 58.9 58.9 58.9</td>
</tr>
<tr>
<td>User DelAdj:</td>
<td>1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00</td>
</tr>
<tr>
<td>AdjDel/Veh:</td>
<td>57.7 8.7 8.7 68.5 11.5 11.5 58.9 58.9 58.9 58.9 58.9 58.9 58.9</td>
</tr>
<tr>
<td>LOS by Move:</td>
<td>E+ A A E B+ B+ E+ E+ E+ E+ E+ E+</td>
</tr>
<tr>
<td>HCM2kAvgQ:</td>
<td>1 10 10 3 9 9 3 3 3 2 2 5</td>
</tr>
</tbody>
</table>

**Note:** Queue reported is the number of cars per lane.
Level Of Service Computation Report
2000 HCM Operations (Future Volume Alternative)
Background AM

Intersection #8: ECR & California Ave

Final Vol: 153
Lanes: 0 1 0 2 0 1

Final Vol: 1094
Lanes: 0 1 0 2 0 1

Final Vol: 79***
Lanes: 0 1 0 2 0 1

Signal=Protect
Rights=Include

Vol Cnt Date: n/a
Cycle Time (sec): 150

Loss Time (sec): 12

Critical V/C: 0.453
Avg Crit Del (sec/veh): 19.7
Avg Delay (sec/veh): 22.1

LOS: C+

Average Critical Delays (sec/veh):

<table>
<thead>
<tr>
<th>Movement</th>
<th>North Bound</th>
<th>South Bound</th>
<th>East Bound</th>
<th>West Bound</th>
</tr>
</thead>
<tbody>
<tr>
<td>Min. Green:</td>
<td>7 10 10</td>
<td>7 10 10</td>
<td>7 10 10</td>
<td>7 10 10</td>
</tr>
<tr>
<td>Y+R: 4.0</td>
<td>4.0</td>
<td>4.0</td>
<td>4.0</td>
<td>4.0</td>
</tr>
</tbody>
</table>

Volume Module:
Base Vol: 100 1513 54 60 1023 144 33 27 53 60 74 66
Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse: 100 1513 54 60 1023 144 33 27 53 60 74 66
Added Vol: 0 0 0 0 0 0 0 0 0 0 0 0
PasserByVol: 5 90 3 19 71 9 4 2 0 0 0 1
Initial Fut: 105 1603 57 79 1094 153 37 29 53 60 74 66
User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Volume: 105 1603 57 79 1094 153 37 29 53 60 74 66
Reduced Vol: 105 1603 57 79 1094 153 37 29 53 60 74 66
PCE Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
MLF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
FinalVolume: 105 1603 57 79 1094 153 37 29 53 60 74 66

Saturation Flow Module:
Sat/Lane: 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900
Adjustment: 0.92 1.00 0.92 1.00 0.92 1.00 0.92 1.00 0.92 1.00 0.92 1.00
Lanes: 1.00 2.89 0.11 1.00 2.60 0.40 1.00 0.34 0.66 1.00 1.00 1.00
Final Sat.: 1750 5488 195 1750 4949 692 1750 637 1164 1750 1900 1750

Capacity Analysis Module:
Vol/Sat: 0.06 0.29 0.29 0.05 0.22 0.22 0.02 0.05 0.05 0.03 0.04 0.04
Crit Moves: **** **** **** ****
Green Time: 23.8 96.6 96.6 14.9 87.8 87.8 10.9 15.1 15.1 11.3 15.5 15.5
Volume/Cap: 0.38 0.45 0.45 0.45 0.45 0.45 0.45 0.45 0.45 0.45 0.45 0.45
Uniform Del: 56.5 13.4 13.4 63.7 16.6 16.6 65.9 63.6 63.6 66.4 62.7 62.6
IncrementDel: 0.9 0.1 0.1 1.9 0.1 0.1 1.3 1.8 1.8 2.5 1.2 1.2
InitQueueDel: 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0
Delay Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Delay/Veh: 57.3 13.5 13.5 65.6 16.6 16.6 67.2 65.4 65.4 68.8 63.9 63.9
User Del/Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
AdjDel/Veh: 57.3 13.5 13.5 65.6 16.6 16.6 67.2 65.4 65.4 68.8 63.9 63.9
LOS by Move: E+ B B B E B E B E E E E
HCM2kAvgQ: 5 12 12 4 10 10 2 4 4 3 3 3

Note: Queue reported is the number of cars per lane.
Intersection #8: ECR & California Ave

**Level Of Service Computation Report**

2000 HCM Operations (Future Volume Alternative)
Background+Project AM

**Final Volume:**

<table>
<thead>
<tr>
<th>Lanes</th>
<th>Signal=Protect</th>
<th>Rights=Include</th>
<th>Vol Cnt Date:</th>
<th>Cycle Time (sec):</th>
<th>Final Vol:</th>
</tr>
</thead>
<tbody>
<tr>
<td>105</td>
<td>0</td>
<td>1</td>
<td>n/a</td>
<td>150</td>
<td>1</td>
</tr>
<tr>
<td>103</td>
<td>0</td>
<td>1</td>
<td>0</td>
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</tr>
<tr>
<td>108</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>106</td>
<td>0</td>
<td>1</td>
<td>0</td>
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<td>1</td>
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**Final Volume:**

<table>
<thead>
<tr>
<th>Lanes</th>
<th>Signal=Protect</th>
<th>Rights=Include</th>
<th>Vol Cnt Date:</th>
<th>Cycle Time (sec):</th>
<th>Final Vol:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0</td>
<td>1</td>
<td>n/a</td>
<td>150</td>
<td>1</td>
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<tr>
<td>2</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>3</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>4</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td></td>
<td>1</td>
</tr>
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</table>

**Street Name:**

ECR                          California Ave

**Approach:**

<table>
<thead>
<tr>
<th>Movement</th>
<th>North Bound</th>
<th>South Bound</th>
<th>East Bound</th>
<th>West Bound</th>
</tr>
</thead>
<tbody>
<tr>
<td>L - T - R</td>
<td>L - T - R</td>
<td>L - T - R</td>
<td>L - T - R</td>
<td>L - T - R</td>
</tr>
</tbody>
</table>

**Min. Green:**

<table>
<thead>
<tr>
<th>Lanes</th>
<th>Y+R:</th>
<th>3 7</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>4.0</td>
<td>4.0</td>
</tr>
<tr>
<td>2</td>
<td>4.0</td>
<td>4.0</td>
</tr>
<tr>
<td>3</td>
<td>4.0</td>
<td>4.0</td>
</tr>
<tr>
<td>4</td>
<td>4.0</td>
<td>4.0</td>
</tr>
</tbody>
</table>

**Saturation Flow Module:**

<table>
<thead>
<tr>
<th>Sat/Lane:</th>
<th>1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adjustment:</td>
<td>0.92 0.92 0.92 0.92 0.92 0.92 0.92 0.92 0.92 0.92 0.92 0.92</td>
</tr>
<tr>
<td>Lanes:</td>
<td>1.00 2.89 0.11 1.00 2.60 0.40 1.00 0.34 0.66 1.00 1.00 1.00</td>
</tr>
<tr>
<td>Final Sat.:</td>
<td>1750 5488 195 1750 4949 692 1750 637 1164 1750 1900 1750</td>
</tr>
</tbody>
</table>

**Capacity Analysis Module:**

| Vol/Sat: | 0.06 0.29 0.29 0.05 0.22 0.22 0.02 0.05 0.05 0.04 0.04 0.04 |
| Crit Moves: | **** **** **** **** |
| Green Time: | 23.7 95.1 95.1 15.8 87.2 87.2 11.2 14.8 14.8 12.3 15.9 15.9 |
| Volume/Cap: | 0.38 0.46 0.46 0.46 0.38 0.38 0.28 0.46 0.46 0.46 0.37 0.39 |
| Uniform Del: | 56.6 14.2 14.2 63.1 16.9 16.9 65.6 63.8 63.8 65.7 62.3 62.5 |
| IncrementDel: | 0.9 0.1 0.1 1.8 0.1 0.1 1.2 1.9 1.9 2.3 1.1 1.3 |
| InitQueueDel: | 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 |
| Delay Adj: | 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 |
| Delay/Veh: | 57.5 14.3 14.3 64.9 16.9 16.9 66.8 65.7 65.7 68.0 63.5 63.8 |
| User Del/Veh: | 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 |
| AdjDel/Veh: | 57.5 14.3 14.3 64.9 16.9 16.9 66.8 65.7 65.7 68.0 63.5 63.8 |
| LOS by Move: | E+ B B E B B E E E E E |
| HCM2kAvgQ: | 5 13 13 4 10 10 2 4 4 4 3 4 |

Note: Queue reported is the number of cars per lane.
Level Of Service Computation Report
2000 HCM Operations (Future Volume Alternative)
Background AM

Intersection #9: El Camino Real & Page Mill Rd

Street Name: El Camino Real                   Page Mill Rd
Approach: North Bound  South Bound  East Bound  West Bound
Movement: L - T - R  L - T - R  L - T - R  L - T - R

Min. Green:  7 30 0  7 30 0  7 28 28  7 30 0
Y+R: 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0

Vol/Cnt Date: n/a  Cycle Time (sec): 125  Loss Time (sec): 1

Critical V/C: 0.858  Critical V/C: 1.131

Avg Crit Del (sec/veh): 76.6  Avg Delay (sec/veh): 64.3

LOS: E

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Note: Queue reported is the number of cars per lane.
Level Of Service Computation Report
2000 HCM Operations (Future Volume Alternative)
Background+Project AM

Intersection #9: El Camino Real & Page Mill Rd

Signal=Protect/Rights=Include
Final Vol: 278
Lanes: 1 0 3
Vol Cnt Date: n/a
Cycle Time (sec): 125
Loss Time (sec): 1
Critical V/C: 0.857
Avg Crit Del (sec/veh): 76.4
Avg Delay (sec/veh): 64.6

Signal=Protect
Final Vol: 501
Lanes: 2
Vol Cnt Date: n/a
Cycle Time (sec): 12
Loss Time (sec): 1
Critical V/C: 1.135
Avg Crit Del (sec/veh): 1135
Avg Delay (sec/veh): 270

Critical V/C: 0.857

LOS: E

Street Name:          El Camino Real                     Page Mill Rd
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Min. Green:     7   30     0     7   30     0     7   28    28     7   30     0
Y+R:          4.0  4.0   4.0   4.0  4.0   4.0   4.0  4.0   4.0   4.0  4.0   4.0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:     474 1275   116   333  494   262   484  884   147   259 1113   247
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:  474 1275   116   333  494   262   484  884   147   259 1113   247
Added Vol:      0    7     0     6    0     0     2    2     0     7    4     0
PasserByVol:   22   71    11    28   33    16    15   29     9     4   18     2
Initial Fut:  496 1353   127   367  527   278   501  915   156   270 1135   249
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Volume:   496 1353   127   367  527   278   501  915   156   270 1135   249
Reduced Vol:  496 1353   127   367  527   278   501  915   156   270 1135   249
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:  496 1353   127   367  527   278   501  915   156   270 1135   249

Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  0.83 1.00  0.97  0.83 1.00  0.97  0.83 1.00  0.92  0.69 1.00  0.97
Lanes:       2.00 2.74  0.26  2.00 3.00  1.00  2.00 2.00  1.00  2.00 1.63  0.37
Final Sat.:  3150 5198   488  3150 5700  1847  3150 3800  1750  2625 3100   680

Vol/Sat:     0.16 0.26  0.12  0.09 0.15  0.16 0.24  0.09  0.10 0.37  0.37
Crit Moves:  ****  ****  ****  ****
Green Time:  19.1 33.9  33.9 15.2 30.0  30.0 19.3 44.7  44.7 19.1 44.5 44.5
Volume/Cap:  1.03 0.96  0.96 0.39 0.63  1.03 0.67  0.25  0.67 1.03  1.03
Uniform Del: 52.9 44.8  44.8 54.6 39.8  42.5 52.8 33.9  28.3 50.0 40.2 40.2
IncremmtDel: 48.3 14.9  14.9 36.6 0.8  6.6 48.1 2.7  1.0 8.7 32.0 32.0
InitQueuDel:  0.0  0.0   0.0   0.0  0.0   0.0  0.0  0.0   0.0  0.0   0.0  0.0
Delay Adj:   1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Delay/Veh:  101.2 59.8  59.8 91.2 40.6  49.1 100.9 36.6  29.2 58.7 72.2 72.2
User DelAdj: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh:  101.2 59.8  59.8 91.2 40.6  49.1 100.9 36.6  29.2 58.7 72.2 72.2
LOS by Move:    F   E+    E+     F    D     D     F   D+     C    E+    E     E
HCM2kAvgQ:     17   24    25    12    6  11  17  15    4    7  35    36

Note: Queue reported is the number of cars per lane.
Level Of Service Computation Report
2000 HCM Operations (Future Volume Alternative)
Background AM

Intersection #10: PAGEMILL-OREGON EXPWY/MIDDLEFIELD RD

Approach: North Bound South Bound East Bound West Bound

Movement: L - T - R L - T - R L - T - R L - T - R

Min. Green: 7 10 10 7 10 10 7 10 10
Y+R: 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0

Volume Module:

Base Vol: 192 324 113 51 366 127 144 863 157 135 1308 23
Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse: 192 324 113 51 366 127 144 863 157 135 1308 23
Added Vol: 0 0 0 0 0 0 0 0 0 0 0 0
PasserByVol: 1 1 0 3 20 7 0 4 0 0 0 0
Initial Fut: 193 325 113 54 386 134 144 867 157 135 1348 23
User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Volume: 193 325 113 54 386 134 144 867 157 135 1348 23
Reduced Vol: 193 325 113 54 386 134 144 867 157 135 1348 23
PCE Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Final Volume: 193 325 113 54 386 134 144 867 157 135 1348 23

Saturation Flow Module:

Sat/Lane: 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900
Adjustment: 0.92 1.00 0.92 0.92 1.00 0.92 0.92 1.00 0.92 0.92 1.00 0.92
Lanes: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Final Sat.: 1750 1900 1750 1750 2760 958 1750 3800 1750 1750 3800 1750

Capacity Analysis Module:

Vol/Sat: 0.11 0.17 0.06 0.03 0.14 0.14 0.08 0.23 0.09 0.08 0.35 0.01
Crit Moves: **** **** **** ****

Note: Queue reported is the number of cars per lane.
### Level Of Service Computation Report

**2000 HCM Operations (Future Volume Alternative)**

**Background+Project AM**

---

**Intersection #10: PAGEMILL-OREGON EXPWY/MIDDLEFIELD RD**

<table>
<thead>
<tr>
<th>Signal=Protect</th>
<th>Rights=Overlap</th>
<th>Final Vol</th>
<th>Lanes:</th>
</tr>
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<tr>
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<td>137</td>
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<tr>
<td></td>
<td></td>
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<td>1 0 1 1</td>
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<td></td>
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<td>54</td>
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**Approach: North Bound**

<table>
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<tr>
<th>Movement</th>
<th>L - T - R</th>
<th>L - T - R</th>
<th>L - T - R</th>
<th>L - T - R</th>
</tr>
</thead>
<tbody>
<tr>
<td>Min. Green</td>
<td>7 10 10</td>
<td>7 10 7 10</td>
<td>7 7 10 10</td>
<td>7 10 10</td>
</tr>
<tr>
<td>Y+R</td>
<td>4.0 4.0</td>
<td>4.0 4.0</td>
<td>4.0 4.0</td>
<td>4.0 4.0</td>
</tr>
</tbody>
</table>

**Volume Module:**

- **Base Vol:** 192 324 113 51 366 127 144 863 157 135 1308 23
- **Growth Adj:** 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
- **Initial Bse:** 192 324 113 51 366 127 144 863 157 135 1308 23
- **Added Vol:** 3 0 0 0 0 3 3 7 3 0 7 0
- **PasserByVol:** 1 1 0 3 20 7 0 4 0 0 40 0
- **Initial Fut:** 196 325 113 54 386 137 147 874 160 135 1355 23
- **User Adj:** 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
- **PHF Adj:** 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
- **PHF Volume:** 196 325 113 54 386 137 147 874 160 135 1355 23
- **Reduct Vol:** 196 325 113 54 386 137 147 874 160 135 1355 23
- **PCE Adj:** 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
- **MLF Adj:** 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
- **FinalVolume:** 196 325 113 54 386 137 147 874 160 135 1355 23

**Saturation Flow Module:**

- **Sat/Lane:** 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900
- **Adjustment:** 0.92 1.00 0.92 1.00 0.92 1.00 0.92 1.00 0.92 0.92 1.00 0.92
- **Lanes:** 1.00 1.00 1.00 1.44 0.56 1.00 2.00 1.00 1.00 2.00 1.00 2.00
- **Final Sat:** 1750 1900 1750 2743 974 1750 3800 1750 1750 3800 1750 1750

**Capacity Analysis Module:**

- **Vol/Sat:** 0.11 0.17 0.06 0.03 0.14 0.14 0.08 0.23 0.09 0.08 0.36 0.01
- **Crit Moves:** **** **** **** ****
- **Green Time:** 22.3 39.5 61.5 10.8 28.0 44.7 16.7 65.7 65.7 22.0 71.0 71.0
- **Volume/Cap:** 0.75 0.65 0.16 0.43 0.75 0.47 0.75 0.53 0.21 0.53 0.75 0.03
- **Uniform Del:** 61.2 49.1 27.9 66.7 57.7 43.0 64.6 30.8 26.1 59.2 32.4 21.1
- **IncremntDel:** 11.8 3.0 0.1 2.3 4.7 0.3 15.3 0.3 0.1 2.0 1.9 0.0
- **InitQueuDel:** 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0
- **Delay Adj:** 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
- **Delay/Veh:** 73.0 52.1 28.0 69.0 62.4 43.3 85.3 47.1 39.8 67.9 53.6 33.7
- **LOS by Move:** E D- C E D F D D E D- C-
- **HCM2kAvgQ:** 14 14 3 3 13 10 9 18 7 7 30 1

Note: Queue reported is the number of cars per lane.
Level Of Service Computation Report
2000 HCM Unsignalized (Future Volume Alternative)
Background PM

Intersection #1: Park Blvd & Sherman Ave

Street Name: Park Blvd
Approach: North Bound
Movement: L - T - R
Volume Module:
Base Vol: 26 103 4 4 256 6 14 2 99 3 2 1
Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse: 26 103 4 4 256 6 14 2 99 3 2 1
Added Vol: 0 0 0 0 0 0 0 0 0 0 0 0
PasserByVol: 0 0 0 0 1 0 0 0 19 0 0 0
Initial Fut: 26 103 4 4 256 6 14 2 118 3 2 1
User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Volume: 26 103 4 4 257 6 14 2 118 3 2 1
Reduct Vol: 0 0 0 0 0 0 0 0 0 0 0 0
Final Volume: 26 103 4 4 257 6 14 2 118 3 2 1

Critical Gap Module:
Critical Gp: 4.1 xxxx xxxx 4.1 xxxx xxxx 7.1 6.5 6.2 7.1 6.5 6.2
FollowUpTim: 2.2 xxxx xxxx 2.2 xxxx xxxx 3.5 4.0 3.3 3.5 4.0 3.3

Capacity Module:
Conflict Vol.: 263 xxxx xxxx 107 xxxx xxxx 427 427 260 485 428 105
Potent Cap.: 1313 xxxx xxxx 1497 xxxx xxxx 542 523 784 496 522 955
Move Cap.: 1313 xxxx xxxx 1497 xxxx xxxx 530 511 784 412 510 955
Volume/Cap: 0.02 xxxx xxxx 0.00 xxxx xxxx 0.03 0.00 0.15 0.01 0.00 0.00

LOS by Move:

Movement: LT - LTR - RT LT - LTR - RT LT - LTR - RT LT - LTR - RT
Shared Cap.: 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00
Shared Queue: 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00
Shared LOS: * * * * * * * * * * * *
Approach Del: 10.9 12.4
Approach LOS: B B

Note: Queue reported is the number of cars per lane.

Future Volume Alternative: Peak Hour Warrant NOT Met

Peak Hour Delay Signal Warrant Report

Intersection #1 Park Blvd & Sherman Ave

Future Volume Alternative: Peak Hour Warrant NOT Met
**Approach: North Bound | South Bound | East Bound | West Bound**

**Movement:**

<table>
<thead>
<tr>
<th>North Bound</th>
<th>South Bound</th>
<th>East Bound</th>
<th>West Bound</th>
</tr>
</thead>
<tbody>
<tr>
<td>L - T - R</td>
<td>L - T - R</td>
<td>L - T - R</td>
<td>L - T - R</td>
</tr>
</tbody>
</table>

**Control:**

<table>
<thead>
<tr>
<th>North Bound</th>
<th>South Bound</th>
<th>East Bound</th>
<th>West Bound</th>
</tr>
</thead>
<tbody>
<tr>
<td>Uncontrolled</td>
<td>Uncontrolled</td>
<td>Stop Sign</td>
<td>Stop Sign</td>
</tr>
</tbody>
</table>

**Initial Vol:**

<table>
<thead>
<tr>
<th>North Bound</th>
<th>South Bound</th>
<th>East Bound</th>
<th>West Bound</th>
</tr>
</thead>
<tbody>
<tr>
<td>26 103 4</td>
<td>4 257 6</td>
<td>14 2 118 3</td>
<td>3 2 1</td>
</tr>
</tbody>
</table>

**Approach Del:**

<table>
<thead>
<tr>
<th>North Bound</th>
<th>South Bound</th>
<th>East Bound</th>
<th>West Bound</th>
</tr>
</thead>
<tbody>
<tr>
<td>xxxxxx</td>
<td>xxxxxx</td>
<td>10.9</td>
<td>12.4</td>
</tr>
</tbody>
</table>

**Approach [eastbound][lanes=1][control=Stop Sign]**

**Signal Warrant Rule #1:** [vehicle-hours=0.4]

FAIL - Vehicle-hours less than 4 for one lane approach.

**Signal Warrant Rule #2:** [approach volume=134]

SUCCEED - Approach volume greater than or equal to 100 for one lane approach.

**Signal Warrant Rule #3:** [approach count=4][total volume=540]

FAIL - Total volume less than 650 for intersection with less than four approaches.

**Approach [westbound][lanes=1][control=Stop Sign]**

**Signal Warrant Rule #1:** [vehicle-hours=0.0]

FAIL - Vehicle-hours less than 4 for one lane approach.

**Signal Warrant Rule #2:** [approach volume=6]

FAIL - Approach volume less than 100 for one lane approach.

**Signal Warrant Rule #3:** [approach count=4][total volume=540]

FAIL - Total volume less than 650 for intersection with less than four approaches.

**SIGNAL WARRANT DISCLAIMER**

This peak hour signal warrant analysis should be considered solely as an "indicator" of the likelihood of an unsignalized intersection warranting a traffic signal in the future. Intersections that exceed this warrant are probably more likely to meet one or more of the other volume based signal warrant (such as the 4-hour or 8-hour warrants).

The peak hour warrant analysis in this report is not intended to replace a rigorous and complete traffic signal warrant analysis by the responsible jurisdiction. Consideration of the other signal warrants, which is beyond the scope of this software, may yield different results.

**Intersection #1 Park Blvd & Sherman Ave**

**Future Volume Alternative:** Peak Hour Warrant NOT Met

**Approach: North Bound | South Bound | East Bound | West Bound**

**Movement:**

<table>
<thead>
<tr>
<th>North Bound</th>
<th>South Bound</th>
<th>East Bound</th>
<th>West Bound</th>
</tr>
</thead>
<tbody>
<tr>
<td>L - T - R</td>
<td>L - T - R</td>
<td>L - T - R</td>
<td>L - T - R</td>
</tr>
</tbody>
</table>

**Control:**

<table>
<thead>
<tr>
<th>North Bound</th>
<th>South Bound</th>
<th>East Bound</th>
<th>West Bound</th>
</tr>
</thead>
<tbody>
<tr>
<td>Uncontrolled</td>
<td>Uncontrolled</td>
<td>Stop Sign</td>
<td>Stop Sign</td>
</tr>
</tbody>
</table>

**Initial Vol:**

<table>
<thead>
<tr>
<th>North Bound</th>
<th>South Bound</th>
<th>East Bound</th>
<th>West Bound</th>
</tr>
</thead>
<tbody>
<tr>
<td>26 103 4</td>
<td>4 257 6</td>
<td>14 2 118 3</td>
<td>3 2 1</td>
</tr>
</tbody>
</table>

**Major Street Volume:**

| Major Street Volume: | 400 |

**Minor Approach Volume:**

| Minor Approach Volume: | 134 |

**Minor Approach Volume Threshold:** 464

**SIGNAL WARRANT DISCLAIMER**

This peak hour signal warrant analysis should be considered solely as an "indicator" of the likelihood of an unsignalized intersection warranting a traffic signal in the future. Intersections that exceed this warrant are probably more likely to meet one or more of the other volume based signal warrant (such as the 4-hour or 8-hour warrants).

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Intersection #1: Park Blvd & Sherman Ave

Signal=Uncontrol/Rights=Include

Final Vol: 23
Lanes: 0 0 1 0 0

Signal=Stop

Final Vol: 32
Lanes: 0 0 1 0 0

Street Name: Park Blvd
Approach: North Bound
Movement: L - T - R
Volume Module:
Base Vol: 26 103 4 4 256 6 14 2 99 3 2 1
Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse: 26 103 4 4 256 6 14 2 99 3 2 1
Added Vol: 19 0 0 0 0 17 18 0 33 0 0 0
PasserByVol: 0 0 0 0 1 0 0 0 19 0 0 0
Initial Fut: 45 103 4 4 257 23 32 2 151 3 2 1
User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Volume: 45 103 4 4 257 23 32 2 151 3 2 1
Reduct Vol: 0 0 0 0 0 0 0 0 0 0 0 0
FinalVolume: 45 103 4 4 257 23 32 2 151 3 2 1

Critical Gap Module:
Critical Gp: 4.1 xxxx xxxx 4.1 xxxx xxxx 7.1 6.5 6.2 7.1 6.5 6.2
FollowUpTim: 2.2 xxxx xxxx 2.2 xxxx xxxx 3.5 4.0 3.3 3.5 4.0 3.3

Capacity Module:
Cnflict Vol: 280 xxxx xxxx 107 xxxx xxxx 473 474 269 548 483 105
Potent Cap.: 1294 xxxx xxxx 1497 xxxx xxxx 505 492 775 450 486 955
Move Cap.: 1294 xxxx xxxx 1497 xxxx xxxx 488 473 775 351 468 955
Volume/Cap: 0.03 xxxx xxxx 0.00 xxxx xxxx 0.07 0.00 0.19 0.01 0.00 0.00

Level Of Service Module:
2Way95thQ: 0.1 xxxx xxxx 0.0 xxxx xxxx xxxx xxxx xxxx xxxx xxxx xxxx xxxx
Control Del: 7.9 xxxx xxxx 7.4 xxxx xxxx xxxx xxxx xxxx xxxx xxxx xxxx xxxx
LOS by Move: A * * A * * * * * * * *
Movement: LT - LTR - RT LT - LTR - RT LT - LTR - RT LT - LTR - RT
Shared Cap.: xxxx xxxx xxxx xxxx xxxx xxxx xxxx xxxx xxxx 699 xxxx xxxx 432 xxxx
SharedQueue:xxxxxx xxxx xxxx xxxx xxxx xxxx xxxx 1.1 xxxx xxxx 0.0 xxxx
Shrd ConDel:xxxxxx xxxx xxxx xxxx xxxx xxxx xxxx 12.0 xxxx xxxx 13.4 xxxx
Shared LOS: * * * * * * B * B *
ApproachDel: xxxxxx xxxxxx 12.0 13.4
ApproachLOS: * B B

Note: Queue reported is the number of cars per lane.

Peak Hour Delay Signal Warrant Report

Intersection #1 Park Blvd & Sherman Ave

Future Volume Alternative: Peak Hour Warrant NOT Met
Approach: | North Bound | South Bound | East Bound | West Bound
Movement: | L - T - R | L - T - R | L - T - R | L - T - R
Control: | Uncontrolled | Uncontrolled | Stop Sign | Stop Sign
Lanes: 0 0 1! 0 0 0 0 1! 0 0 0 0 1! 0 0 0 0 1! 0 0
Initial Vol: 45 103 4 4 257 23 32 2 151 3 2 1
Approach Del: xxxxxx xxxxxx 12.0 13.4

Approach[eastbound][lanes=1][control=Stop Sign]
Signal Warrant Rule #1: [vehicle-hours=0.6]
FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=185]
FAIL - Approach volume greater than or equal to 100 for one lane approach.
Signal Warrant Rule #3: [approach count=4][total volume=627]
FAIL - Total volume less than 650 for intersection with less than four approaches.

Approach[westbound][lanes=1][control=Stop Sign]
Signal Warrant Rule #1: [vehicle-hours=0.0]
FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=6]
FAIL - Approach volume greater than or equal to 100 for one lane approach.
Signal Warrant Rule #3: [approach count=4][total volume=627]
FAIL - Total volume less than 650 for intersection with less than four approaches.

SIGNAL WARRANT DISCLAIMER
This peak hour signal warrant analysis should be considered solely as an "indicator" of the likelihood of an unsignalized intersection warranting a traffic signal in the future. Intersections that exceed this warrant are probably more likely to meet one or more of the other volume based signal warrant (such as the 4-hour or 8-hour warrants).

The peak hour warrant analysis in this report is not intended to replace a rigorous and complete traffic signal warrant analysis by the responsible jurisdiction. Consideration of the other signal warrants, which is beyond the scope of this software, may yield different results.
# Level Of Service Computation Report

## 2000 HCM Operations (Future Volume Alternative)

**Background PM**

### Intersection #2: Park Blvd & Page Mill Rd

<table>
<thead>
<tr>
<th>Signal=Split/Rights=Overlap</th>
<th>Final Vol: 418***</th>
<th>Lanes: 1 0 0 1 0</th>
</tr>
</thead>
<tbody>
<tr>
<td>Final Vol: Lanes: Signal=Protect Rights=Include</td>
<td>220 0 1 0 0</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Final Vol: Lanes: Signal=Protect Rights=Include</th>
<th>Vol Cnt Date: n/a</th>
<th>Cycle Time (sec): 80</th>
</tr>
</thead>
<tbody>
<tr>
<td>Final Vol: Lanes: Signal=Protect Rights=Include</td>
<td>Loss Time (sec): 12</td>
<td></td>
</tr>
</tbody>
</table>

**Street Name:** Park Blvd

**Approach:** North Bound

**Movement:**

<table>
<thead>
<tr>
<th>Min. Green:</th>
<th>Y+R:</th>
</tr>
</thead>
<tbody>
<tr>
<td>7 10 10 10 7 10 10 7 10 10</td>
<td>4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0</td>
</tr>
</tbody>
</table>

**Volume Module:**

<table>
<thead>
<tr>
<th>Base Vol: 104 120</th>
<th>Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initial Bse: 104 120</td>
<td>Added Vol: 0 0 0 0 0 0 0 0 0 0 0 0</td>
</tr>
<tr>
<td>PasserByVol: 32 12</td>
<td>Initial Fut: 136 132 1</td>
</tr>
<tr>
<td>User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00</td>
<td></td>
</tr>
<tr>
<td>PHF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00</td>
<td></td>
</tr>
<tr>
<td>PHF Volume: 136 132 1</td>
<td></td>
</tr>
<tr>
<td>Reduced Vol: 136 132 1</td>
<td></td>
</tr>
<tr>
<td>PCE Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00</td>
<td></td>
</tr>
<tr>
<td>FinalVolume: 136 132 1</td>
<td></td>
</tr>
</tbody>
</table>

**Saturation Flow Module:**

| Sat/Lane: 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 |
|------------------|-------------------------------------------------|
| Adjustment: 0.90 0.97 0.90 0.92 1.00 0.52 0.88 0.89 0.76 0.88 0.92 0.64 |
| Lanes: 0.52 0.47 0.01 0.02 0.98 1.00 0.24 0.76 0.10 0.38 0.62 |
| Final Sat.: 897 870 7 |

**Capacity Analysis Module:**

| Vol/Sat: 0.15 0.15 0.15 0.12 0.12 0.42 0.02 0.02 0.02 0.00 0.04 0.04 |
|------------------|-------------------------------------------------|
| Crit Moves: **** ***** **** |
| Green Time: 15.9 15.9 15.9 35.1 35.1 42.1 7.0 10.0 10.0 7.0 10.0 10.0 |
| Volume/Cap: 0.76 0.76 0.76 0.27 0.27 0.80 0.25 0.16 0.16 0.05 0.29 0.29 |
| Uniform Del: 30.2 30.2 30.2 14.3 14.3 14.3 15.5 34.1 31.2 31.2 33.5 31.8 31.8 |
| IncremntDel: 9.3 9.3 9.3 0.2 0.2 8.6 0.9 0.4 0.4 0.2 0.9 0.9 |
| InitQueueDel: 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 |
| Delay Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 |
| Delay/Veh: 39.6 39.6 39.6 14.5 14.5 24.2 35.0 31.6 31.6 33.6 32.7 32.7 |
| User DelAdj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 |
| AdjDel/Veh: 39.6 39.6 39.6 14.5 14.5 24.2 35.0 31.6 31.6 33.6 32.7 32.7 |
| LOS by Move: D D D B B C C- C C- C- C- |
| HCM2kAvgQ: 8 8 8 4 4 12 1 1 1 0 2 1 |

**Note:** Queue reported is the number of cars per lane.
Intersection #2: Park Blvd & Page Mill Rd

Final Vol: 436
Lanes: 1 0 0

Final Vol: 220
Lanes: 0 1 0

Final Vol: 39
Lanes: 0 0 1

Final Vol: 27
Lanes: 0 0 1

Final Vol: 0
Lanes: 0 0 1

Street Name: Park Blvd                        Page Mill Rd
Approach: North Bound      South Bound       East Bound       West Bound
Movement: L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R

Min. Green: 7 10 10 7 10 10 7 10 10 7 10 10
Y+R: 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0

Volume Module:
Base Vol: 104 120 0 0 0 0 0 0 0 0 0 0
Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse: 104 120 0 0 0 0 0 0 0 0 0 0
Added Vol: 0 0 0 0 0 0 0 0 0 0 0 0
PasserByVol: 32 12 1 4 6 46 5 5 1 3 20 22
Initial Fut: 136 132 1 4 220 436 39 8 22 8 24 27
User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Volume: 136 132 1 4 220 436 39 8 22 8 24 27
Reduced Vol: 0 0 0 0 0 0 0 0 0 0 0 0
PCE Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
FinalVolume: 136 132 1 4 220 436 39 8 22 8 24 27

Saturation Flow Module:
Sat/Lane: 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900
Adjustment: 0.90 0.97 0.90 0.92 1.00 0.52 0.88 0.89 0.76 0.88 0.92 0.64
Lanes: 0.52 0.47 0.01 0.02 0.98 1.00 1.00 0.24 0.76 1.00 0.38 0.62
Final Sat.: 897 870 7 34 1861 993 1663 401 1102 1663 668 752

Capacity Analysis Module:
Vol/Sat: 0.15 0.15 0.15 0.12 0.12 0.44 0.02 0.02 0.02 0.00 0.04 0.04
Crit Moves: **** **** **** ****
Green Time: 15.4 15.4 15.4 35.6 35.6 42.6 7.0 10.0 10.0 7.0 10.0 10.0
Volume/Cap: 0.79 0.79 0.79 0.27 0.27 0.82 0.27 0.16 0.16 0.05 0.29 0.29
Uniform Del: 30.8 30.8 30.8 14.0 14.0 15.6 34.1 31.2 31.2 33.5 31.8 31.8
IncremmtDel: 11.7 11.7 11.7 0.2 0.2 10.2 1.0 0.4 0.4 0.2 0.9 0.9
InitQueuDel: 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0
Delay Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Delay/Veh: 42.5 42.5 42.5 14.1 14.1 25.7 35.1 31.6 31.6 33.6 32.7 32.7
User DelAdj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
AdjDel/Veh: 42.5 42.5 42.5 14.1 14.1 25.7 35.1 31.6 31.6 33.6 32.7 32.7
LOS by Move: D  D  D  B  B  C  D  C  C  C  C  C
HCM2kAvgQ: 9 9 9 3 3 12 1 1 1 0 2 1
Note: Queue reported is the number of cars per lane.
Intersection #3: Birch St & Sherman Ave

Street Name: Birch St
Approach: North Bound
Movement: L - T - R
Min. Green: 7 10 10
Volume Module:
Base Vol: 53 182 28 37 54 9 13 81 16 12 29 10
Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse: 53 182 28 37 54 9 13 81 16 12 29 10
Added Vol: 0 0 0 0 0 0 0 0 0 0 0 0
PasserByVol: 5 0 0 0 0 0 0 0 0 0 0 0
Initial Fut: 58 182 28 37 54 9 13 100 16 12 29 10
User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Volume: 58 182 28 37 54 9 13 100 16 12 29 10
Reduct Vol: 0 0 0 0 0 0 0 0 0 0 0 0
Reduced Vol: 58 182 28 37 54 9 13 100 16 12 29 10
PCE Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
MLF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
FinalVolume: 58 182 28 37 54 9 13 100 16 12 29 10

Saturation Flow Module:
Adjustment: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Lanes: 0.43 1.36 0.21 0.74 1.08 0.18 0.10 0.78 0.12 0.23 0.57 0.20
Final Sat.: 290 948 150 464 725 123 72 556 89 164 396 136

Capacity Analysis Module:
Vol/Sat: 0.20 0.19 0.19 0.08 0.07 0.07 0.18 0.18 0.18 0.07 0.07 0.07
Crit Moves: **** **** **** ****
Delay/Veh: 9.2 8.9 8.7 8.7 8.3 8.1 8.8 8.8 8.8 8.2 8.2 8.2
Delay Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
AdjDel/Veh: 9.2 8.9 8.7 8.7 8.3 8.1 8.8 8.8 8.8 8.2 8.2 8.2
LOS by Move: A A A A A A A A A A A A
ApproachDel: 8.9 8.4 8.8 8.2
Delay Adj: 1.00 1.00 1.00 1.00
ApprAdjDel: 8.9 8.4 8.8 8.2
LOS by Appr: A A A A
AllWayAvgQ: 0.2 0.2 0.1 0.1 0.2 0.2 0.2 0.1 0.1 0.1
Note: Queue reported is the number of cars per lane.

Peak Hour Volume Signal Warrant Report [Urban]

Intersection #3 Birch St & Sherman Ave
Future Volume Alternative: Peak Hour Warrant NOT Met

Approach:   | North Bound     | South Bound     | East Bound     | West Bound     |
Movement:   | L - T - R       | L - T - R       | L - T - R      | L - T - R      |
Control:    | Stop Sign       | Stop Sign       | Stop Sign      | Stop Sign      |
Lanes:      | 0 1 0 1 0       | 0 1 0 1 0       | 0 0 1! 0 0     | 0 0 1! 0 0     |
Initial Vol:| 58 182 28       | 37 54 9         | 13 100 16      | 12 29 10       |

Major Street Volume: 368
Minor Approach Volume: 129
Minor Approach Volume Threshold: 629

SIGNAL WARRANT DISCLAIMER
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### Intersection #3: Birch St & Sherman Ave

**Level Of Service Computation Report**

**2000 HCM 4-Way Stop (Future Volume Alternative)**

**Background+Project PM**

**Final Vol:**

<table>
<thead>
<tr>
<th>Lane</th>
<th>Lanes</th>
<th>Signal=Stop Rights=Include</th>
<th>Vol Cnt</th>
<th>Date</th>
<th>Signal=Stop Rights=Include</th>
<th>Lanes</th>
<th>Final Vol</th>
</tr>
</thead>
<tbody>
<tr>
<td>26</td>
<td>0</td>
<td>1</td>
<td>64</td>
<td></td>
<td>54***</td>
<td>0</td>
<td>19</td>
</tr>
<tr>
<td>34</td>
<td>0</td>
<td>1</td>
<td></td>
<td></td>
<td>143***</td>
<td>1</td>
<td>64***</td>
</tr>
<tr>
<td>25</td>
<td>0</td>
<td>1</td>
<td></td>
<td></td>
<td>25</td>
<td>0</td>
<td>19</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Street Name:**

<table>
<thead>
<tr>
<th>Street</th>
<th>North Bound</th>
<th>South Bound</th>
<th>East Bound</th>
<th>West Bound</th>
</tr>
</thead>
<tbody>
<tr>
<td>Birch St</td>
<td>53 128 28 37 54 9</td>
<td>13 81 16 12 29 10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sherman Ave</td>
<td>53 182 28 37 54 9</td>
<td>13 81 16 12 29 10</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Movement:**

<table>
<thead>
<tr>
<th>Movement</th>
<th>L - T - R</th>
<th>L - T - R</th>
<th>L - T - R</th>
<th>L - T - R</th>
</tr>
</thead>
<tbody>
<tr>
<td>Min. Green</td>
<td>7 10 10</td>
<td>7 10 10</td>
<td>7 10 10</td>
<td>7 10 10</td>
</tr>
</tbody>
</table>

**Volume Module:**

<table>
<thead>
<tr>
<th>Base Vol</th>
<th>Growth Adj</th>
<th>Initial Bse</th>
<th>Added Vol</th>
<th>PasserByVol</th>
<th>Initial Fut</th>
<th>User Adj</th>
<th>PHF Adj</th>
<th>PHF Volume</th>
<th>Reduct Vol</th>
<th>Reduced Vol</th>
<th>PCE Adj</th>
<th>MLF Adj</th>
<th>Final Volume</th>
</tr>
</thead>
<tbody>
<tr>
<td>53 182 28 37 54 9</td>
<td>1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00</td>
<td>53 182 28 37 54 9</td>
<td>0 6 20 17 10 17 21 43 9 7 35 8</td>
<td>5 0 0 0 0 0 0 0 0 0 0 0</td>
<td>58 188 48 54 64 26 34 143 25 19 64 18</td>
<td>1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00</td>
<td>1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00</td>
<td>58 188 48 54 64 26 34 143 25 19 64 18</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tbody>
</table>

**Saturation Flow Module:**

<table>
<thead>
<tr>
<th>Lanes</th>
<th>Final Sat.</th>
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</thead>
<tbody>
<tr>
<td>0.39 1.28 0.33 0.75 0.89 0.36 0.17 0.71 0.12 0.19 0.63 0.18</td>
<td>243 820 217 430 551 230 113 477 83 122 410 115</td>
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</tbody>
</table>

**Capacity Analysis Module:**

<table>
<thead>
<tr>
<th>Vol/Sat</th>
<th>Crit Moves</th>
<th>Delay/Veh</th>
<th>Delay Adj</th>
<th>AdjDel/Veh</th>
<th>LOS by Move</th>
<th>ApprAdjDel</th>
<th>LOS by Appr</th>
<th>AllWayAvgQ</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.24 0.23 0.22 0.13 0.12 0.11 0.30 0.30 0.30 0.16 0.16 0.16</td>
<td>****</td>
<td>10.0 9.6 9.3 9.5 8.9 8.7 10.1 10.1 10.1 9.1 9.1 9.1</td>
<td>1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00</td>
<td>10.0 9.6 9.3 9.5 8.9 8.7 10.1 10.1 10.1 9.1 9.1 9.1</td>
<td>B A A A A A A A A A A</td>
<td>9.7 9.1 10.1 9.1</td>
<td>9.7 9.1 10.1 9.1</td>
<td>0.3 0.3 0.1 0.1 0.4 0.4 0.2 0.2 0.2</td>
</tr>
</tbody>
</table>

**Peak Hour Volume Signal Warrant Report [Urban]**

---

**Intersection #3 Birch St & Sherman Ave**

---

*Note: Queue reported is the number of cars per lane.*
Future Volume Alternative: Peak Hour Warrant NOT Met

<table>
<thead>
<tr>
<th>Approach</th>
<th>North Bound</th>
<th>South Bound</th>
<th>East Bound</th>
<th>West Bound</th>
</tr>
</thead>
<tbody>
<tr>
<td>Movement</td>
<td>L - T - R</td>
<td>L - T - R</td>
<td>L - T - R</td>
<td>L - T - R</td>
</tr>
<tr>
<td>Control</td>
<td>Stop Sign</td>
<td>Stop Sign</td>
<td>Stop Sign</td>
<td>Stop Sign</td>
</tr>
<tr>
<td>Lanes</td>
<td>0 1 0 1 0</td>
<td>0 1 0 1 0</td>
<td>0 0 1! 0 0</td>
<td>0 0 1! 0 0</td>
</tr>
<tr>
<td>Initial Vol</td>
<td>58 188 48</td>
<td>54 64 26</td>
<td>34 143 25</td>
<td>19 64 18</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Major Street Volume</th>
<th>438</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minor Approach Volume</td>
<td>202</td>
</tr>
<tr>
<td>Minor Approach Volume Threshold</td>
<td>569</td>
</tr>
</tbody>
</table>

SIGNAL WARRANT DISCLAIMER

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Level Of Service Computation Report
2000 HCM Unsignalized (Future Volume Alternative)
Background PM

Intersection #4: Birch St & Grant Ave

Street Name: Birch St Grant Ave
Approach: North Bound South Bound East Bound West Bound
Movement: L - T - R L - T - R L - T - R L - T - R

Volume Module:
Base Vol: 13 277 21 8 66 15 22 33 10 0 0 0
Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse: 13 277 21 8 66 15 22 33 10 0 0 0
Added Vol: 0 0 0 0 0 0 0 0 0 0 0 0
PasserByVol: 3 5 1 0 0 0 0 8 0 0 0 0
Initial Fut: 16 282 22 8 66 15 22 41 10 0 0 0
User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Volume: 16 282 22 8 66 15 22 41 10 0 0 0
Reduct Vol: 0 0 0 0 0 0 0 0 0 0 0 0
FinalVolume: 16 282 22 8 66 15 22 41 10 0 0 0

Critical Gap Module:
Critical Gp: 4.1 xxxx xxxx xxxx 6.8 6.5 6.9 xxxx xxxx xxxx
FollowUpTim: 2.2 xxxx xxxx xxxx 3.5 4.0 3.3 xxxx xxxx xxxx

Capacity Module:
Cnflict Vol: 81 xxxx xxxx xxxx 263 426 41 xxxx xxxx xxxx
Potent Cap.: 1529 xxxx xxxx xxxx 710 524 1028 xxxx xxxx xxxx
Move Cap.: 1529 xxxx xxxx xxxx 701 515 1028 xxxx xxxx xxxx

Level Of Service Module:
2Way95thQ: 0.0 xxxx xxxx 0.0 xxxx xxxx xxxx xxxx xxxx xxxx
Control Del: 7.4 xxxx xxxx 7.9 xxxx xxxx xxxx xxxx xxxx xxxx
Movement: LT - LTR - RT LT - LTR - RT LT - LTR - RT LT - LTR - RT
Shared Cap.: xxxx xxxx xxxx xxxx xxxx xxxx xxxx 605 xxxx xxxx xxxx
SharedQueue: 0.0 0.0 0.0 0.0 0.4 xxxx xxxx xxxx
Shrd ConDel: 7.4 xxxx xxxx xxxx 11.8 xxxx xxxx xxxx xxxx
ApproachDel: xxxx xxxx 11.8 xxxx xxxx
ApproachLOS: B *

Note: Queue reported is the number of cars per lane.
Approach: North Bound | South Bound | East Bound | West Bound
Movement: L - T - R | L - T - R | L - T - R | L - T - R
-----------------|-----------------|-----------------|-----------------|-----------------
Control: Uncontrolled | Uncontrolled | Stop Sign | Stop Sign
Lanes: 0 1 0 1 0 0 1 0 1 0 0 0 0 0 0 0 0 0 22 8 66 15 22 41 10 0 0 0
Initial Vol: 16 282 22 8 66 15 22 41 10 0 0 0
Approach Del: xxxxxx

Signal Warrant Rule #1: [vehicle-hours=0.2]
FAIL - Vehicle-hours less than 4 for one lane approach.

Signal Warrant Rule #2: [approach volume=73]
FAIL - Approach volume less than 100 for one lane approach.

Signal Warrant Rule #3: [approach count=3][total volume=482]
FAIL - Total volume less than 650 for intersection with less than four approaches.

SIGNAL WARRANT DISCLAIMER
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Peak Hour Volume Signal Warrant Report [Urban]

Intersection #4 Birch St & Grant Ave

Future Volume Alternative: Peak Hour Warrant NOT Met

Approach: North Bound | South Bound | East Bound | West Bound
Movement: L - T - R | L - T - R | L - T - R | L - T - R
-----------------|-----------------|-----------------|-----------------|-----------------
Control: Uncontrolled | Uncontrolled | Stop Sign | Stop Sign
Lanes: 0 1 0 1 0 0 1 0 1 0 0 0 0 0 0 0 0 0 22 8 66 15 22 41 10 0 0 0
Major Street Volume: 409
Minor Approach Volume: 73
Minor Approach Volume Threshold: 593

SIGNAL WARRANT DISCLAIMER
This peak hour signal warrant analysis should be considered solely as an "indicator" of the likelihood of an unsignalized intersection warranting a traffic signal in the future. Intersections that exceed this warrant are probably more likely to meet one or more of the other volume based signal warrant (such as the 4-hour or 8-hour warrants).

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Intersection #4: Birch St & Grant Ave

Street Name: Birch St
Approach: North Bound
Movement: L - T - R
Volume Module:
Base Vol: 13 277 21 8 66 15 22 33 10 0 0 0
Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse: 13 277 21 8 66 15 22 33 10 0 0 0
Added Vol: 0 26 0 2 14 0 0 0 0 0 0 0
PasserByVol: 3 5 1 0 0 0 0 8 0 0 0 0
Initial Fut: 16 308 22 10 80 15 22 41 10 0 0 0
User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Volume: 16 308 22 10 80 15 22 41 10 0 0 0
Reduct Vol: 0 0 0 0 0 0 0 0 0 0 0 0
FinalVolume: 16 308 22 10 80 15 22 41 10 0 0 0

Critical Gap Module:
Critical Gp: 4.1 xxxx xxxx 4.1 xxxx xxxx 6.8 6.5 6.9 xxxx xxxx xxxx
FollowUpTim: 2.2 xxxx xxxx 2.2 xxxx xxxx 3.5 4.0 3.3 xxxx xxxx xxxx

Capacity Module:
Cnflict Vol: 95 xxxx xxxx 330 xxxx xxxx 294 470 48 xxxx xxxx xxxx
Potent Cap.: 1512 xxxx xxxx 1241 xxxx xxxx 679 495 1018 xxxx xxxx xxxx
Move Cap.: 1512 xxxx xxxx 1241 xxxx xxxx 669 485 1018 xxxx xxxx xxxx
Volume/Cap: 0.01 xxxx xxxx 0.01 xxxx xxxx 0.03 0.08 0.01 xxxx xxxx xxxx

Level Of Service Module:
2Way95thQ: 0.0 xxxx xxxx 0.0 xxxx xxxx xxxx xxxx xxxx xxxx xxxx xxxx xxxx
Control Del: 7.4 xxxx xxxx 7.9 xxxx xxxx xxxx xxxx xxxx xxxx xxxx xxxx xxxx
Movement: LT - LTR - RT LT - LTR - RT LT - LTR - RT LT - LTR - RT
Shared Cap.: xxxx xxxx xxxx xxxx xxxx xxxx xxxx xxxx 574 xxxx xxxx xxxx xxxx
SharedQueue: 0.0 xxxx xxxx 0.0 xxxx xxxx xxxx 0.4 xxxx xxxx xxxx xxxx
Shrd ConDel: 7.4 xxxx xxxx 7.9 xxxx xxxx xxxx 12.2 xxxx xxxx xxxx xxxx
Shared LOS: A * A * A B * B *
ApproachDel: xxxx xxxx 12.2 xxxx xxxx
ApproachLOS: *

Note: Queue reported is the number of cars per lane.

Peak Hour Delay Signal Warrant Report

Intersection #4 Birch St & Grant Ave
Future Volume Alternative: Peak Hour Warrant NOT Met
Approach: North Bound  South Bound  East Bound  West Bound
Movement:   L - T - R   L - T - R   L - T - R   L - T - R
-----------|---------------||---------------||---------------||---------------|
Control:   Uncontrolled  Uncontrolled  Stop Sign  Stop Sign
Lanes: 0 1 0 1 0 0 1 0 1 0 0 1 0 0 0 0 0 0
Initial Vol: 16 308 22 10 80 15 22 41 10 0 0 0 0
Approach Del: xxxxxx xxxxxx 12.2 xxxxxx
eba5a734324e55732e4e4e4e4e4e4e4e
Approach [eastbound] [lanes=1] [control=Stop Sign]
Signal Warrant Rule #1: [vehicle-hours=0.2]
   FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=73]
   FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=3][total volume=524]
   FAIL - Total volume less than 650 for intersection
   with less than four approaches.

SIGNAL WARRANT DISCLAIMER
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"indicator" of the likelihood of an unsignalized intersection warranting
a traffic signal in the future. Intersections that exceed this warrant
are probably more likely to meet one or more of the other volume based
signal warrant (such as the 4-hour or 8-hour warrants).

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a rigorous and complete traffic signal warrant analysis by the responsible
jurisdiction. Consideration of the other signal warrants, which is beyond
the scope of this software, may yield different results.

Peak Hour Volume Signal Warrant Report [Urban]

Intersection #4 Birch St & Grant Ave
Future Volume Alternative: Peak Hour Warrant NOT Met

Approach: North Bound  South Bound  East Bound  West Bound
Movement:   L - T - R   L - T - R   L - T - R   L - T - R
-----------|---------------||---------------||---------------||---------------|
Control:   Uncontrolled  Uncontrolled  Stop Sign  Stop Sign
Lanes: 0 1 0 1 0 0 1 0 1 0 0 1 0 0 0 0 0 0 0
Initial Vol: 16 308 22 10 80 15 22 41 10 0 0 0 0
Major Street Volume: 451
Minor Approach Volume: 73
Minor Approach Volume Threshold: 559

SIGNAL WARRANT DISCLAIMER
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"indicator" of the likelihood of an unsignalized intersection warranting
a traffic signal in the future. Intersections that exceed this warrant
are probably more likely to meet one or more of the other volume based
signal warrant (such as the 4-hour or 8-hour warrants).

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a rigorous and complete traffic signal warrant analysis by the responsible
jurisdiction. Consideration of the other signal warrants, which is beyond
the scope of this software, may yield different results.
**Level Of Service Computation Report**

*2000 HCM Unsignalized (Future Volume Alternative)*

**Background PM**

### Intersection #5: Birch St & Sheridan Ave

**Final Vol:**

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<thead>
<tr>
<th>Lanes:</th>
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<th>0</th>
<th>1</th>
<th>0</th>
<th>0</th>
<th>1</th>
<th>0</th>
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**Final Vol:**

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<tr>
<th>Lanes:</th>
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<th>0</th>
<th>1</th>
<th>0</th>
<th>0</th>
<th>1</th>
<th>0</th>
</tr>
</thead>
</table>

**Traffic Flow Parameters:**

- **Final Vol:** 6 57 24
- **Lanes:** 0 1 0 1 0
- **Cycle Time (sec):**
  - **Loss Time (sec):** 0
- **Critical Vol:** 0.313
- **Avg Crit Del (sec/veh):** 5.9
- **Avg Delay (sec/veh):** 5.9
- **LOS:** C

**Street Name:**

- **Birch St**
- **Sheridan Ave**

**Approach:**

- **North Bound**
  - L - T - R
- **South Bound**
  - L - T - R
- **East Bound**
  - L - T - R
- **West Bound**
  - L - T - R

**Volume Module:**

- **Base Vol:** 71 280 119 24 57 6 1 29 1 67 24 7
- **Growth Adj:** 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
- **Initial Bse:** 71 280 119 24 57 6 1 29 1 67 24 7
- **Added Vol:** 0 0 0 0 0 0 0 0 0 0 0 0
- **PasserByVol:** 0 9 12 0 0 0 0 0 0 51 11 0
- **Initial Fut:** 71 289 131 24 57 6 1 29 1 118 35 7
- **User Adj:** 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
- **PHF Adj:** 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
- **PHF Volume:** 71 289 131 24 57 6 1 29 1 118 35 7
- **Reduc Vol:** 0 0 0 0 0 0 0 0 0 0 0 0
- **FinalVolume:** 71 289 131 24 57 6 1 29 1 118 35 7

**Critical Gap Module:**

- **Critical Gp:** 4.1 xxxx xxxxx 4.1 xxxx xxxxx 7.1 6.5 6.2 7.1 6.5 6.2
- **FollowUpTim:** 2.2 xxxx xxxxx 2.2 xxxx xxxxx 3.5 4.0 3.3 3.5 4.0 3.3

**Capacity Module:**

- **Conflict Vol:** 63 xxxx xxxxx 420 xxxx xxxxx 626 670 32 588 608 355
- **Potent Cap.:** 1553 xxxx xxxxx 1150 xxxx xxxxx 400 381 1048 424 413 694
- **Move Cap.:** 1553 xxxx xxxxx 1150 xxxx xxxxx 349 355 1048 377 385 694
- **Volume/Cap:** 0.05 xxxx 0.02 xxxx 0.00 0.08 0.00 0.31 0.09 0.01

**Level Of Service Module:**

- **2Way95thQ:** 0.1 xxxx xxxxx 0.1 xxxx xxxxx 0.1 xxxx xxxxx 0.1 xxxx xxxxx 0.1 xxxx xxxxx
- **Control Del:** 7.4 xxxx xxxxx 8.2 xxxx xxxxx 8.2 xxxx xxxxx 8.2 xxxx xxxxx 8.2 xxxx xxxxx
- **LOS by Move:** A * A * * * * * *
- **Movement:** LT - LTR - RT LT - LTR - RT LT - LTR - RT LT - LTR - RT
- **Shared Cap.:** xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx
- **SharedQueue:** xxxxx 0.1 xxxxx xxxxx 0.1 xxxxx xxxxx 0.1 xxxxx xxxxx 0.1 xxxxx xxxxx
- **Shrd ConDel:** xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx xxxxx
- **Shared LOS:** * * A * * C * * C *
- **ApproachDel:** xxxxxx xxxxxxx 15.9 20.8
- **ApproachLOS:** C C

**Note:** Queue reported is the number of cars per lane.

---

**Peak Hour Delay Signal Warrant Report**

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**Intersection #5 Birch St & Sheridan Ave**

---

**Future Volume Alternative: Peak Hour Warrant NOT Met**
Approach: | North Bound | South Bound | East Bound | West Bound
---|---|---|---|---
Movement: | L - T - R | L - T - R | L - T - R | L - T - R
Control: | Uncontrolled | Uncontrolled | Stop Sign | Stop Sign
Lanes: | 0 0 1! 0 0 | 0 1 0 1 0 | 0 0 1! 0 0 | 0 0 1! 0 0
Initial Vol: | 71 289 131 | 24 57 6 | 1 29 1 118 35 | 7
ApproachDel: | xxxxxx | xxxxxx | 15.9 | 20.8

Approach[eastbound][lanes=1][control=Stop Sign]
Signal Warrant Rule #1: [vehicle-hours=0.1]
FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=31]
FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=4][total volume=769]
FAIL - Total volume less than 650 for intersection

Approach[westbound][lanes=1][control=Stop Sign]
Signal Warrant Rule #1: [vehicle-hours=0.9]
FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=160]
SUCCEED - Approach volume greater than or equal to 100 for one lane approach.
Signal Warrant Rule #3: [approach count=4][total volume=769]
FAIL - Total volume less than 650 for intersection

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Future Volume Alternative: Peak Hour Warrant NOT Met
Approach: | North Bound | South Bound | East Bound | West Bound
---|---|---|---|---
Movement: | L - T - R | L - T - R | L - T - R | L - T - R
Control: | Uncontrolled | Uncontrolled | Stop Sign | Stop Sign
Lanes: | 0 0 1! 0 0 | 0 1 0 1 0 | 0 0 1! 0 0 | 0 0 1! 0 0
Initial Vol: | 71 289 131 | 24 57 6 | 1 29 1 118 35 | 7
Major Street Volume: | 578
Minor Approach Volume: | 160
Minor Approach Volume Threshold: 474

Signal Warrant Disclaimer
This peak hour signal warrant analysis should be considered solely as an "indicator" of the likelihood of an unsignalized intersection warranting a traffic signal in the future. Intersections that exceed this warrant are probably more likely to meet one or more of the other volume based signal warrant (such as the 4-hour or 8-hour warrants).

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Intersection #5: Birch St & Sheridan Ave

Final Vol: 6 71 24
Lanes: 0 1 0 1 0

Signal=Uncontrol/Rights=Include

Vol Cnt Date: n/a
Cycle Time (sec): 100
Loss Time (sec): 0

Critical V/C: 0.331
Avg Crit Del (sec/veh): 5.9
Avg Delay (sec/veh): 5.9

LOS: C

Street Name: Birch St
Approach: North Bound
Movement: L - T - R
Volume Module:
Base Vol: 71 280 119 24 6 1 29 1 67 24 7
Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse: 71 280 119 24 6 1 29 1 67 24 7
Added Vol: 0 26 0 0 14 0 0 0 0 0 0
PasserByVol: 0 9 12 0 0 0 0 51 11 0
Initial Fut: 71 315 131 24 71 6 1 29 1 118 35 7
User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Volume: 71 315 131 24 71 6 1 29 1 118 35 7
Reduct Vol: 0 0 0 0 0 0 0 0 0 0 0
FinalVolume: 71 315 131 24 71 6 1 29 1 118 35 7

Critical Gap Module:
Critical Gp: 4.1 xxxx xxxx 4.1 xxxx xxxx 7.1 6.5 6.2 7.1 6.5 6.2
FollowUpTim: 2.2 xxxx xxxx 2.2 xxxx xxxx 3.5 4.0 3.3 3.5 4.0 3.3

Capacity Module:
Cnflict Vol: 77 xxxx xxxx 446 xxxx xxxx 666 710 39 621 648 381
Potent Cap.: 1535 xxxx xxxx 1125 xxxx xxxx 376 361 1039 403 392 671
Move Cap.: 1535 xxxx xxxx 1125 xxxx xxxx 327 336 1039 356 365 671
Volume/Cap: 0.05 xxxx xxxx 0.02 xxxx xxxx 0.00 0.09 0.00 0.33 0.10 0.01

Level Of Service Module:
2Way95thQ: 0.1 xxxx xxxx 0.1 xxxx xxxx xxxx xxxx xxxx xxxx xxxx xxxx xxxx
Control Del: 1 7.5 xxxx xxxx 8.3 xxxx xxxx xxxx xxxx xxxx xxxx xxxx xxxx xxxx
LOS by Move: A * A * A * A * A * * * * * *
Movement: LT - LTR - RT LT - LTR - RT LT - LTR - RT LT - LTR - RT
Shared Cap.: xxxx xxxx xxxx xxxx xxxx xxxx xxxx 343 xxxx xxxx 366 xxxx
SharedQueue: 0.1 xxxx xxxx xxxx 0.1 xxxx xxxx 0.3 xxxx xxxx 2.2 xxxx
Shrd ConDel: 8.3 xxxx xxxx xxxx 16.5 xxxx xxxx 22.3 xxxx
Shared LOS: C * C C * C * C * C * C * C *
ApproachDel: 16.5 22.3
ApproachLOS: * C C

Note: Queue reported is the number of cars per lane.

Future Volume Alternative: Peak Hour Warrant NOT Met
Approach:  | North Bound | South Bound | East Bound | West Bound
Movement:  | L - T - R | L - T - R | L - T - R | L - T - R
Control:   | Uncontrolled | Uncontrolled | Stop Sign | Stop Sign
Lanes:     | 0 0 1! 0 0 | 0 1 0 1 0 | 0 0 1! 0 0 | 0 0 1! 0 0
Initial Vol: | 71 315 131 | 24 71 6 | 1 29 1 118 35 7 |
ApproachDel: | xxxxxx | xxxxxx | 16.5 | 22.3

Approach[ eastbound ][lanes=1][control=Stop Sign]
Signal Warrant Rule #1: [vehicle-hours=0.1]
FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=31]
FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=4][total volume=809]
SUCCEED - Total volume greater than or equal to 800 for intersection with four or more approaches.

Approach[ westbound ][lanes=1][control=Stop Sign]
Signal Warrant Rule #1: [vehicle-hours=1.0]
FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=160]
SUCCEED - Approach volume greater than or equal to 100 for one lane approach.
Signal Warrant Rule #3: [approach count=4][total volume=809]
SUCCEED - Total volume greater than or equal to 800 for intersection with four or more approaches.

SIGNAL WARRANT DISCLAIMER
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Intersection #5 Birch St & Sheridan Ave

Future Volume Alternative: Peak Hour Warrant NOT Met

Approach:  | North Bound | South Bound | East Bound | West Bound
Movement:  | L - T - R | L - T - R | L - T - R | L - T - R
Control:   | Uncontrolled | Uncontrolled | Stop Sign | Stop Sign
Lanes:     | 0 0 1! 0 0 | 0 1 0 1 0 | 0 0 1! 0 0 | 0 0 1! 0 0
Initial Vol: | 71 315 131 | 24 71 6 | 1 29 1 118 35 7 |
Major Street Volume: | 618 |
Minor Approach Volume: | 160 |
Minor Approach Volume Threshold: | 451 |

SIGNAL WARRANT DISCLAIMER
This peak hour signal warrant analysis should be considered solely as an "indicator" of the likelihood of an unsignalized intersection warranting a traffic signal in the future. Intersections that exceed this warrant are probably more likely to meet one or more of the other volume based signal warrant (such as the 4-hour or 8-hour warrants).

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## Level Of Service Computation Report

**2000 HCM 4-Way Stop (Future Volume Alternative)**

**Background PM**

### Intersection #6: Ash St & California Ave

<table>
<thead>
<tr>
<th>Street Name:</th>
<th>Ash St</th>
<th>California Ave</th>
</tr>
</thead>
</table>

#### Approach:

<table>
<thead>
<tr>
<th>Movement</th>
<th>North Bound</th>
<th>South Bound</th>
<th>East Bound</th>
<th>West Bound</th>
</tr>
</thead>
<tbody>
<tr>
<td>L - T - R</td>
<td>L - T - R</td>
<td>L - T - R</td>
<td>L - T - R</td>
<td></td>
</tr>
<tr>
<td>Min. Green:</td>
<td>7 10 10 10</td>
<td>7 10 10 10</td>
<td>7 10 10 10</td>
<td></td>
</tr>
</tbody>
</table>

#### Volume Module:

<table>
<thead>
<tr>
<th>Base Vol:</th>
<th>38 0 27 0 0 0</th>
<th>0 147 30 28 166 0</th>
</tr>
</thead>
<tbody>
<tr>
<td>Growth Adj:</td>
<td>1.00 1.00</td>
<td>1.00 1.00 1.00 1.00</td>
</tr>
<tr>
<td>Initial Bse:</td>
<td>38 0 27</td>
<td>0 0 0 0 147 30 28 166 0</td>
</tr>
<tr>
<td>Added Vol:</td>
<td>0 0 0 0 0</td>
<td>0 0 0 0 0 0</td>
</tr>
<tr>
<td>PasserByVol:</td>
<td>0 0 0 0 0</td>
<td>0 0 0 0 0 0</td>
</tr>
<tr>
<td>Initial Fut:</td>
<td>38 0 27</td>
<td>0 0 0 0 148 30 28 166 0</td>
</tr>
<tr>
<td>User Adj:</td>
<td>1.00 1.00</td>
<td>1.00 1.00 1.00 1.00</td>
</tr>
<tr>
<td>PHF Adj:</td>
<td>1.00 1.00</td>
<td>1.00 1.00 1.00 1.00</td>
</tr>
<tr>
<td>PHF Volume:</td>
<td>38 0 27</td>
<td>0 0 0 0 148 30 28 166 0</td>
</tr>
<tr>
<td>Reduct Vol:</td>
<td>0 0 0 0 0</td>
<td>0 0 0 0 0 0</td>
</tr>
<tr>
<td>Reduced Vol:</td>
<td>38 0 27</td>
<td>0 0 0 0 148 30 28 166 0</td>
</tr>
<tr>
<td>PCE Adj:</td>
<td>1.00 1.00</td>
<td>1.00 1.00 1.00 1.00</td>
</tr>
<tr>
<td>MLF Adj:</td>
<td>1.00 1.00</td>
<td>1.00 1.00 1.00 1.00</td>
</tr>
<tr>
<td>FinalVolume:</td>
<td>38 0 27</td>
<td>0 0 0 0 148 30 28 166 0</td>
</tr>
</tbody>
</table>

#### Saturation Flow Module:

| Adjustment:    | 1.00 1.00     | 1.00 1.00 1.00 1.00 |
| Lanes:         | 0.58 0.00     | 0.42 0.00 0.00 0.00 |
| Final Sat.:    | 433 0 308     | 0 0 0 0 743 867 117 695 0 |

#### Capacity Analysis Module:

| Vol/Sat:       | 0.09 xxxx     | 0.09 xxxx xxxx xxxx xxxx 0.20 0.03 0.24 0.24 xxxx |
| Crit Moves:    | ****         | **** **** **** |
| Delay/Veh:     | 8.0 0.0 8.0   | 0.0 0.0 0.0 8.6 6.9 8.7 8.7 0.0 |
| Delay Adj:     | 1.00 1.00 1.00 | 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 |
| AdjDel/Veh:    | 8.0 0.0 8.0   | 0.0 0.0 0.0 8.6 6.9 8.7 8.7 0.0 |
| LOS by Move:   | A * A * A    | A A A |
| ApproxDel:     | 8.0 xxxxxxx   | 8.4 8.7 |
| Delay Adj:     | 1.00        | xxxx 1.00 |
| ApprAdjDel:    | 8.0         | xxxxxxx 8.4 |
| LOS by Appr:   | A           | A |
| AllWayAvgQ:    | 0.1 0.1 0.1 0.0 0.0 0.0 0.2 0.0 0.3 0.3 0.3 |

**Note:** Queue reported is the number of cars per lane.

---

**Intersection #6 Ash St & California Ave**

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Future Volume Alternative: Peak Hour Warrant NOT Met

<table>
<thead>
<tr>
<th>Approach:</th>
<th>North Bound</th>
<th>South Bound</th>
<th>East Bound</th>
<th>West Bound</th>
</tr>
</thead>
<tbody>
<tr>
<td>Movement:</td>
<td>L - T - R</td>
<td>L - T - R</td>
<td>L - T - R</td>
<td>L - T - R</td>
</tr>
<tr>
<td>Control:</td>
<td>Stop Sign</td>
<td>Stop Sign</td>
<td>Stop Sign</td>
<td>Stop Sign</td>
</tr>
<tr>
<td>Lanes:</td>
<td>0 0 1! 0 0 0 0 0 0 0 0 0 1 0 1 0 1 0 0 0 0 0 0 148 30 28 166 0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Initial Vol:</td>
<td>38 0 27 0 0 0 0 0 148 30 28 166 0</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Major Street Volume: | 372 |
Minor Approach Volume: | 65 |
Minor Approach Volume Threshold: | 626 |

--------------------------------------------------------------------------------

SIGNAL WARRANT DISCLAIMER

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Intersection #6: Ash St & California Ave

Street Name: Ash St & California Ave

Approach: North Bound South Bound East Bound West Bound
Movement: L - T - R L - T - R L - T - R L - T - R

Min. Green: 7 10 10 7 10 10 7 10 10

Volume Module:
Base Vol: 38 0 27 0 0 0 0 0 147 30 28 166 0
Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse: 38 0 27 0 0 0 0 0 147 30 28 166 0
Added Vol: 9 0 0 0 0 0 0 0 24 0 0 33 0
PasserByVol: 0 0 0 0 0 0 0 0 1 0 0 0 0
Initial Fut: 47 0 27 0 0 0 0 0 172 30 28 199 0
User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHE Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHE Volume: 47 0 27 0 0 0 0 0 172 30 28 199 0
Reeduct Vol: 0 0 0 0 0 0 0 0 0 0 0 0
Reduced Vol: 47 0 27 0 0 0 0 0 172 30 28 199 0
PCE Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
MLF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
FinalVolume: 47 0 27 0 0 0 0 0 172 30 28 199 0

Saturation Flow Module:
Adjustment: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Lanes: 0.64 0.00 0.36 0.00 0.00 0.00 0.00 1.00 0.12 0.88 0.00 0.0
Final Sat.: 452 0 260 0 0 0 0 0 734 856 99 705 0

Capacity Analysis Module:
Vol/Sat: 0.10 xxxx 0.10 xxxx xxxx xxxx xxxx 0.23 0.04 0.28 0.28 xxxx
Crit Moves: **** **** ****
Delay/Veh: 8.2 0.0 8.2 0.0 0.0 0.0 0.0 9.0 7.0 9.1 9.1 0.0
Delay Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
AdjDel/Veh: 8.2 0.0 8.2 0.0 0.0 0.0 0.0 9.0 7.0 9.1 9.1 0.0
LOS by Move: A * A * * * A A A *
ApproachDel: 8.2 xxxxxxx 8.7 9.1
Delay Adj: 1.00 xxxxxxx 1.00 1.00
ApprAdjDel: 8.2 xxxxxxx 8.7 9.1
LOS by Appr: A A A
AllWayAvgQ: 0.1 0.1 0.1 0.0 0.0 0.0 0.0 0.3 0.0 0.4 0.4 0.4
Note: Queue reported is the number of cars per lane.

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Future Volume Alternative: Peak Hour Warrant NOT Met

<table>
<thead>
<tr>
<th>Approach:</th>
<th>North Bound</th>
<th>South Bound</th>
<th>East Bound</th>
<th>West Bound</th>
</tr>
</thead>
<tbody>
<tr>
<td>Movement:</td>
<td>L - T - R</td>
<td>L - T - R</td>
<td>L - T - R</td>
<td>L - T - R</td>
</tr>
<tr>
<td>Control:</td>
<td>Stop Sign</td>
<td>Stop Sign</td>
<td>Stop Sign</td>
<td>Stop Sign</td>
</tr>
<tr>
<td>Lanes:</td>
<td>0 0 1! 0 0</td>
<td>0 0 0 0 0</td>
<td>0 0 1 0 1</td>
<td>0 1 0 0 0</td>
</tr>
<tr>
<td>Initial Vol:</td>
<td>47 0 27</td>
<td>0 0 0 0</td>
<td>0 172 30</td>
<td>28 199 0</td>
</tr>
</tbody>
</table>

Major Street Volume: 429
Minor Approach Volume: 74
Minor Approach Volume Threshold: 576

SIGNAL WARRANT DISCLAIMER
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**Intersection #7: ECR & Cambridge Ave**

**Level Of Service Computation Report**

2000 HCM Operations (Future Volume Alternative)
Background PM

- **Final Vol:** 30
- **Signal=Protect/Rights=Include**
- **Lanes:** 0 1 2 0 1

**Final Vol:** 86
- **Signal=Permit**
- **Rights=Include**

**Final Vol:** 17
- **Signal=Permit**
- **Loss Time (sec):** 12

**Final Vol:** 26
- **Cycle Time (sec):** 150
- **Critical V/C:** 0.452
- **Avg Crit Del (sec/veh):** 13.1

**Street Name:**
- **ECR**
- **Cambridge Ave**

**Approach:**
- **North Bound**
- **South Bound**
- **East Bound**
- **West Bound**

**Movement:**
- **L - T - R**
- **L - T - R**
- **L - T - R**
- **L - T - R**

- **Min. Green:** 7 10 10 7 10 10 7 10 10 7 10 10
- **Y+R:** 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0

**Volume Module:**
- **Base Vol:** 22 1347 37 61 1730 28 86 17 26 67 37 129
- **User Adj:** 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
- **PHF Adj:** 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
- **Initial Fut:** 23 1449 39 64 1844 30 86 17 26 67 39 129
- **User Adj:** 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
- **PHF Adj:** 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
- **Final Volume:** 23 1449 39 64 1844 30 86 17 26 67 39 129

**Saturation Flow Module:**
- **Sat/Lane:** 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900
- **Adjustment:** 0.92 0.92 0.92 0.92 0.92 0.92 0.92 0.92 0.92 0.92 0.92 0.92
- **Lanes:** 1.00 2.91 0.09 1.00 2.95 0.05 0.68 0.12 0.20 0.65 0.35 1.00
- **Final Sat.:** 1750 5538 149 1750 5601 91 1179 233 356 1139 663 1750

**Capacity Analysis Module:**
- **Vol/Sat:** 0.01 0.26 0.26 0.04 0.33 0.33 0.07 0.07 0.07 0.06 0.06 0.07
- **Crit Moves:** ****
- **Green Time:** 7.0 96.8 96.8 17.3 107 107.0 24.0 24.0 24.0 24.0 24.0 24.0
- **Volume/Cap:** 0.28 0.41 0.41 0.32 0.46 0.46 0.46 0.46 0.46 0.37 0.37 0.46
- **Uniform Del:** 69.1 12.8 12.8 61.0 9.2 9.2 57.1 57.1 57.1 56.3 56.3 57.2
- **IncremntDel:** 1.9 0.1 0.1 0.9 0.1 0.1 1.2 1.2 1.2 0.8 0.8 1.2
- **InitQueuDel:** 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0
- **Delay Adj:** 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
- **Delay/Veh:** 71.0 12.9 12.9 61.9 9.3 9.3 58.3 58.3 58.3 57.1 57.1 58.4
- **User DelAdj:** 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
- **AdjDel/Veh:** 71.0 12.9 12.9 61.9 9.3 9.3 58.3 58.3 58.3 57.1 57.1 58.4
- **LOS by Move:** E B E A A E+ E+ E+ E+ E+ E+
- **HCM2kAvgQ:** 1 11 11 3 12 12 6 6 6 5 5 6

Note: Queue reported is the number of cars per lane.
Level Of Service Computation Report
2000 HCM Operations (Future Volume Alternative)
Background+Project PM

Interchange #7: ECR & Cambridge Ave

Street Name: ECR Cambridge Ave

Approach: North Bound South Bound East Bound West Bound

Move | L - T - R | L - T - R | L - T - R | L - T - R
--- | --- | --- | --- | ---
Min. Green: 7 10 10 | 7 10 10 | 7 10 10 | 7 10 10
Y+R: 4.0 4.0 | 4.0 4.0 | 4.0 4.0 | 4.0 4.0

Volume Module:
Base Vol: 22 1347 37 | 61 1730 28 | 86 17 26 | 67 37 129
Growth Adj: 1.00 1.00 | 1.00 1.00 | 1.00 1.00 | 1.00 1.00
Initial Bse: 22 1347 | 37 61 1730 | 86 17 26 | 67 37 129
Added Vol: 0 0 | 0 0 | 0 0 | 0 0
PasserByVol: 1 102 | 2 3 114 | 2 0 0 | 0 2 0
Initial Fut: 23 1456 | 39 64 185 | 30 86 17 | 26 67 39
User Adj: 1.00 1.00 | 1.00 1.00 | 1.00 1.00 | 1.00 1.00
PHF Adj: 1.00 1.00 | 1.00 1.00 | 1.00 1.00 | 1.00 1.00
PHF Volume: 23 1456 | 39 64 185 | 30 86 17 | 26 67 39
Reduced Vol: 0 0 | 0 0 | 0 0 | 0 0
PCE Adj: 1.00 1.00 | 1.00 1.00 | 1.00 1.00 | 1.00 1.00
MLF Adj: 1.00 1.00 | 1.00 1.00 | 1.00 1.00 | 1.00 1.00
FinalVolume: 23 1456 | 39 64 185 | 30 86 17 | 26 67 39

Saturation Flow Module:
Sat/Lane: 1900 1900 1900 1900 1900 | 1900 1900 1900 | 1900 1900 1900
Adjustment: 0.92 0.92 0.92 0.92 | 1.00 0.92 0.92 | 0.92 0.92 1.00 0.92
Lanes: 1.00 1.00 0.08 1.00 | 2.92 0.08 0.92 | 1.00 0.92 1.00 0.92
Final Sat.: 1750 5539 148 | 1750 5601 91 | 1179 233 356 | 1139 663 1750

Capacity Analysis Module:
Vol/Sat: 0.01 0.26 | 0.26 0.04 0.33 | 0.33 0.07 0.07 | 0.07 0.06 0.06 0.07
Crit Moves: **** | **** 0.92 0.92 | 0.92 0.92 0.92 | 0.92 0.92 0.92
Green Time: 7.0 96.9 | 69.6 172 107 | 107 23.9 23.9 | 23.9 23.9 23.9
Volume/Cap: 0.28 0.41 | 0.41 0.32 0.46 | 0.46 0.46 0.46 | 0.46 0.37 0.37 0.46
Uniform Del: 69.1 12.7 | 12.7 61.0 9.2 | 9.2 57.2 57.2 | 57.2 57.2 57.2
IncremntDel: 1.9 0.1 | 0.1 0.9 0.1 | 0.1 1.2 1.2 | 1.2 0.8 0.8 1.2
InitQeuDel: 0.0 0.0 | 0.0 0.0 0.0 | 0.0 0.0 0.0 | 0.0 0.0 0.0
Delay Adj: 1.00 1.00 | 1.00 1.00 1.00 | 1.00 1.00 1.00 | 1.00 1.00 1.00
Delay/Veh: 71.0 12.8 | 12.8 61.9 9.2 | 9.2 58.4 58.4 | 58.4 58.4 58.4
User DelAdj: 1.00 1.00 | 1.00 1.00 1.00 | 1.00 1.00 1.00 | 1.00 1.00 1.00
AdjDel/Veh: 71.0 12.8 | 12.8 61.9 9.2 | 9.2 58.4 58.4 | 58.4 58.4 58.4
LOS by Move: E B A E+ | B E A E+ E+ E+ E+ E+
HCM2kAvgQ: 1 11 11 | 13 12 12 | 6 6 6 5 5 6

Note: Queue reported is the number of cars per lane.
**Level Of Service Computation Report**

2000 HCM Operations (Future Volume Alternative)

**Background PM**

### Intersection #8: ECR & California Ave

**Final Vol:** 1824***  **Signal=Protect/Rights=Include**

**Final Vol:** 73***  **Signal=Protect**

**Final Vol:** 1341  **Signal=Protect/Rights=Include**

#### Street Name:

**ECR**

**California Ave**

**Approach:**

**North Bound**

**South Bound**

**East Bound**

**West Bound**

**Movement:**

<table>
<thead>
<tr>
<th>L</th>
<th>T</th>
<th>R</th>
</tr>
</thead>
<tbody>
<tr>
<td>L</td>
<td>T</td>
<td>R</td>
</tr>
<tr>
<td>L</td>
<td>T</td>
<td>R</td>
</tr>
<tr>
<td>L</td>
<td>T</td>
<td>R</td>
</tr>
</tbody>
</table>

**Min. Green:**

7 10 10 7 10 10 7 10 10 7 10 10

**Y+R:**

4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0

**Vol Cnt Date:** n/a

**Cycle Time (sec):** 150

**Loss Time (sec):** 12

**Critical V/C:** 0.581

**Avg Crit Del (sec/veh):** 27.9

**Avg Delay (sec/veh):** 28.5

**Critical Vol:**

7 3 * * * 0

**Critical Vol:**

85***

**LOS:** C

**Volume Module:**

**Base Vol:**

69 1241 74 1712 51 122 73 130 85 31 67

**Growth Adj:**

1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00

**Initial Bse:**

69 1241 74 1712 51 122 73 130 85 31 67

**Added Vol:**

0 0 0 0 0 0 0 0 0 0 0 0

**PasserByVol:**

4 100 5 17 112 8 3 0 0 0 2 2

**Initial Fut:**

73 1341 90 91 1824 59 125 73 130 85 33 69

**User Adj:**

1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00

**PHF Adj:**

1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00

**PHF Volume:**

73 1341 90 91 1824 59 125 73 130 85 33 69

**Reduced Vol:**

0 0 0 0 0 0 0 0 0 0 0 0

**PCE Adj:**

1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00

**MLF Adj:**

1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00

**FinalVolume:**

73 1341 90 91 1824 59 125 73 130 85 33 69

**Saturation Flow Module:**

**Sat/Lane:**

1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900

**Adjustment:**

0.92 1.00 0.92 1.00 0.92 1.00 0.92 1.00 0.92 0.92 1.00 0.92

**Lanes:**

1.00 2.80 0.20 1.00 2.90 0.10 1.00 0.34 0.66 1.00 1.00 1.00

**Final Sat.:**

1750 5313 357 1750 5507 178 1750 648 1153 1750 1900 1750

**Capacity Analysis Module:**

**Vol/Sat:**

0.04 0.25 0.25 0.05 0.33 0.33 0.07 0.11 0.11 0.05 0.02 0.04

**Crit Moves:**

****

**Green Time:**

10.8 79.9 79.9 16.5 85.6 85.6 21.5 29.1 29.1 12.5 20.1 20.1

**Volume/Cap:**

0.58 0.47 0.47 0.47 0.58 0.58 0.50 0.58 0.58 0.58 0.13 0.29

**Uniform Del:**

67.4 21.9 21.9 62.7 20.7 20.7 59.2 54.9 54.9 66.2 57.2 58.5

**IncremntDel:**

6.7 0.1 0.1 1.8 0.3 0.3 1.5 2.5 2.5 5.8 0.2 0.7

**InitQueueDel:**

0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0

**Delay Adj:**

1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00

**Delay/Veh:**

74.1 22.0 22.0 64.6 21.0 21.0 60.8 57.4 57.4 72.0 57.5 59.2

**User Del/Adj:**

1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00

**AdjDel/Veh:**

74.1 22.0 22.0 64.6 21.0 21.0 60.8 57.4 57.4 72.0 57.5 59.2

**LOS by Move:**

E  C+  C+  C+  C+  E+  E+  E+  E+  E+  E+  E+

**HCM2kAvgQ:**

4 13 13 4 18 18 6 9 9 5 1 3

**Note:** Queue reported is the number of cars per lane.
Level Of Service Computation Report
2000 HCM Operations (Future Volume Alternative)
Background+Project PM

Intersection #8: ECR & California Ave

Critical V/C: 0.586
Avg Crit Del (sec/veh): 28.5
Avg Delay (sec/veh): 29.2

Cycle Time (sec): 150
Loss Time (sec): 12

Min. Green: 7 10 10
Y+R: 4.0 4.0 4.0 4.0

Streets Name: ECR                      California Ave
Approach:  North Bound          South Bound          East Bound          West Bound
Movement: | L - T - R | L - T - R | L - T - R | L - T - R |
-----------|-----------|-----------|-----------|-----------|
Min. Green: 7 10 10 10   7 10 10 10   7 10 10 10   7 10 10 10
Y+R: 4.0 4.0 4.0 4.0   4.0 4.0 4.0 4.0   4.0 4.0 4.0 4.0   4.0 4.0 4.0 4.0

Volume Module:
Base Vol: 69 1241 85 74 1712 51 122 73 130 85 31 67
Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse: 69 1241 85 74 1712 51 122 73 130 85 31 67
Added Vol: 0 0 0 0 7 0 0 0 0 8 0 7
PasserByVol: 4 100 5 17 112 8 3 0 0 0 2 2
Initial Fut: 73 1341 90 98 1824 59 125 73 130 93 33 76
User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Volume: 73 1341 90 98 1824 59 125 73 130 93 33 76
Reduct Vol: 0 0 0 0 0 0 0 0 0 0 0 0
Reduced Vol: 73 1341 90 98 1824 59 125 73 130 93 33 76
PCE Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
MLF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
FinalVolume: 73 1341 90 98 1824 59 125 73 130 93 33 76

Saturation Flow Module:
Sat/Lane: 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900
Adjustment: 0.92 1.00 0.92 1.00 0.92 0.92 1.00 0.92 0.92 1.00 0.92 0.92
Lanes: 1.00 2.80 0.20 1.00 2.90 0.10 1.00 0.34 0.66 1.00 1.00 1.00
Final Sat.: 1750 5313 357 1750 5507 178 1750 648 1153 1750 1900 1750

Capacity Analysis Module:
Vol/Sat: 0.04 0.25 0.25 0.06 0.33 0.33 0.07 0.11 0.11 0.05 0.02 0.04
Crit Moves: ****  ****  ****  ****
Green Time: 10.7 78.2 78.2 17.3 84.8 84.8 22.0 28.9 28.9 13.6 20.5 20.5
Volume/Cap: 0.59 0.48 0.48 0.48 0.59 0.59 0.49 0.59 0.59 0.59 0.13 0.32
Uniform Del: 65.7 23.0 23.0 62.1 21.2 21.2 58.8 55.1 55.1 65.5 56.9 58.4
Increment Del: 7.0 0.1 0.1 1.8 0.3 0.3 1.5 2.6 2.6 5.6 0.2 0.8
InitQueue Del: 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0
Delay Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Delay/Veh: 74.5 23.1 23.1 64.0 21.4 21.4 60.3 57.7 57.7 71.0 57.1 59.2
User Del Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Adj Del/Veh: 74.5 23.1 23.1 64.0 21.4 21.4 60.3 57.7 57.7 71.0 57.1 59.2
LOS by Move: E  C  C  E  C+  C+  E  E+  E+  E  E+  E+
HCM2kAvgQ: 4  14  14  4  18  18  6  9  9  5  1  4

Note: Queue reported is the number of cars per lane.
Intersection #9: El Camino Real & Page Mill Rd

**Level Of Service Computation Report**

**2000 HCM Operations (Future Volume Alternative)**

**Background PM**

**Intersection #9: El Camino Real & Page Mill Rd**

**Final Vol:**

- **Lanes:** 1 0 3 0 2
- **Signal=Protect/Rights=Include
- **Vol Cnt Date:** n/a
- **Cycle Time (sec):** 125
- **Loss Time (sec):** 12
- **Critical V/C:** 0.842
- **Avg Crit Del (sec/veh):** 53.4
- **Avg Delay (sec/veh):** 48.9
- **LOS:** D

**Street Name:** El Camino Real

**Approach:**

- **North Bound**
- **South Bound**
- **East Bound**
- **West Bound**

**Movement:**

- **Min. Green:** 7 30 0 7 30 0 7 28 28 7 30 0
- **Y+R:** 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0

**Volume Module:**

- **Base Vol:** 247 788 224 462 1212 260 334 1097 265 303 748 174
- **Growth Adj:** 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
- **Initial Bse:** 247 788 224 462 1212 260 334 1097 265 303 748 174
- **Added Vol:** 0 0 0 0 0 0 0 0 0 0 0 0
- **PasserByVol:** 24 62 13 27 27 27 27 27 27 27 27 27
- **Initial Fut:** 271 850 237 489 1291 282 345 1104 266 324 802 184
- **User Adj:** 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
- **PHF Adj:** 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
- **PHF Volume:** 271 850 237 489 1291 282 345 1104 266 324 802 184
- **Reduced Vol:** 271 850 237 489 1291 282 345 1104 266 324 802 184
- **PCE Adj:** 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
- **MLF Adj:** 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
- **FinalVolume:** 271 850 237 489 1291 282 345 1104 266 324 802 184

**Saturation Flow Module:**

- **Sat/Lane:** 1900 1900 1800 1800 1800 1800 1800 1800 1800 1800 1800 1800
- **Adjustment:** 0.83 1.00 0.97 0.83 1.00 0.97 0.83 1.00 0.92 0.69 1.00 0.97
- **Lanes:** 2.00 2.33 0.67 2.00 3.00 1.00 2.00 2.00 1.00 2.00 1.62 0.38
- **Final Sat.:** 3150 4330 1075 3150 5700 1847 3150 3800 1750 2625 3074 2875

**Capacity Analysis Module:**

- **Vol/Sat:** 0.09 0.19 0.19 0.16 0.23 0.15 0.11 0.29 0.15 0.12 0.26 0.26
- **Crit Moves:** **** **** **** ****
- **Green Time:** 13.9 30.0 30.0 22.6 38.7 38.7 17.8 42.4 42.4 18.0 42.5 42.5
- **Volume/Cap:** 0.77 0.80 0.80 0.86 0.73 0.49 0.77 0.86 0.45 0.86 0.77 0.77
- **Uniform Del:** 54.0 44.7 44.7 49.6 38.5 35.1 51.6 38.5 32.2 52.2 36.8 36.8
- **IncremntDel:** 15.3 5.0 5.0 15.3 2.7 3.0 11.8 7.5 2.4 21.4 4.4 4.4
- **InitQueueDel:** 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0
- **Delay Adj:** 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
- **Delay/Veh:** 69.4 49.7 49.7 64.9 41.2 38.1 63.4 46.0 34.7 73.7 41.2 41.2
- **User Del/Adj:** 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
- **AdjDel/Veh:** 69.4 49.7 49.7 64.9 41.2 38.1 63.4 46.0 34.7 73.7 41.2 41.2
- **LOS by Move:** E D E D E D+ E D C- E D D

Note: Queue reported is the number of cars per lane.

Traffic 8.0.0715

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Level Of Service Computation Report

2000 HCM Operations (Future Volume Alternative)

Background+Project PM

Intersection #9: El Camino Real & Page Mill Rd

**Final Vol:** 282 1291 497***

**Lanes:** 1 3 2 0

**Signal=Protect/Rights=Include**

**Vol Cnt Date:** n/a

**Cycle Time (sec):** 125

**Loss Time (sec):** 12

**Critical V/C:** 0.851

**Avg Crit Del (sec/veh):** 54.2

**Avg Delay (sec/veh):** 49.3

**LOS:** D

**Cycle Time (sec):** 184

**Loss Time (sec):** 1

**Critical V/C:** 1.00

**Avg Crit Del (sec/veh):** 0

**Avg Delay (sec/veh):** 0

**LOS:** D

**Street Name:** El Camino Real & Page Mill Rd

**Approach:** North Bound  South Bound  East Bound  West Bound

**Movement:** L  -  T  -  R  L  -  T  -  R  L  -  T  -  R  L  -  T  -  R

**Min. Green:**

**Y+R:** 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0

**Volume Module:**

**Base Vol:** 247 788 224 462 1212 260 334 1097 265 303 748 174

**Growth Adj:** 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00

**Initial Bse:** 247 788 224 462 1212 260 334 1097 265 303 748 174

**Added Vol:** 0 9 0 8 0 0 3 2 0 10 5 0

**PasserByVol:** 24 62 13 27 13 27 13 27 13 27 13 27

**Initial Fut:** 271 859 237 497 1291 282 348 1106 266 334 807 184

**User Adj:** 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00

**PHF Adj:** 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00

**PHF Volume:** 271 859 237 497 1291 282 348 1106 266 334 807 184

**Reduct Vol:** 0 0 0 0 0 0 0 0 0 0 0 0

**Reduced Vol:** 271 859 237 497 1291 282 348 1106 266 334 807 184

**PCE Adj:** 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00

**MLF Adj:** 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00

**FinalVol:** 271 859 237 497 1291 282 348 1106 266 334 807 184

**Saturation Flow Module:**

**Sat/Lane:** 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900

**Adjustment:** 0.83 1.00 0.97 0.83 1.00 0.97 0.83 1.00 0.92 0.69 1.00 0.97

**Lanes:** 2.00 2.34 0.66 2.00 3.00 1.00 2.00 2.00 1.00 2.00 1.62 0.38

**Final Sat.:** 3150 4440 1225 3150 5700 1847 3150 3800 1750 2625 3078 702

**Capacity Analysis Module:**

**Vol/Sat:** 0.09 0.19 0.19 0.16 0.23 0.15 0.11 0.29 0.15 0.13 0.26 0.26

**Crit Moves:** **** **** **** ****

**Green Time:** 13.9 30.0 30.0 22.7 38.8 38.8 17.9 41.9 41.9 18.3 42.4 42.4

**Volume/Cap:** 0.77 0.81 0.81 0.87 0.73 0.49 0.77 0.87 0.45 0.87 0.77 0.77

**Uniform Del:** 54.0 44.8 44.8 49.7 38.4 35.1 51.6 38.9 32.5 52.1 37.0 37.0

**IncremntDel:** 15.2 5.2 5.2 16.2 2.7 3.0 12.2 8.1 2.5 22.3 4.6 4.6

**InitQueuDel:** 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0

**Delay Adj:** 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00

**Delay/Veh:** 69.2 50.0 50.0 65.9 41.1 38.1 63.8 47.1 35.1 74.4 41.6 41.6

**User DelAdj:** 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00

**AdjDel/Veh:** 69.2 50.0 50.0 65.9 41.1 38.1 63.8 47.1 35.1 74.4 41.6 41.6

**Note:** Queue reported is the number of cars per lane.
Intersection #10: PAGEMILL-OREGON EXPWY/MIDDLEFIELD RD

Final Vol: 111  496***  47
Lanes: 0 1 1  0 1

Signal=Protect/Rights=Include

Final Vol: 117  52
Lanes: 0 1

Signal=Protect

Final Vol: 118***  904
Lanes: 0 1

Signal=Protect/Rights=Include

Final Vol: 220  202***
Lanes: 1 0 1  0 1

Signal=Protect

Final Vol: 174***  379    101
Lanes: 1 0 1  0 1

Signal=Protect/Rights=Include

Approach: North Bound   South Bound   East Bound   West Bound
Movement: L - T - R    L - T - R    L - T - R    L - T - R

Min. Green: 7 10 10 7 10 10 7 10 10 7 10 10
Y+R: 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0

Volume Module:
Base Vol: 168 366 98 45 472 106 117 1136 220 202 895 52
Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse: 168 366 98 45 472 106 117 1136 220 202 895 52
Added Vol: 0 0 0 0 0 0 0 0 0 0 0 0
PasserByVol: 6 13 3 2 24 5 0 52 0 0 9 0
Initial Fut: 174 379 101 47 496 111 117 1188 220 202 904 52
User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Volume: 174 379 101 47 496 111 117 1188 220 202 904 52
Reduced Vol: 174 379 101 47 496 111 117 1188 220 202 904 52
PCE Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
MLF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
FinalVolume: 174 379 101 47 496 111 117 1188 220 202 904 52

Saturation Flow Module:
Sat/Lane: 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900
Adjustment: 0.88 1.00 0.78 0.88 0.97 0.90 0.88 1.00 0.78 0.88 1.00 0.78
Lanes: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Final Sat.: 1663 1900 1488 1663 2975 666 1663 3800 1488 1663 3800 1488

Capacity Analysis Module:
Vol/Sat: 0.10 0.20 0.07 0.03 0.17 0.17 0.07 0.31 0.15 0.12 0.24 0.03
Crit Moves: ****  ****  ****  ****
Green Time: 24.9 54.1 54.1 10.5 39.7 39.7 23.6 74.4 74.4 28.9 79.8 79.8
Volume/Cap: 0.76 0.66 0.23 0.48 0.76 0.76 0.54 0.76 0.36 0.76 0.54 0.08
Uniform Del: 74.6 55.0 47.3 82.1 65.6 65.6 73.1 45.0 36.3 72.2 36.6 28.9
IncremntDel: 13.4 2.9 0.3 3.7 4.1 4.1 2.6 2.2 0.4 11.7 0.3 0.1
InitQueuDel: 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0
Delay Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Delay/Veh: 88.0 58.0 47.5 85.8 69.8 69.8 75.7 47.2 36.7 83.8 37.0 29.0
User DelAdj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
AdjDel/Veh: 88.0 58.0 47.5 85.8 69.8 69.8 75.7 47.2 36.7 83.8 37.0 29.0
LOS by Move: F E+ D F E E- D+ D+ C
HCM2kAvgQ: 11 18 4 3 17 17 7 28 9 13 18 2
Note: Queue reported is the number of cars per lane.
## Level of Service Computation Report

**2000 HCM Operations (Future Volume Alternative)**

**Background+Project PM**

**Intersection #10: PAGEMILL-OREGON EXPWY/MIDDLEFIELD RD**

### Signal=Protect/Rights=Include

#### Final Vol: 178***

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<td>180</td>
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<td>Loss Time (sec): 12</td>
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<td>Critical V/C: 0.762</td>
<td>2 913</td>
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<tr>
<td>Avg Crit Del (sec/veh): 60.5</td>
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<tr>
<td>Avg Delay (sec/veh): 53.7</td>
<td>1 202***</td>
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**Final Volume:**

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<th>South Bound</th>
<th>East Bound</th>
<th>West Bound</th>
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<td>L - T - R</td>
<td>L - T - R</td>
<td>L - T - R</td>
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<td>Lanes</td>
<td>178***</td>
<td>379</td>
<td>101</td>
<td></td>
</tr>
</tbody>
</table>

**Volume Module:**

| Base Vol: | 168 366 98 | 45 472 106 | 117 1136 220 | 202 895 52 |
| Growth Adj: | 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 |
| Initial Bse: | 168 366 98 | 45 472 106 | 117 1136 220 | 202 895 52 |
| Added Vol: | 4 0 0 | 4 0 0 | 4 0 0 | 4 0 0 |
| PasserByVol: | 6 13 3 | 2 24 5 | 0 52 0 | 0 9 0 |
| Initial Fut: | 178 379 101 | 47 496 114 | 120 1198 224 | 202 913 52 |
| User Adj: | 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 |
| PHF Adj: | 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 |
| PHF Volume: | 178 379 101 | 47 496 114 | 120 1198 224 | 202 913 52 |
| Reduct Vol: | 0 0 0 | 0 0 0 | 0 0 0 | 0 0 0 |
| Reduced Vol: | 178 379 101 | 47 496 114 | 120 1198 224 | 202 913 52 |
| PCE Adj: | 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 |
| MLF Adj: | 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 |
| FinalVolume: | 178 379 101 | 47 496 114 | 120 1198 224 | 202 913 52 |

**Saturation Flow Module:**

| Sat/Lane: | 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 |
| Adjustment: | 0.88 1.00 0.78 0.88 0.97 0.90 0.88 1.00 0.78 0.88 1.00 0.78 |
| Lanes: | 1.00 1.00 1.00 1.00 1.60 0.40 1.00 2.00 1.00 1.00 2.00 1.00 |
| Final Sat.: | 1663 1400 1488 1663 2956 679 1663 3800 1488 1663 3800 1488 |

**Capacity Analysis Module:**

| Vol/Sat: | 0.11 0.20 0.07 0.03 0.17 0.17 0.07 0.32 0.15 0.12 0.24 0.03 |
| Crit Moves: | **** | **** | **** |
| Green Time: | 25.3 54.3 54.3 10.6 39.6 39.6 23.8 74.4 74.4 28.7 79.3 79.3 |
| Volume/Cap: | 0.76 0.66 0.23 0.48 0.76 0.55 0.76 0.36 0.76 0.55 0.08 |
| Uniform Del: | 74.5 54.8 47.1 82.0 65.8 65.8 73.0 45.2 36.4 72.4 37.1 29.2 |
| IncremntDel: | 13.8 2.9 0.3 3.7 4.4 4.4 2.8 2.3 0.4 12.3 0.4 0.1 |
| InitQueuDel: | 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 |
| Delay Adj: | 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 |
| Delay/Veh: | 88.2 57.7 47.3 85.7 70.1 70.1 75.9 47.5 36.8 84.7 37.5 29.2 |
| User DelAdj: | 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 |
| AdjDel/Veh: | 88.2 57.7 47.3 85.7 70.1 70.1 75.9 47.5 36.8 84.7 37.5 29.2 |
| LOS by Move: | F E+ D F E E D+ E D+ C |
| HCM2kAvgQ: | 12 18 4 3 17 17 7 29 9 13 18 2 |

Note: Queue reported is the number of cars per lane.
Intersection #1: Park Blvd & Sherman Ave

**Level Of Service Computation Report**

**2000 HCM Unsignalized (Future Volume Alternative)**

**Cumulative AM**

**Intersection #1: Park Blvd & Sherman Ave**

**Approach:**
- **North Bound:** Park Blvd
- **South Bound:** Sherman Ave
- **East Bound:** Park Blvd
- **West Bound:** Sherman Ave

**Movement:**
- **L - T - R**
- **L - T - R**
- **L - T - R**
- **L - T - R**

**Volume Module:**
- **Base Vol:** 50 170 10 10 190 10 10 0 40 10 10 10
- **Growth Adj:** 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
- **Initial Bse:** 50 170 10 10 190 10 10 0 40 10 10 10
- **Added Vol:** 0 0 0 0 0 0 0 0 0 0 0 0
- **PasserByVol:** 0 0 0 0 0 0 0 0 0 0 0 0
- **Initial Fut:** 50 170 10 10 190 10 10 0 40 10 10 10
- **User Adj:** 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
- **PHF Adj:** 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
- **PHF Volume:** 50 170 10 10 190 10 10 0 40 10 10 10
- **Reduce Vol:** 0 0 0 0 0 0 0 0 0 0 0 0
- **FinalVolume:** 50 170 10 10 190 10 10 0 40 10 10 10

**Critical Gap Module:**
- **Critical Gp:** 4.1 xxxx xxxx 4.1 xxxx xxxx 7.1 6.5 6.2 7.1 6.5 6.2
- **FollowUpTim:** 2.2 xxxx xxxx 2.2 xxxx xxxx 3.5 4.0 3.3 3.5 4.0 3.3

**Capacity Module:**
- **Cnflict Vol:** 200 xxxx xxxx 180 xxxx xxxx 500 495 195 510 495 175
- **Potent Cap.:** 1384 xxxx xxxx 1408 xxxx xxxx 484 479 851 477 479 874
- **Move Cap.:** 1384 xxxx xxxx 1408 xxxx xxxx 455 458 851 439 458 874
- **Volume/Cap:** 0.04 xxxx xxxx 0.01 xxxx xxxx 0.02 0.00 0.05 0.02 0.02 0.01

**Level Of Service Module:**
- **2Way95thQ:** 0.1 xxxx xxxx 0.0 xxxx xxxx xxxx xxxx xxxx xxxx xxxx xxxx xxxx xxxx xxxx xxxx
- **Control Del:** 7.7 xxxx xxxx 7.6 xxxx xxxx xxxx xxxx xxxx xxxx xxxx xxxx xxxx xxxx xxxx xxxx
- **LOS by Move:**
  - A * A * * * * *
  - Movement: LT - LTR - RT LT - LTR - RT LT - LTR - RT LT - LTR - RT
  - **Shared Cap.:** 725 xxxx xxxx 535 xxxx 725 xxxx xxxx 535 xxxx
  - **Shrd Queue:** 0.2 xxxx xxxx 0.2 xxxx xxxx 0.2 xxxx xxxx
  - **Shrd ConDel:** 0.3 xxxx xxxx 12.1 xxxx xxxx
  - **Shared LOS:** B * B * B * * *
- **ApproachDel:** 10.3 12.1
- **ApproachLOS:** B B

**Note:** Queue reported is the number of cars per lane.

---

**Peak Hour Delay Signal Warrant Report**

**Intersection #1 Park Blvd & Sherman Ave**

**Future Volume Alternative: Peak Hour Warrant NOT Met**
Approach Del: xxxxxx           xxxxxx             10.3             12.1

Signal Warrant Rule #1: [vehicle-hours=0.1]
FAIL - Vehicle-hours less than 4 for one lane approach.

Signal Warrant Rule #2: [approach volume=50]
FAIL - Approach volume less than 100 for one lane approach.

Signal Warrant Rule #3: [approach count=4][total volume=520]
FAIL - Total volume less than 650 for intersection with less than four approaches.

Signal Warrant Disclaimer
This peak hour signal warrant analysis should be considered solely as an "indicator" of the likelihood of an unsignalized intersection warranting a traffic signal in the future. Intersections that exceed this warrant are probably more likely to meet one or more of the other volume based signal warrant (such as the 4-hour or 8-hour warrants).

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Level Of Service Computation Report
2000 HCM Unsignalized (Future Volume Alternative)
Cumulative+Project AM

Intersection #1: Park Blvd & Sherman Ave

Street Name: Park Blvd Sherman Ave
Approach: North Bound South Bound East Bound West Bound

Movement: L - T - R L - T - R L - T - R L - T - R

Volume Module:
- Base Vol: 50 170 10 10 190 10 10 0 40 10 10 10
- Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
- Initial Bse: 50 170 10 10 190 10 10 0 40 10 10 10
- Added Vol: 12 0 0 0 0 11 5 0 17 0 0 0
- PasserByVol: 0 0 0 0 0 0 0 0 0 0 0 0
- Initial Fut: 62 170 10 10 190 21 15 0 57 10 10 10
- User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
- PHF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
- PHF Volume: 62 170 10 10 190 21 15 0 57 10 10 10
- Reduct Vol: 0 0 0 0 0 0 0 0 0 0 0 0
- FinalVolume: 62 170 10 10 190 21 15 0 57 10 10 10

Capacity Module:
- Cnflict Vol: 211 xxxx xxxx xxxx 1408 xxxx xxxx xxxx 530 525 201 548 530 175
- Potent Cap.: 1372 xxxx xxxx xxxx 1408 xxxx xxxx xxxx 463 461 846 450 457 874
- Move Cap.: 1372 xxxx xxxx xxxx 1408 xxxx xxxx xxxx 431 436 846 403 433 874
- Volume/Cap: 0.05 xxxx xxxx xxxx 0.01 xxxx xxxx xxxx 0.03 0.00 0.07 0.02 0.02 0.01

Level Of Service Module:
- 2Way95thQ: 0.1 xxxx xxxx 0.0 xxxx xxxx xxxx xxxx xxxx xxxx xxxx xxxx xxxx xxxx xxxx
- Control Del: 7.7 xxxx xxxx xxxx 7.6 xxxx xxxx xxxx xxxx xxxx xxxx xxxx xxxx xxxx xxxx
- LOS by Move: A * * A * * A * * * * *
- Movement: LT - LTR - RT LT - LTR - RT LT - LTR - RT LT - LTR - RT
- Shared Cap.: xxxx xxxx xxxx xxxx xxxx xxxx xxxx 705 xxxx xxxx 505 xxxx 0.3 xxxx xxxx 0.2 xxxx
- SharedQueue: xxxx xxxx xxxx xxxx xxxx xxxx xxxx 0.3 xxxx xxxx 0.2 xxxx
- Shrd ConDel: xxxx xxxx xxxx xxxx xxxx xxxx xxxx 10.7 xxxx xxxx 12.6 xxxx
- Shared LOS: * * * * * B * B *
- ApproachDel: xxxxxx xxxxxx 10.7 12.6
- ApproachLOS: * B B

Note: Queue reported is the number of cars per lane.

Peak Hour Delay Signal Warrant Report

Intersection #1 Park Blvd & Sherman Ave

Future Volume Alternative: Peak Hour Warrant NOT Met
### Approach:

<table>
<thead>
<tr>
<th>Movement</th>
<th>North Bound</th>
<th>South Bound</th>
<th>East Bound</th>
<th>West Bound</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>L - T - R</td>
<td>L - T - R</td>
<td>L - T - R</td>
<td>L - T - R</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Control</th>
<th>Uncontrolled</th>
<th>Uncontrolled</th>
<th>Stop Sign</th>
<th>Stop Sign</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lanes</td>
<td>0 0 0 0 0 0 0 0 1! 0 0 0 0 1! 0 0 0 0 1! 0 0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Initial Vol</td>
<td>62 170 10 10 190 21 15 0 57 10 10 10</td>
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<td></td>
<td></td>
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<tr>
<td>Approach Del</td>
<td>xxxxxx</td>
<td>xxxxxx</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Approach [Eastbound] [lanes=1] [control=Stop Sign]

**Signal Warrant Rule #1:** [vehicle-hours=0.2]

FAIL - Vehicle-hours less than 4 for one lane approach.

**Signal Warrant Rule #2:** [approach volume=72]

FAIL - Approach volume less than 100 for one lane approach.

**Signal Warrant Rule #3:** [approach count=4][total volume=565]

FAIL - Total volume less than 650 for intersection with less than four approaches.

### Approach [Westbound] [lanes=1] [control=Stop Sign]

**Signal Warrant Rule #1:** [vehicle-hours=0.1]

FAIL - Vehicle-hours less than 4 for one lane approach.

**Signal Warrant Rule #2:** [approach volume=30]

FAIL - Approach volume less than 100 for one lane approach.

**Signal Warrant Rule #3:** [approach count=4][total volume=565]

FAIL - Total volume less than 650 for intersection with less than four approaches.

---

**SIGNAL WARRANT DISCLAIMER**

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**Peak Hour Volume Signal Warrant Report [Urban]**

### Intersection #1 Park Blvd & Sherman Ave

---

**Future Volume Alternative:** Peak Hour Warrant NOT Met

---

<table>
<thead>
<tr>
<th>Movement</th>
<th>North Bound</th>
<th>South Bound</th>
<th>East Bound</th>
<th>West Bound</th>
</tr>
</thead>
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<tr>
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<td>L - T - R</td>
<td>L - T - R</td>
<td>L - T - R</td>
<td>L - T - R</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Control</th>
<th>Uncontrolled</th>
<th>Uncontrolled</th>
<th>Stop Sign</th>
<th>Stop Sign</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lanes</td>
<td>0 0 1! 0 0 0 0 1! 0 0 0 0 1! 0 0 0 1! 0 0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Initial Vol</td>
<td>62 170 10 10 190 21 15 0 57 10 10 10</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Major Street Volume:** 463

**Minor Approach Volume:** 72

**Minor Approach Volume Threshold:** 425

---

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# Level Of Service Computation Report

**2000 HCM Operations (Future Volume Alternative)**

**Cumulative AM**

## Intersection #2: Park Blvd & Page Mill Rd

### Final Vol: 260

- **Lanes:** 1 0 0
- **Signal:** Split/Rights=Overlap

### Final Vol: 130

- **Lanes:** 0 0 1
- **Signal:** Protect

### Final Vol: 60

- **Lanes:** 0 0 1
- **Signal:** Split/Rights=Include

### Street Name:
- **Park Blvd**
- **Page Mill Rd**

### Approach:
- **North Bound**
- **South Bound**
- **East Bound**
- **West Bound**

### Movement:

<table>
<thead>
<tr>
<th>Min. Green</th>
<th>Y+R</th>
<th>Volume Module</th>
<th>Saturation Flow Module</th>
<th>Capacity Analysis Module</th>
</tr>
</thead>
<tbody>
<tr>
<td>L - T - R</td>
<td>L - T - R</td>
<td>L - T - R</td>
<td>L - T - R</td>
<td>L - T - R</td>
</tr>
<tr>
<td>7 10 10</td>
<td>4.0 4.0</td>
<td>Base Vol:</td>
<td>190 170</td>
<td>1900 1900</td>
</tr>
<tr>
<td>7 10 10</td>
<td>4.0 4.0</td>
<td>Growth Adj:</td>
<td>1.00 1.00</td>
<td>0.89 0.97</td>
</tr>
<tr>
<td>7 10 10</td>
<td>4.0 4.0</td>
<td>Initial Bse:</td>
<td>190 170</td>
<td>0.89 0.97</td>
</tr>
<tr>
<td>7 10 10</td>
<td>4.0 4.0</td>
<td>Added Vol:</td>
<td>0 0 0</td>
<td>0.89 0.97</td>
</tr>
<tr>
<td>7 10 10</td>
<td>4.0 4.0</td>
<td>PasserByVol:</td>
<td>0 0 0</td>
<td>0.89 0.97</td>
</tr>
<tr>
<td>7 10 10</td>
<td>4.0 4.0</td>
<td>Initial Fut:</td>
<td>190 170</td>
<td>0.89 0.97</td>
</tr>
<tr>
<td>7 10 10</td>
<td>4.0 4.0</td>
<td>User Adj:</td>
<td>1.00 1.00</td>
<td>0.89 0.97</td>
</tr>
<tr>
<td>7 10 10</td>
<td>4.0 4.0</td>
<td>PHE Volume:</td>
<td>190 170</td>
<td>0.89 0.97</td>
</tr>
<tr>
<td>7 10 10</td>
<td>4.0 4.0</td>
<td>Reductions Vol:</td>
<td>190 170</td>
<td>0.89 0.97</td>
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<tr>
<td>7 10 10</td>
<td>4.0 4.0</td>
<td>PCE Adj:</td>
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<tr>
<td>7 10 10</td>
<td>4.0 4.0</td>
<td>Reduct Vol:</td>
<td>190 170</td>
<td>0.89 0.97</td>
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<tr>
<td>7 10 10</td>
<td>4.0 4.0</td>
<td>MLP Adj:</td>
<td>1.00 1.00</td>
<td>0.89 0.97</td>
</tr>
<tr>
<td>7 10 10</td>
<td>4.0 4.0</td>
<td>Final Volume:</td>
<td>190 170</td>
<td>0.89 0.97</td>
</tr>
</tbody>
</table>

### Note:
- Queue reported is the number of cars per lane.

---

**HCM2kAvgQ:** 9 9 9 8 8 7 5 3 3 0 1 1
Level Of Service Computation Report
2000 HCM Operations (Future Volume Alternative)
Cumulative+Project AM

Intersection #2: Park Blvd & Page Mill Rd

Street Name:           Park Blvd                        Page Mill Rd
Approach:  North Bound      South Bound       East Bound       West Bound
Movement:          L - T - R          L - T - R          L - T - R          L - T - R
--------------------|------------------|------------------|------------------|------------------|
Min. Green:          7 10 10 10                     7 10 10 10        7 10 10 10        7 10 10 10
Y+R:                 4.0 4.0 4.0 4.0            4.0 4.0 4.0 4.0    4.0 4.0 4.0 4.0    4.0 4.0 4.0 4.0
--------------------|------------------|------------------|------------------|------------------|
Volume Module:
Base Vol:    190 170 10 20 270 260 130 30 60 10 10 10 10
Growth Adj:  1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse: 190 170 10 20 270 260 130 30 60 10 10 10 10
Added Vol:  0 0 0 0 0 0 0 0 14 2 0 0 0 0
PasserByVol: 0 0 0 0 0 0 0 0 0 0 0 0 0 0
Initial Fut: 190 170 10 20 270 274 132 30 60 10 10 10 10
User Adj:  1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Volume:  190 170 10 20 270 274 132 30 60 10 10 10 10
Reduced Vol: 0 0 0 0 0 0 0 0 0 0 0 0 0 0
Final Volume: 190 170 10 20 270 274 132 30 60 10 10 10 10
--------------------|------------------|------------------|------------------|------------------|
Saturation Flow Module:
Sat/Lane:    1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900
Adjustment: 0.89 0.97 0.88 0.92 1.00 0.63 0.88 0.90 0.80 0.88 0.93 0.64
Lanes:      0.53 0.44 0.03 0.07 0.93 1.00 1.00 0.31 0.69 1.00 0.41 0.59
Final Sat.: 905 810 48 130 1753 1205 1663 525 1049 1663 719 719
--------------------|------------------|------------------|------------------|------------------|
Capacity Analysis Module:
Vol/Sat:  0.21 0.21 0.21 0.15 0.15 0.23 0.08 0.06 0.06 0.01 0.01 0.01
Crit Moves: **** ****** ****** **** ****** ****** ****** ****** ****** ****** ****** ******
Green Time: 32.2 32.2 32.2 23.6 23.6 35.8 12.2 13.0 13.0 9.1 10.0 10.0
Volume/Cap: 0.59 0.59 0.59 0.59 0.59 0.59 0.59 0.39 0.39 0.06 0.13 0.13
Uniform Del: 23.5 23.5 23.5 28.9 28.9 21.1 36.5 34.9 34.9 36.6 36.1 36.1
IncrementDel: 1.4 1.4 1.4 1.8 1.8 1.7 4.0 1.1 1.1 0.1 0.4 0.4
InitQueueDel: 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0
Delay Adj:  1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Delay/Veh:  24.9 24.9 24.9 30.8 30.8 22.8 40.5 36.0 36.0 36.7 36.4 36.4
User Del/Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
AdjDelay/Veh: 24.9 24.9 24.9 30.8 30.8 22.8 40.5 36.0 36.0 36.7 36.4 36.4
LOS by Move:    C    C     C     C    C    C+    D+    D+    D+    D+    D+    D+
HCM2kAvgQ:  9 9 9 8 8 7 5 3 3 0 1 1
Note: Queue reported is the number of cars per lane.
Intersection #3: Birch St & Sherman Ave

Level Of Service Computation Report
2000 HCM 4-Way Stop (Future Volume Alternative)
Cumulative AM

Street Name: Birch St & Sherman Ave

Approach: North Bound South Bound East Bound West Bound
Movement: L - T - R L - T - R L - T - R L - T - R

Min. Green: 7 10 10 7 10 10 7 10 10 7 10 10

Volume Module:
Base Vol: 90 400 50 40 20 20 20 60 10 10 40 20
Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse: 90 400 50 40 20 20 20 60 10 10 40 20
Added Vol: 0 0 0 0 0 0 0 0 0 0 0 0
PasserByVol: 0 0 0 0 0 0 0 0 0 0 0 0
Initial Fut: 90 400 50 40 20 20 20 60 10 10 40 20
User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Volume: 90 400 50 40 20 20 20 60 10 10 40 20
Reduct Vol: 0 0 0 0 0 0 0 0 0 0 0 0
Reduced Vol: 90 400 50 40 20 20 20 60 10 10 40 20
PCE Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
MLF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
FinalVolume: 90 400 50 40 20 20 20 60 10 10 40 20

Saturation Flow Module:
Adjustment: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Lanes: 0.33 1.48 0.19 1.00 0.50 0.50 0.22 0.67 0.11 0.14 0.57 0.29
Final Sat.: 229 1052 135 584 339 339 142 427 71 93 370 185

Capacity Analysis Module:
Vol/Sat: 0.39 0.38 0.37 0.07 0.06 0.06 0.14 0.14 0.14 0.11 0.11 0.11
Crit Moves: **** **** **** ****
Delay/Veh: 11.1 10.7 10.3 9.1 8.1 8.1 9.1 9.1 9.1 8.8 8.8 8.8
Delay Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
AdjDel/Veh: 11.1 10.7 10.3 9.1 8.1 8.1 9.1 9.1 9.1 8.8 8.8 8.8
LOS by Move: B B A A A A A A A A A A
ApproachDel: 10.7 8.6 9.1 8.8
Delay Adj: 1.00 1.00 1.00 1.00
ApprAdjDel: 10.7 8.6 9.1 8.8
LOS by Appr: B A A A
AllWayAvgQ: 0.6 0.6 0.6 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1

Note: Queue reported is the number of cars per lane.

Peak Hour Volume Signal Warrant Report [Urban]

Intersection #3 Birch St & Sherman Ave
Future Volume Alternative: Peak Hour Warrant NOT Met

<table>
<thead>
<tr>
<th>Approach:</th>
<th>North Bound</th>
<th>South Bound</th>
<th>East Bound</th>
<th>West Bound</th>
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</thead>
<tbody>
<tr>
<td>Movement:</td>
<td>L - T - R</td>
<td>L - T - R</td>
<td>L - T - R</td>
<td>L - T - R</td>
</tr>
<tr>
<td>Control:</td>
<td>Stop Sign</td>
<td>Stop Sign</td>
<td>Stop Sign</td>
<td>Stop Sign</td>
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<tr>
<td>Lanes:</td>
<td>0 1 0 1 0</td>
<td>0 1 0 1 0</td>
<td>0 0 1 0 0</td>
<td>0 0 1 0 0</td>
</tr>
<tr>
<td>Initial Vol:</td>
<td>90 400 50</td>
<td>40 20 20</td>
<td>20 60 10</td>
<td>10 40 20</td>
</tr>
</tbody>
</table>

Major Street Volume: 620

Minor Approach Volume: 90

Minor Approach Volume Threshold: 450

SIGNAL WARRANT DISCLAIMER

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Level Of Service Computation Report
2000 HCM 4-Way Stop (Future Volume Alternative)
Cumulative+Project AM

Intersection #3: Birch St & Sherman Ave

Street Name:
Birch St                                    Sherman Ave

Approach:  North Bound  South Bound  East Bound  West Bound
Movement:  L - T - R                L - T - R                L - T - R                L - T - R

Min. Green:  7 10 10 10 7 10 10 7 10 10

Volume Module:
Base Vol:  90 400 50 40 20 20 40 60 10 10 40 20
Growth Adj:  1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse:  90 400 50 40 20 20 40 60 10 10 40 20
Added Vol:  0 4 16 13 7 11 8 17 3 6 22 6
PasserByVol:  0 0 0 0 0 0 0 0 0 0 0 0
Initial Fut:  90 404 66 53 27 31 28 77 13 16 62 26
User Adj:  1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj:  1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Volume:  90 404 66 53 27 31 28 77 13 16 62 26
Reducut Vol:  0 0 0 0 0 0 0 0 0 0 0 0
Critical V/C:  0.426 62

FinalVolume:  90 404 66 53 27 31 28 77 13 16 62 26

Saturation Flow Module:
Lanes: 0.32 1.44 0.24 0.95 0.49 0.56 0.24 0.65 0.11 0.15 0.60 0.25
Final Sat.:  211 981 165 533 309 360 146 401 68 96 370 155

Capacity Analysis Module:
Vol/Sat: 0.43 0.41 0.40 0.10 0.09 0.09 0.19 0.19 0.19 0.17 0.17 0.17
Crit Moves: ****  ****  ****  ****

Delay/Veh: 11.9 11.4 11.0 9.5 8.6 8.5 9.7 9.7 9.7 9.4 9.4 9.4
Delay Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
AdjDel/Veh: 11.9 11.4 11.0 9.5 8.6 8.5 9.7 9.7 9.7 9.4 9.4 9.4

LOS by Move: B  B  B  A  A  A  A  A  A  A  A  A
ApproachDel: 11.5 9.0 9.7 9.4
Delay Adj: 1.00 1.00 1.00 1.00
ApprAdjDel: 11.5 9.0 9.7 9.4

Loss Time (sec): 0

Note: Queue reported is the number of cars per lane.

Peak Hour Volume Signal Warrant Report [Urban]

Intersection #3 Birch St & Sherman Ave
**Future Volume Alternative: Peak Hour Warrant NOT Met**

<table>
<thead>
<tr>
<th>Approach:</th>
<th>North Bound</th>
<th>South Bound</th>
<th>East Bound</th>
<th>West Bound</th>
</tr>
</thead>
<tbody>
<tr>
<td>Movement:</td>
<td>L - T - R</td>
<td>L - T - R</td>
<td>L - T - R</td>
<td>L - T - R</td>
</tr>
<tr>
<td>Control:</td>
<td>Stop Sign</td>
<td>Stop Sign</td>
<td>Stop Sign</td>
<td>Stop Sign</td>
</tr>
<tr>
<td>Lanes:</td>
<td>0 1 0 1 0</td>
<td>0 1 0 1 0</td>
<td>0 0 1 0 0</td>
<td>0 0 1 0 0</td>
</tr>
<tr>
<td>Initial Vol:</td>
<td>90 404 66</td>
<td>53 27 31</td>
<td>28 77 13</td>
<td>16 62 26</td>
</tr>
</tbody>
</table>

**Major Street Volume:** 671

**Minor Approach Volume:** 118

**Minor Approach Volume Threshold:** 422

**SIGNAL WARRANT DISCLAIMER**

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### Level Of Service Computation Report
2000 HCM Unsignalized (Future Volume Alternative)
Cumulative AM

#### Intersection #4: Birch St & Grant Ave

**Final Vol:**
- **Lanes:** 0 1 0 1 0
- **Vol Cnt Date:** n/a
- **Cycle Time (sec):** 100
- **Loss Time (sec):** 0
- **Critical V/C:** 0.150
- **Avg Crit Del (sec/veh):** 2.9
- **Avg Delay (sec/veh):** 2.9
- **LOS:** C

**Street Name:** Birch St & Grant Ave

<table>
<thead>
<tr>
<th>Approach</th>
<th>North Bound</th>
<th>South Bound</th>
<th>East Bound</th>
<th>West Bound</th>
</tr>
</thead>
<tbody>
<tr>
<td>Movement</td>
<td>L - T - R</td>
<td>L - T - R</td>
<td>L - T - R</td>
<td>L - T - R</td>
</tr>
</tbody>
</table>

**Volume Module:**
- **Base Vol:** 50 490 50 20 40 20 40 50 20 0 0 0
- **Growth Adj:** 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
- **Initial Bse:** 50 490 50 20 40 20 40 50 20 0 0 0
- **Added Vol:** 0 0 0 0 0 0 0 0 0 0 0 0
- **PasserByVol:** 0 0 0 0 0 0 0 0 0 0 0 0
- **Initial Fut:** 50 490 50 20 40 20 40 50 20 0 0 0
- **User Adj:** 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
- **PHF Adj:** 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
- **PHF Volume:** 50 490 50 20 40 20 40 50 20 0 0 0
- **Reduct Vol:** 0 0 0 0 0 0 0 0 0 0 0 0
- **FinalVolume:** 50 490 50 20 40 20 40 50 20 0 0 0

**Critical Gap Module:**
- **Critical Gp:** 4.1 xxxx xxxx 3.5 4.0 3.3 xxxx xxxx xxxx
- **FollowUpTim:** 2.2 xxxx xxxx 3.5 4.0 3.3 xxxx xxxx xxxx

**Capacity Module:**
- **Cnflict Vol:** 60 xxxx xxxx 435 730 30 xxxx xxxx xxxx
- **Potent Cap.:** 1556 xxxx xxxx 555 352 1044 xxxx xxxx xxxx
- **Move Cap.:** 1556 xxxx xxxx 532 333 1044 xxxx xxxx xxxx
- **Volume/Cap:** 0.03 xxxx xxxx 0.08 0.15 0.02 xxxx xxxx xxxx

**Level Of Service Module:**
- **2Way95thQ:** 0.1 xxxx xxxx 0.1 xxxx xxxx 0.9 xxxx xxxx 15.6 xxxx xxxx xxxx
- **Control Del:** 7.4 xxxx xxxx 8.5 xxxx xxxx 8.5 xxxx xxxx 8.5 xxxx xxxx

---

**Peak Hour Delay Signal Warrant Report**

Intersection #4 Birch St & Grant Ave

Future Volume Alternative: Peak Hour Warrant NOT Met
Approach: North Bound | South Bound | East Bound | West Bound
Movement: L - T - R | L - T - R | L - T - R | L - T - R

Control: Uncontrolled | Uncontrolled | Stop Sign | Stop Sign
Lanes: 0 1 0 1 0 | 0 1 0 1 0 | 0 0 1 0 0 | 0 0 0 0 0
Initial Vol: 50 490 50 | 20 40 20 | 40 50 20 | 0 0 0 0 0
Approach Del: xxxxxx | xxxxxx | 15.6 | xxxxxx

Approach [eastbound] [lanes=1] [control=Stop Sign]
Signal Warrant Rule #1: [vehicle-hours=0.5]
FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=110]
SUCCEED - Approach volume greater than or equal to 100 for one lane approach.
Signal Warrant Rule #3: [approach count=3] [total volume=780]
SUCCEED - Total volume greater than or equal to 650 for intersection with less than four approaches.

SIGNAL WARRANT DISCLAIMER
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Intersection #4 Birch St & Grant Ave

Future Volume Alternative: Peak Hour Warrant NOT Met

Approach: North Bound | South Bound | East Bound | West Bound
Movement: L - T - R | L - T - R | L - T - R | L - T - R
Control: Uncontrolled | Uncontrolled | Stop Sign | Stop Sign
Lanes: 0 1 0 1 0 | 0 1 0 1 0 | 0 0 1 0 0 | 0 0 0 0 0
Initial Vol: 50 490 50 | 20 40 20 | 40 50 20 | 0 0 0 0 0
Major Street Volume: 670
Minor Approach Volume: 110
Minor Approach Volume Threshold: 423

SIGNAL WARRANT DISCLAIMER
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Level Of Service Computation Report
2000 HCM Unsignalized (Future Volume Alternative)
Cumulative+Project AM

Intersection #4: Birch St & Grant Ave

Street Name: Birch St & Grant Ave
Approach: North Bound South Bound East Bound West Bound
Movement: L - T - R L - T - R L - T - R L - T - R

Volume Module:
Base Vol: 50 490 50 20 40 20 40 50 20 0 0 0
Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse: 50 490 50 20 40 20 40 50 20 0 0 0
Added Vol: 0 20 0 2 11 0 0 0 0 0 0 0
PasserByVol: 0 0 0 0 0 0 0 0 0 0 0 0
Initial Fut: 50 510 50 22 51 20 40 50 20 0 0 0
User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Volume: 50 510 50 22 51 20 40 50 20 0 0 0
Reduc Vol: 0 0 0 0 0 0 0 0 0 0 0 0
FinalVolume: 50 510 50 22 51 20 40 50 20 0 0 0

Critical Gap Module:
Critical Gp: 4.1 xxxx xxxx x 6.8 6.5 6.9 xxxx xxxx xxxx
FollowUpTim: 2.2 xxxx xxxx xxxx 3.5 4.0 3.3 xxxx xxxx xxxx

Capacity Module:
Cnflict Vol: 71 xxxx xxxx 560 xxxx xxxx 460 765 36 xxxx xxxx xxxx
Potent Cap.: 1542 xxxx xxxx 1021 xxxx xxxx 535 336 1036 xxxx xxxx xxxx
Move Cap.: 1542 xxxx xxxx 1021 xxxx xxxx 512 317 1036 xxxx xxxx xxxx
Volume/Cap: 0.03 xxxx xxxx 0.02 xxxx xxxx 0.08 0.16 0.02 xxxx xxxx xxxx

Level Of Service Module:
2Way95thQ: 0.1 xxxx xxxx 0.1 xxxx xxxx xxxx xxxx xxxx xxxx xxxx
Control Del: 7.4 xxxx xxxx 8.6 xxxx xxxx xxxx xxxx xxxx xxxx xxxx
LOS by Move: A * A * A * * * * *
Movement: LT - LTR - RT LT - LTR - RT LT - LTR - RT LT - LTR - RT
Shared Cap.: xxxx xxxx xxxx xxxx xxxx xxxx xxxx xxxx 431 xxxx xxxx xxxx xxxx
SharedQueue: 0.1 xxxx xxxx 0.1 xxxx xxxx 1.0 xxxx xxxx xxxx xxxx
Shrd ConDel: 7.4 xxxx xxxx 8.6 xxxx xxxx xxxx 16.2 xxxx xxxx xxxx xxxx
Shared LOS: A * A * * * C * * *
ApproachDel: xxxxxx xxxxxx 16.2 xxxxxx
ApproachLOS: * C

Note: Queue reported is the number of cars per lane.

Peak Hour Delay Signal Warrant Report
### Approach: Birch St & Grant Ave

**Future Volume Alternative: Peak Hour Warrant NOT Met**

<table>
<thead>
<tr>
<th>Approach</th>
<th>North Bound</th>
<th>South Bound</th>
<th>East Bound</th>
<th>West Bound</th>
</tr>
</thead>
<tbody>
<tr>
<td>Movement</td>
<td>L - T - R</td>
<td>L - T - R</td>
<td>L - T - R</td>
<td>L - T - R</td>
</tr>
<tr>
<td>Control</td>
<td>Uncontrolled</td>
<td>Uncontrolled</td>
<td>Stop Sign</td>
<td>Stop Sign</td>
</tr>
<tr>
<td>Lanes</td>
<td>0 1 0 1 0</td>
<td>0 1 0 1 0</td>
<td>0 0 1 0 0</td>
<td>0 0 0 0 0</td>
</tr>
<tr>
<td>Initial Vol</td>
<td>50 510 50</td>
<td>22 51 20</td>
<td>40 50 20</td>
<td>0 0 0 0 0</td>
</tr>
<tr>
<td>ApproachDel</td>
<td>xxxxxx</td>
<td>xxxxxx</td>
<td>16.2</td>
<td>xxxxxx</td>
</tr>
</tbody>
</table>

**Major Street Volume:** 703

**Minor Approach Volume:** 110

**Minor Approach Volume Threshold:** 406

**SIGNAL WARRANT DISCLAIMER**

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Level Of Service Computation Report
2000 HCM Unsignalized (Future Volume Alternative)
Cumulative AM

Intersection #5: Birch St & Sheridan Ave

<table>
<thead>
<tr>
<th>Movement</th>
<th>North Bound</th>
<th>South Bound</th>
<th>East Bound</th>
<th>West Bound</th>
</tr>
</thead>
<tbody>
<tr>
<td>Movement:</td>
<td>L - T - R</td>
<td>L - T - R</td>
<td>L - T - R</td>
<td>L - T - R</td>
</tr>
<tr>
<td>Base Vol:</td>
<td>170 560 300</td>
<td>30 20 10</td>
<td>10 50 10 20 20 10</td>
<td></td>
</tr>
<tr>
<td>Growth Adj:</td>
<td>1.00 1.00 1.00</td>
<td>1.00 1.00 1.00</td>
<td>1.00 1.00 1.00</td>
<td>1.00 1.00 1.00</td>
</tr>
<tr>
<td>Initial Bse:</td>
<td>170 560 300</td>
<td>30 20 10</td>
<td>10 50 10 20 20 10</td>
<td></td>
</tr>
<tr>
<td>Added Vol:</td>
<td>0 0 0</td>
<td>0 0 0</td>
<td>0 0 0</td>
<td>0 0 0</td>
</tr>
<tr>
<td>PasserByVol:</td>
<td>0 0 0</td>
<td>0 0 0</td>
<td>0 0 0</td>
<td>0 0 0</td>
</tr>
<tr>
<td>Initial Fut:</td>
<td>170 560 300</td>
<td>30 20 10</td>
<td>10 50 10 20 20 10</td>
<td></td>
</tr>
<tr>
<td>User Adj:</td>
<td>1.00 1.00 1.00</td>
<td>1.00 1.00 1.00</td>
<td>1.00 1.00 1.00</td>
<td>1.00 1.00 1.00</td>
</tr>
<tr>
<td>PHF Adj:</td>
<td>1.00 1.00 1.00</td>
<td>1.00 1.00 1.00</td>
<td>1.00 1.00 1.00</td>
<td>1.00 1.00 1.00</td>
</tr>
<tr>
<td>PHF Volume:</td>
<td>170 560 300</td>
<td>30 20 10</td>
<td>10 50 10 20 20 10</td>
<td></td>
</tr>
<tr>
<td>Reduct Vol:</td>
<td>0 0 0</td>
<td>0 0 0</td>
<td>0 0 0</td>
<td>0 0 0</td>
</tr>
<tr>
<td>FinalVolume:</td>
<td>170 560 300</td>
<td>30 20 10</td>
<td>10 50 10 20 20 10</td>
<td></td>
</tr>
</tbody>
</table>

Note: Queue reported is the number of cars per lane.
Approach: | North Bound | South Bound | East Bound | West Bound
Movement: | L - T - R | L - T - R | L - T - R | L - T - R
Control: | Uncontrolled | Uncontrolled | Stop Sign | Stop Sign
Lanes: | 0 0 1! 0 0 | 0 1 0 1 0 | 0 0 1! 0 0 | 0 0 1! 0 0
Initial Vol: | 170 560 300 | 30 20 10 | 10 50 10 | 20 20 10
ApproachDel: | xxxxxx | xxxx | 43.7 | 37.8

Approach [eastbound] [lanes=1] [control=Stop Sign]
Signal Warrant Rule #1: [vehicle-hours=0.8]
FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=70]
FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=4] [total volume=1210]
SUCCEED - Total volume greater than or equal to 800 for intersection with four or more approaches.

Approach [westbound] [lanes=1] [control=Stop Sign]
Signal Warrant Rule #1: [vehicle-hours=0.5]
FAIL - Vehicle-hours less than 4 for one lane approach.
Signal Warrant Rule #2: [approach volume=50]
FAIL - Approach volume less than 100 for one lane approach.
Signal Warrant Rule #3: [approach count=4] [total volume=1210]
SUCCEED - Total volume greater than or equal to 800 for intersection with four or more approaches.

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Intersection #5: Birch St & Sheridan Ave

Signal=Uncontrol/Rights=Include

Vol Cnt Date: n/a

Cycle Time (sec): 100

Loss Time (sec): 0

Critical V/C: 0.371

Avg Crit Del (sec/veh): 5.5

Avg Delay (sec/veh): 5.5

LOS: E

Street Name: Birch St

Approach: North Bound South Bound East Bound West Bound

Movement: L - T - R L - T - R L - T - R L - T - R

Volume Module:

Base Vol: 170 560 300 30 20 10 10 50 10 20 20 10

Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00

Initial Bse: 170 560 300 30 20 10 10 50 10 20 20 10

Added Vol: 0 20 0 0 11 0 0 0 0 0 0 0

PasserByVol: 0 0 0 0 0 0 0 0 0 0 0 0

Initial Fut: 170 580 300 30 31 10 10 50 10 20 20 10

User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00

PHF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00

PHF Volume: 170 580 300 30 31 10 10 50 10 20 20 10

Reduct Vol: 0 0 0 0 0 0 0 0 0 0 0 0

FinalVolume: 170 580 300 30 31 10 10 50 10 20 20 10

Critical Gap Module:

Critical Gp: 4.1 xxxx xxxxx 4.1 xxxx xxxxx 7.1 6.5 6.2 7.1 6.5 6.2

FollowUpTim: 2.2 xxxx xxxxx 2.2 xxxx xxxxx 3.5 4.0 3.3 3.5 4.0 3.3

Capacity Module:

Conflict Vol: 41 xxxx xxxxx 880 xxxx xxxxx 1181 1316 21 1171 1171 730

Potent Cap.: 1581 xxxx xxxxx 777 xxxx xxxxx 168 159 1063 171 194 426

Move Cap.: 1581 xxxx xxxxx 777 xxxx xxxxx 132 135 1063 107 164 426

Volume/Cap.: 0.11 xxxx xxxxx 0.04 xxxx xxxxx 0.08 0.37 0.01 0.19 0.12 0.02

Level Of Service Module:

2Way95thQ: 0.4 xxxx xxxxx 0.1 xxxx xxxxx xxxx xxxx xxxx xxxx xxxx xxxx xxxx xxxx

Control Del: 7.6 xxxx xxxxx 9.8 xxxx xxxxx xxxx xxxx xxxx xxxx xxxx xxxx xxxx

LOS by Move: A * * A * * * * * * * * * * * * * *

Movement: LT - LTR - RT LT - LTR - RT LT - LTR - RT LT - LTR - RT

Shared Cap.: xxxx xxxx xxxx xxxx xxxx xxxx xxxx xxxx 153 xxxx xxxx 151 xxxx

SharedQueue:xxxx xxxxx 0.1 xxxx xxxxx xxxx xxxx xxxx 2.1 xxxx xxxx 1.3 xxxx

Share ConDel:xxxx xxxx xxxx 9.8 xxxx xxxx xxxx 46.8 xxxx xxxx 40.3 xxxx

Shared LOS: A * * A * * * E * * E *

ApproachDel: xxxxx xxxxx 46.8 40.3

ApproachLOS: E E

Note: Queue reported is the number of cars per lane.

Peak Hour Delay Signal Warrant Report

Intersection #5 Birch St & Sheridan Ave

Future Volume Alternative: Peak Hour Warrant NOT Met
Approach: | North Bound | South Bound | East Bound | West Bound |
---|---|---|---|---|
Movement: | L - T - R | L - T - R | L - T - R | L - T - R |
Control: | Uncontrolled | Uncontrolled | Stop Sign | Stop Sign |
Lanes: | 0 1 0 1 0 0 0 1 0 0 0 1 0 0 0 0 1 0 0 |
Initial Vol: | 170 580 300 30 31 10 10 50 10 20 20 10 |
ApproachDel: | xxxxxx | xxxxxx |

**Approach[eastbound][lanes=1][control=Stop Sign]**

Signal Warrant Rule #1: [vehicle-hours=0.9]
FAIL - Vehicle-hours less than 4 for one lane approach.

Signal Warrant Rule #2: [approach volume=70]
FAIL - Approach volume less than 100 for one lane approach.

Signal Warrant Rule #3: [approach count=4][total volume=1241]
SUCCEED - Total volume greater than or equal to 800 for intersection with four or more approaches.

**Approach[westbound][lanes=1][control=Stop Sign]**

Signal Warrant Rule #1: [vehicle-hours=0.6]
FAIL - Vehicle-hours less than 4 for one lane approach.

Signal Warrant Rule #2: [approach volume=50]
FAIL - Approach volume less than 100 for one lane approach.

Signal Warrant Rule #3: [approach count=4][total volume=1241]
SUCCEED - Total volume greater than or equal to 800 for intersection with four or more approaches.

**SIGNAL WARRANT DISCLAIMER**

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**Intersection #5 Birch St & Sheridan Ave**

Major Street Volume: 1121
Minor Approach Volume: 70

**SIGNAL WARRANT DISCLAIMER**

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**Level Of Service Computation Report**

**2000 HCM 4-Way Stop (Future Volume Alternative)**

**Cumulative AM**

### Intersection #6: Ash St & California Ave

**Street Name:**

<table>
<thead>
<tr>
<th>Approach</th>
<th>Ash St</th>
<th>California Ave</th>
</tr>
</thead>
<tbody>
<tr>
<td>Movement</td>
<td>L</td>
<td>T</td>
</tr>
<tr>
<td>Min. Green</td>
<td>7 10 10</td>
<td>7 10 10</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Volume Module</th>
</tr>
</thead>
<tbody>
<tr>
<td>Base Vol: 50</td>
</tr>
<tr>
<td>Growth Adj: 1.00</td>
</tr>
<tr>
<td>Initial Bse: 50</td>
</tr>
<tr>
<td>Added Vol: 0</td>
</tr>
<tr>
<td>PasserByVol: 0</td>
</tr>
<tr>
<td>Initial Fut: 50</td>
</tr>
<tr>
<td>User Adj: 1.00</td>
</tr>
<tr>
<td>PHE Volume: 50</td>
</tr>
<tr>
<td>Reduct Vol: 0</td>
</tr>
<tr>
<td>Reduced Vol: 50</td>
</tr>
<tr>
<td>PCE Adj: 1.00</td>
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<td>FinalVolume: 50</td>
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<thead>
<tr>
<th>Saturation Flow Module</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adjustment: 1.00</td>
</tr>
<tr>
<td>Lanes: 0.56</td>
</tr>
<tr>
<td>Final Sat.: 418</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Capacity Analysis Module</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vol/Sat: 0.12</td>
</tr>
<tr>
<td>Crit Moves: ****</td>
</tr>
<tr>
<td>Delay/Veh: 8.1</td>
</tr>
<tr>
<td>Delay Adj: 1.00</td>
</tr>
<tr>
<td>AdjDel/Veh: 8.1</td>
</tr>
<tr>
<td>LOS by Move: A</td>
</tr>
<tr>
<td>ApproachDel: 8.1</td>
</tr>
<tr>
<td>Delay Adj: 1.00</td>
</tr>
<tr>
<td>ApprAdjDel: 8.1</td>
</tr>
<tr>
<td>LOS by Appr: A</td>
</tr>
<tr>
<td>AllWayAvgQ: 0.1</td>
</tr>
</tbody>
</table>

**Note:** Queue reported is the number of cars per lane.

---

**Peak Hour Volume Signal Warrant Report [Urban]**

**Intersection #6 Ash St & California Ave**

---
Future Volume Alternative: Peak Hour Warrant NOT Met

<table>
<thead>
<tr>
<th>Approach:</th>
<th>North Bound</th>
<th>South Bound</th>
<th>East Bound</th>
<th>West Bound</th>
</tr>
</thead>
<tbody>
<tr>
<td>Movement:</td>
<td>L - T - R</td>
<td>L - T - R</td>
<td>L - T - R</td>
<td>L - T - R</td>
</tr>
<tr>
<td>Control:</td>
<td>Stop Sign</td>
<td>Stop Sign</td>
<td>Stop Sign</td>
<td>Stop Sign</td>
</tr>
<tr>
<td>Lanes:</td>
<td>0 0 1! 0 0 0 0 0 0 0 0 0 0 1 0 1 0 1 0 0 0 0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Initial Vol:</td>
<td>50 0 40 0 0 0 0 0 100 40 20 200 0</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Major Street Volume: 360
Minor Approach Volume: 90
Minor Approach Volume Threshold: 637

SIGNAL WARRANT DISCLAIMER
This peak hour signal warrant analysis should be considered solely as an "indicator" of the likelihood of an unsignalized intersection warranting a traffic signal in the future. Intersections that exceed this warrant are probably more likely to meet one or more of the other volume based signal warrant (such as the 4-hour or 8-hour warrants).

The peak hour warrant analysis in this report is not intended to replace a rigorous and complete traffic signal warrant analysis by the responsible jurisdiction. Consideration of the other signal warrants, which is beyond the scope of this software, may yield different results.
**Intersection #6: Ash St & California Ave**

<table>
<thead>
<tr>
<th>Movement</th>
<th>North Bound</th>
<th>South Bound</th>
<th>East Bound</th>
<th>West Bound</th>
</tr>
</thead>
<tbody>
<tr>
<td>L - T - R</td>
<td>L - T - R</td>
<td>L - T - R</td>
<td>L - T - R</td>
<td>L - T - R</td>
</tr>
<tr>
<td>Min. Green</td>
<td>7 10 10 7 10 10</td>
<td>7 10 10 7 10 10</td>
<td>7 10 10 7 10 10</td>
<td>7 10 10 7 10 10</td>
</tr>
</tbody>
</table>

**Volume Module:**
- **Base Vol:** 50 0 40 0 0 0 100 40 20 200 0
- **User Adj:** 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
- **PHF Adj:** 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
- **MLF Adj:** 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
- **Final Volume:** 53 0 40 0 0 0 116 40 20 217 0

**Saturation Flow Module:**
- **Lanes:** 0.57 0.00 0.43 0.00 0.00 0.00 1.00 1.00 0.08 0.92 0.00
- **Final Sat.:** 419 0 316 0 0 0 723 841 68 737 0

**Capacity Analysis Module:**
- **Vol/Sat:** 0.13 xxxx 0.13 xxxx xxxx xxxx xxxx 0.16 0.05 0.29 0.29 xxxx
- **Delay/Veh:** 8.2 0.0 8.2 0.0 0.0 0.0 8.5 7.1 9.2 9.2 0.0
- **Delay Adj:** 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
- **AdjDel/Veh:** 8.2 0.0 8.2 0.0 0.0 0.0 8.5 7.1 9.2 9.2 0.0
- **Approach Del:** A * A * A A A A A A A A A
- **Delay Adj:** 1.00 xxxx 1.00 1.00
- **AllWayAvgQ:** 0.1 0.1 0.0 0.0 0.0 0.0 0.2 0.0 0.4 0.4 0.4 0.4

**Note:** Queue reported is the number of cars per lane.

*Peak Hour Volume Signal Warrant Report [Urban]*

---

**Street Name:**
- Ash St
- California Ave

**Approach Del:**
- A * A * A A A A A A A A A

**AllWayAvgQ:** 0.1 0.1 0.0 0.0 0.0 0.0 0.2 0.0 0.4 0.4 0.4 0.4

---

**Note:** Queue reported is the number of cars per lane.

---

**Level Of Service Computation Report**

*2000 HCM 4-Way Stop (Future Volume Alternative)*

*Cummulative+Project AM*
Future Volume Alternative: Peak Hour Warrant NOT Met

Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
Control:        Stop Sign        Stop Sign        Stop Sign        Stop Sign
Lanes:        0  0  1! 0  0    0  0  0  0    0  0  1  0  1    0  1  0  0  0
Initial Vol:   53    0    40     0    0     0     0  116    40    20  217     0

Major Street Volume:             393
Minor Approach Volume:           93
Minor Approach Volume Threshold: 607

SIGNAL WARRANT DISCLAIMER
This peak hour signal warrant analysis should be considered solely as an
"indicator" of the likelihood of an unsignalized intersection warranting
a traffic signal in the future. Intersections that exceed this warrant
are probably more likely to meet one or more of the other volume based
signal warrant (such as the 4-hour or 8-hour warrants).

The peak hour warrant analysis in this report is not intended to replace
a rigorous and complete traffic signal warrant analysis by the responsible
jurisdiction. Consideration of the other signal warrants, which is beyond
the scope of this software, may yield different results.
Level Of Service Computation Report
2000 HCM Operations (Future Volume Alternative)
Cumulative AM

Intersection #7: ECR & Cambridge Ave

Final Vol: 60  1480  60***
Lanes: 0 1 2  0 1

Final Vol: 40  0  0  110***
Lanes: 1 2  0  4  0

Final Vol: 20  1760***
Lanes: 0 2  1  0  30

Signal=Protect/Rights=Include

Street Name:               ECR                          Cambridge Ave
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Min. Green:    7 10 10      7 10 10  7 10 10  7 10 10
Y+R:          4.0 4.0  4.0 4.0  4.0 4.0  4.0 4.0  4.0 4.0  4.0 4.0
------------|---------------||---------------||---------------||---------------|

Volume Module:
Base Vol:      20 1760    30    60 1480    60    40   20    20    40   20   110
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00  1.00 1.00
Initial Bse:   20 1760    30    60 1480    60    40   20    20    40   20   110
Added Vol:      0    0     0     0    0     0     0    0     0     0    0     0
PasserByVol:    0    0     0     0    0     0     0    0     0     0    0     0
Initial Fut:   20 1760    30    60 1480    60    40   20    20    40   20   110
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00  1.00 1.00
PHF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00  1.00 1.00
PHF Volume:    20 1760    30    60 1480    60    40   20    20    40   20   110
Reduced Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Bse:   20 1760    30    60 1480    60    40   20    20    40   20   110
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00  1.00 1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00  1.00 1.00
FinalVolume:   20 1760    30    60 1480    60    40   20    20    40   20   110

Saturation Flow Module:
Sat/Lane:    1900 1900  1900 1900 1900  1900 1900 1900  1900 1900  1900 1900
Adjustment:  0.92 1.00  0.92 0.92 1.00  0.92 0.92 0.92  0.92 0.92  0.92 0.92
Lanes:       1.00 2.95  0.05 1.00 2.87  0.13 0.51 0.23  0.26 0.68  0.32 1.00
Final Sat.:  1750 5596    95  1750 5460   221   893  446   446  1198  599  1750

Capacity Analysis Module:
Vol/Sat:     0.01 0.31  0.31 0.03 0.27  0.27 0.04 0.04  0.04 0.03  0.03 0.06
Crit Moves:       ****       ****
Green Time:  17.2 105 105.4  11.5 99.8  99.8 21.1 21.1  21.1 21.1  21.1
Volume/Cap:  0.10 0.45  0.45 0.45 0.41  0.41 0.32 0.32  0.32 0.24  0.24 0.45
Uniform Del: 59.5  9.7   9.7  66.2 11.5  11.5 58.0 58.0  58.0 57.3 57.3 59.1
IncremmtDel:  0.2  0.1   0.1  2.4  0.1   0.1  0.7  0.7  0.7  0.5  0.5  1.3
InitQueuDel:  0.0  0.0   0.0  0.0  0.0   0.0  0.0  0.0  0.0  0.0  0.0  0.0
Delay Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00  1.00 1.00
Delay/Veh:   59.7  9.7  9.7 68.6 11.6 11.6 58.7 58.7  58.7 57.8 57.8 60.4
User DelAdj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00  1.00 1.00
AdjDel/Veh:  59.7  9.7  9.7 68.6 11.6 11.6 58.7 58.7  58.7 57.8 57.8 60.4
LOS by Move:   E+    A     A     E   B+    B+    E+   E+    E+    E+     E
HCM2kAvgQ:      1   12    12     3   11    11     4   4     4     3    3     5
Note: Queue reported is the number of cars per lane.
Intersection #7: ECR & Cambridge Ave

Street Name: ECR & Cambridge Ave
Approach: North Bound South Bound East Bound West Bound

Movement: L - T - R L - T - R L - T - R L - T - R

Min. Green: 7 10 10 7 10 10 10 7 10 10 7 10 10
Y+R: 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0

Volume Module:
Base Vol: 20 1760 30 60 1480 60 40 20 20 40 20 110
Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse: 20 1760 30 60 1480 60 40 20 20 40 20 110
Added Vol: 0 6 0 0 6 0 0 0 0 0 0 0
PasserByVol: 0 20 0 0 0 0 0 0 0 0 0 0
Initial Fut: 20 1766 30 60 1486 60 40 20 20 40 20 110
User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Volume: 20 1766 30 60 1486 60 40 20 20 40 20 110
Reduct Vol: 0 0 0 0 0 0 0 0 0 0 0 0
Reduced Vol: 20 1766 30 60 1486 60 40 20 20 40 20 110
PCE Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
MLF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
FinalVolume: 20 1766 30 60 1486 60 40 20 20 40 20 110

Saturation Flow Module:
Sat/Lane: 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900
Adjustment: 0.92 1.00 0.92 0.92 1.00 0.92 0.92 1.00 0.92 1.00 0.92 1.00
Lanes: 1.00 2.95 0.05 1.00 2.87 0.13 0.51 0.23 0.26 0.68 0.32 1.00
Final Sat.: 1750 5597 95 1750 5461 220 893 446 446 1198 599 1750

Capacity Analysis Module:
Vol/Sat: 0.01 0.32 0.32 0.03 0.27 0.27 0.04 0.04 0.04 0.03 0.03 0.06
Crit Moves: **** **** ****
Green Time: 17.1 106 105.5 11.5 99.9 99.9 21.0 21.0 21.0 21.0 21.0 21.0
Volume/Cap: 0.10 0.45 0.45 0.45 0.41 0.41 0.32 0.32 0.32 0.24 0.24 0.45
Uniform Del: 59.5 9.6   9.6  66.2  11.5  11.5  58.1  58.1  58.1  57.4  57.4  59.2
IncremntDel: 0.2 0.1   0.1  2.4  0.1  0.1  0.7  0.7  0.7  0.5  0.5  1.3
InitQueuDel: 0.0 0.0   0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0
Delay Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Delay/Veh: 59.8 9.7  9.7  68.6  11.6  11.6  58.8  58.8  58.8  57.9  57.9  60.5
User Del/Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
AdjDel/Veh: 59.8 9.7  9.7  68.6  11.6  11.6  58.8  58.8  58.8  57.9  57.9  60.5
LOS by Move: E+ A A E B+ B+ E+ E+ E+ E+ E+ E
HCM2kAvgQ: 1 12 12 3 11 11 4 4 4 3 3 5

Note: Queue reported is the number of cars per lane.
Intersection #8: ECR & California Ave

Street Name: ECR California Ave
Approach: North Bound South Bound East Bound West Bound
Movement: L - T - R L - T - R L - T - R L - T - R

Min. Green: 7 10 10 7 10 10 7 10 10
Y+R: 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0

Volume Module:
Base Vol: 120 1750 70 80 1240 180 40 40 70 70 80 70
Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse: 120 1750 70 80 1240 180 40 40 70 70 80 70
Added Vol: 0 0 0 0 0 0 0 0 0 0 0 0
PasserByVol: 0 0 0 0 0 0 0 0 0 0 0 0
Initial Fut: 120 1750 70 80 1240 180 40 40 70 70 80 70
User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Volume: 120 1750 70 80 1240 180 40 40 70 70 80 70
Reduced Vol: 120 1750 70 80 1240 180 40 40 70 70 80 70
PCE Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
MLF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
FinalVolume: 120 1750 70 80 1240 180 40 40 70 70 80 70

Saturation Flow Module:
Sat/Lane: 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900
Adjustment: 0.92 1.00 0.92 1.00 0.92 0.92 1.00 0.92 0.92 1.00 0.92 1.00
Lanes: 1.00 2.88 0.12 1.00 2.59 0.41 1.00 0.34 0.66 1.00 1.00 1.00
Final Sat.: 1750 5463 219 1750 4924 715 1750 655 1147 1750 1900 1750

Capacity Analysis Module:
Vol/Sat: 0.07 0.32 0.32 0.05 0.25 0.25 0.02 0.06 0.06 0.04 0.04 0.04
Crit Moves: **** **** **** ****
Green Time: 23.1 94.6 94.6 13.5 85.0 85.0 12.3 18.0 18.0 11.8 17.6 17.6
Volume/Cap: 0.44 0.51 0.51 0.44 0.44 0.44 0.28 0.51 0.51 0.51 0.36 0.34
Uniform Del: 57.6 15.0 15.0 65.1 18.8 18.8 64.7 61.8 61.8 66.3 61.0 60.9
IncremntDel: 1.2 0.1 0.1 2.7 0.1 0.1 1.1 2.0 2.0 3.1 1.0 1.0
InitQueuDel: 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0
Delay Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Delay/Veh: 58.8 15.2 15.2 67.8 19.9 19.9 65.8 63.8 63.8 69.4 62.0 61.9
User DelAdj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
AdjDel/Veh: 58.8 15.2 15.2 67.8 19.9 19.9 65.8 63.8 63.8 69.4 62.0 61.9
LOS by Move: E+ E- B E- B- E E E E E E E E E E
HCM2kAvgQ: 6 15 15 4 12 12 2 5 5 4 4 3

Note: Queue reported is the number of cars per lane.
This page contains a Level Of Service Computation Report for an intersection. The report focuses on an intersection named #8: ECR & California Ave. The report details the operations of the intersection under future volume alternatives, specifically the Cummulative+Project AM scenario.

The report includes
- Traffic volumes
- Cycle times
- Loss times
- Critical V/C
- Average critical delay
- Average delay
- LOS (Level Of Service)

The report also includes details on the movement of vehicles, including
- Approach directions: North Bound, South Bound, East Bound, West Bound
- Minimum green times
- Y+R
- Volume module calculations
- Growth adjustment
- Initial base volume
- Added volume
- User adjustment
- PHF adjustment
- Final volume

In the Traffic Capacity Analysis Module, the report provides
- Vol/Sat
- Critical Moves
- Green Time
- Volume/Gap
- Uniform Del
- Increment Del
- InitQueue Del
- Delay Adj
- Delay/Veh
- User Del/Adj
- Adj Del/Veh
- LOS by Move
- HCM2kAvgQ

The note at the bottom of the page indicates that the queue reported is the number of cars per lane.
Intersection #9: El Camino Real & Page Mill Rd

Street Name:             El Camino Real                     Page Mill Rd
Approach:                 North Bound            South Bound       East Bound       West Bound
Movement:                 L - T - R                  L - T - R                  L - T - R                  L - T - R

Min. Green: 7 30 0 7 30 0 7 28 28 7 30 0
Y+R: 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0

Volume Module:
Base Vol: 550 1470 140 410 600 320 580 1060 180 300 1330 310
Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse: 550 1470 140 410 600 320 580 1060 180 300 1330 310
Added Vol: 0 0 0 0 0 0 0 0 0 0 0 0
PasserByVol: 0 0 0 0 0 0 0 0 0 0 0 0
Initial Fut: 550 1470 140 410 600 320 580 1060 180 300 1330 310
User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Volume: 550 1470 140 410 600 320 580 1060 180 300 1330 310
Reduced Vol: 550 1470 140 410 600 320 580 1060 180 300 1330 310
PCE Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
MLF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
FinalVolume: 550 1470 140 410 600 320 580 1060 180 300 1330 310

Saturation Flow Module:
Sat/Lane: 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900
Adjustment: 0.83 1.00 0.97 0.83 1.00 0.97 0.83 1.00 0.92 0.69 1.00 0.97
Lanes: 2.00 2.73 0.27 2.00 3.00 1.00 2.00 2.00 1.00 2.00 2.00 1.00
Final Sat.: 3150 5191 494 3150 5700 1847 3150 3800 1750 2625 3800 1847

Capacity Analysis Module:
Vol/Sat: 0.17 0.28 0.28 0.13 0.11 0.17 0.18 0.28 0.10 0.11 0.35 0.17
Crit Moves: **** **** **** **** ****
Green Time: 19.3 33.8 33.8 15.5 30.0 30.0 22.0 45.2 45.2 18.5 41.7 41.7
Volume/Cap: 1.13 1.05 1.05 1.05 0.44 0.72 1.05 0.77 0.28 0.77 1.05 0.50
Uniform Del: 52.9 45.6 45.6 54.7 40.3 43.7 51.5 35.3 28.4 51.2 41.6 33.3
IncremntDel: 82.0 36.7 36.7 58.6 1.0 9.8 51.4 4.3 1.1 13.8 38.8 2.9
InitQueueDel: 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0
Delay Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Delay/Veh: 134.8 82.3 82.3 113.4 41.4 53.4 103.0 39.6 29.5 65.0 80.5 36.2
User DelAdj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
AdjDel/Veh: 134.8 82.3 82.3 113.4 41.4 53.4 103.0 39.6 29.5 65.0 80.5 36.2
LOS by Move: F  F  F  F  D  D  F  D  C  E  F  D+
HCM2kAvgQ: 21 29 30 15 7 13 20 19 5 9 34 10
Note: Queue reported is the number of cars per lane.
Intersection #9: El Camino Real & Page Mill Rd

| Final Vol: | 320 | 600 | 416*** |
| Lanes: 1 0 3 0 2 |
| Final Vol: 582*** 1 310 |
| Lanes: 2 0 2 1 0 |

Street Name: El Camino Real & Page Mill Rd

Approach:
- North Bound
- South Bound
- East Bound
- West Bound

Movement: L - T - R

Min. Green: 7 30 7 30 7 28 28 7 30 0

Volume Module:
- Base Vol: 550 1470 140 410 600 320 580 1060 180 300 1330 310
- Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
- Initial Bse: 550 1470 140 410 600 320 580 1060 180 300 1330 310
- Added Vol: 0 7 0 6 0 0 2 2 0 7 4 0
- PasserByVol: 0 0 0 0 0 0 0 0 0 0 0 0
- Initial Fut: 550 1477 140 416 600 320 582 1062 180 307 1334 310
- User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
- PHF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
- PHF Volume: 550 1477 140 416 600 320 582 1062 180 307 1334 310
- Reduced Vol: 550 1477 140 416 600 320 582 1062 180 307 1334 310
- PCE Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
- MLF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
- FinalVolume: 550 1477 140 416 600 320 582 1062 180 307 1334 310

Saturation Flow Module:
- Sat/Lane: 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900
- Adjustment: 0.83 1.00 0.97 0.83 1.00 0.97 0.83 1.00 0.92 0.69 1.00 0.97
- Lanes: 2.00 2.73 0.27 2.00 3.00 1.00 2.00 2.00 1.00 2.00 2.00 1.00
- Final Sat.: 3150 5194 492 3150 5700 1847 3150 3800 1750 2625 3800 1847

Capacity Analysis Module:
- Vol/Sat: 0.17 0.28 0.28 0.13 0.11 0.17 0.18 0.28 0.10 0.12 0.35 0.17
- Green Time: 19.4 33.7 33.7 15.7 30.0 30.0 21.9 44.8 44.8 48.8 41.7 41.7
- Volume/Cap: 1.12 1.05 1.05 1.05 0.44 0.72 1.05 0.78 0.29 0.78 1.05 0.50
- Uniform Del: 52.8 45.6 45.6 54.7 40.3 43.7 51.5 35.7 28.7 51.1 41.7 33.4
- IncremrntDel: 79.3 38.5 38.5 60.0 1.0 9.8 53.1 4.5 1.1 14.1 40.6 2.9
- InitQueueDel: 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0
- Delay Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
- Delay/Veh: 132.1 84.1 84.1 114.7 41.4 35.4 104.6 40.2 29.8 65.3 82.3 36.3
- User Del/Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
- AdjDel/Veh: 132.1 84.1 84.1 114.7 41.4 35.4 104.6 40.2 29.8 65.3 82.3 36.3
- LOS by Move: F F F D D F D D C E F D+ HCM2kAvgQ: 21 29 30 15 7 13 20 19 5 9 35 10

Note: Queue reported is the number of cars per lane.
**Level Of Service Computation Report**

*2000 HCM Operations (Future Volume Alternative)*

**Cumulative AM**

**Intersection #10: PAGEMILL-OREGON EXPWY/MIDDLEFIELD RD**

- **Final Vol:** 160
- **Lanes:** 0 1 1
- **Signal:** Protect
- **Rights:** Include
- **Vol Cnt Date:** n/a
- **Cycle Time (sec):** 180
- **Loss Time (sec):** 12
- **Critical V/C:** 0.820
- **Avg Crit Del (sec/veh):** 65.5
- **Avg Delay (sec/veh):** 59.3
- **Cycle Time (sec):** 180
- **Loss Time (sec):** 12
- **Critical V/C:** 0.820
- **Avg Crit Del (sec/veh):** 65.5
- **Avg Delay (sec/veh):** 59.3
- **LOS:** E+
Intersection #10: PAGEMILL-OREGON EXPWY/MIDDLEFIELD RD

Final Vol: 163
Lanes: 0 1 1 0 1

Final Vol: 163
Lanes: 1

Critical V/C: 0.826
Avg Crit Del (sec/veh): 66.1
Avg Delay (sec/veh): 59.6

LOS: E+

Approach: North Bound South Bound East Bound West Bound
Movement: L - T - R L - T - R L - T - R L - T - R

Min. Green: 7 10 10 7 10 10 7 10 10 7 10 10
Y+R: 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0

Volume Module:
Base Vol: 270 450 160 160 950 140 1350 30
Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse: 270 450 160 160 950 140 1350 30
Added Vol: 3 0 0 0 0 0 0 0
PasserByVol: 0 0 0 0 0 0 0 0

Initial Fut: 273 450 160 163 957 180 140 1357 30
User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Volume: 273 450 160 163 957 180 140 1357 30
Reduct Vol: 0 0 0 0 0 0 0 0
Reduced Vol: 273 450 160 163 957 183 140 1357 30
PCE Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
MLF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
FinalVolume: 273 450 160 163 957 183 140 1357 30

Saturation Flow Module:
Sat/Lane: 1900 1900 1900 1900 1900 1900 1900 1900
Adjustment: 0.92 0.92 0.92 0.92 1.00 1.00 1.00 1.00
Lanes: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00

Final Sat.: 1750 1750 1750 1750 1750 1750 1750 1750

Capacity Analysis Module:
Vol/Sat: 0.16 0.24 0.09 0.04 0.16 0.16 0.09 0.25 0.10 0.08 0.36 0.02

Note: Queue reported is the number of cars per lane.
Intersection #1: Park Blvd & Sherman Ave

Final Vol: 10 330 10
Lanes: 0 0 1

Signal=Uncontrol/Rights=Include

Cycle Time (sec): 100
Loss Time (sec): 0

Critical V/C: 0.169
Avg Crit Del (sec/veh): 3.8
Avg Delay (sec/veh): 3.8

LOS: B

Street Name: Park Blvd          Sherman Ave
Approach: North Bound          South Bound
Movement: L - T - R            L - T - R

Volume Module:
Base Vol: 40 130 10 10 330 10 20 10 120 10 10
Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse: 40 130 10 10 330 10 20 10 120 10 10
Added Vol: 0 0 0 0 0 0 0 0 0 0 0 0
PasserByVol: 0 0 0 0 0 0 0 0 0 0 0 0
Initial Fut: 40 130 10 10 330 10 20 10 120 10 10
User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Volume: 40 130 10 10 330 10 20 10 120 10 10
Reduct Vol: 0 0 0 0 0 0 0 0 0 0 0 0
Final Volume: 40 130 10 10 330 10 20 10 120 10 10

Critical Gap Module:
Critical Gp: 4.1 xxxx xxxx 4.1 xxxx xxxx 7.1 6.5 6.2 7.1 6.5 6.2
FollowUpTim: 2.2 xxxx xxxx 2.2 xxxx xxxx 3.5 4.0 3.3 3.5 4.0 3.3

Capacity Module:
Cnflict Vol: 340 xxxx xxxx 140 xxxx xxxx 580 575 335 635 575 135
Potent Cap.: 1230 xxxx xxxx 1456 xxxx xxxx 429 431 712 394 431 919
Move Cap.: 1230 xxxx xxxx 1456 xxxx xxxx 404 414 712 312 414 919
Volume/Cap: 0.03 xxxx xxxx 0.01 xxxx xxxx 0.05 0.02 0.17 0.03 0.02 0.01

Level Of Service Module:
2Way95thQ: 0.1 xxxx xxxx 0.0 xxxx xxxx xxxx xxxx xxxx xxxx xxxx xxxx
Control Del: 8.0 xxxx xxxx 7.5 xxxx xxxx xxxx xxxx xxxx xxxx xxxx xxxx
Movement: LT - LTR - RT LT - LTR - RT LT - LTR - RT LT - LTR - RT
Shared Cap.: xxxx xxxx xxxx xxxx xxxx xxxx xxxx 619 xxxx xxxx 447 xxxx
SharedQueue:xxxx xxxx xxxx xxxx xxxx xxxx xxxx 0.9 xxxx xxxx 0.2 xxxx
Shrd ConDel:xxxx xxxx xxxx xxxx xxxx xxxx xxxx 12.7 xxxx xxxx 13.6 xxxx
Shared LOS: * * * * * * B * B
ApproachDel: xxxxxx xxxxxx 12.7 13.6
ApproachLOS: * * B B

Note: Queue reported is the number of cars per lane.

Future Volume Alternative: Peak Hour Warrant NOT Met
<table>
<thead>
<tr>
<th>Approach:</th>
<th>North Bound</th>
<th>South Bound</th>
<th>East Bound</th>
<th>West Bound</th>
</tr>
</thead>
<tbody>
<tr>
<td>Movement:</td>
<td>L - T - R</td>
<td>L - T - R</td>
<td>L - T - R</td>
<td>L - T - R</td>
</tr>
<tr>
<td>Control:</td>
<td>Uncontrolled</td>
<td>Uncontrolled</td>
<td>Stop Sign</td>
<td>Stop Sign</td>
</tr>
<tr>
<td>Lanes:</td>
<td>0 0 1! 0 0 0</td>
<td>0 0 1! 0 0 0</td>
<td>0 0 1! 0 0 0</td>
<td>0 0 1! 0 0 0</td>
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<tr>
<td>Initial Vol:</td>
<td>40 130 10</td>
<td>10 330 10</td>
<td>20 10 120</td>
<td>10 10 10</td>
</tr>
<tr>
<td>Approach Del:</td>
<td>xxxxxxx</td>
<td></td>
<td>12.7</td>
<td>13.6</td>
</tr>
</tbody>
</table>

### Approach [eastbound] [lanes=1] [control=Stop Sign]

**Signal Warrant Rule #1**: [vehicle-hours=0.5]

FAIL - Vehicle-hours less than 4 for one lane approach.

**Signal Warrant Rule #2**: [approach volume=150]

SUCCEED - Approach volume greater than or equal to 100 for one lane approach.

**Signal Warrant Rule #3**: [approach volume=710]

FAIL - Total volume less than 650 for intersection with less than four approaches.

---

### Approach [westbound] [lanes=1] [control=Stop Sign]

**Signal Warrant Rule #1**: [vehicle-hours=0.1]

FAIL - Vehicle-hours less than 4 for one lane approach.

**Signal Warrant Rule #2**: [approach volume=30]

FAIL - Approach volume less than 100 for one lane approach.

**Signal Warrant Rule #3**: [approach volume=710]

FAIL - Total volume less than 650 for intersection with less than four approaches.

---

**SIGNAL WARRANT DISCLAIMER**

This peak hour signal warrant analysis should be considered solely as an "indicator" of the likelihood of an unsignalized intersection warranting a traffic signal in the future. Intersections that exceed this warrant are probably more likely to meet one or more of the other volume based signal warrant (such as the 4-hour or 8-hour warrants).

The peak hour warrant analysis in this report is not intended to replace a rigorous and complete traffic signal warrant analysis by the responsible jurisdiction. Consideration of the other signal warrants, which is beyond the scope of this software, may yield different results.
## Level Of Service Computation Report

### 2000 HCM Unsignalized (Future Volume Alternative)
Cumulative+Project PM

### Intersection #1: Park Blvd & Sherman Ave

| Final Vol: | 27 | 330 | 10 |
| Signal=Uncontrol/Rights=Include |
| Lanes: | 0 | 0 | 0 |
| Vol Cnt Date: n/a |
| Cycle Time (sec): 100 |

| Final Vol: | 10 |
| Signal=Stop |
| Rights=Include |
| Lanes: | 0 | 0 | 0 |
| Loss Time (sec): 0 |
| Critical V/C: 0.217 |
| Avg Crit Del (sec/veh): 4.9 |
| Avg Delay (sec/veh): 4.9 |
| LOS: B |

**Street Name:**

| Park Blvd |
| Sherman Ave |

| Approach: | North Bound | South Bound | East Bound | West Bound |
| Movement: | L - T - R | L - T - R | L - T - R | L - T - R |
| Volume Module: |
| Base Vol: | 40 | 130 | 10 | 10 | 330 | 10 | 20 | 10 | 120 | 10 | 10 | 10 |
| Growth Adj: | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Initial Bse: | 40 | 130 | 10 | 10 | 330 | 10 | 20 | 10 | 120 | 10 | 10 | 10 |
| Added Vol: | 19 | 0 | 0 | 0 | 17 | 18 | 0 | 33 | 0 | 0 | 0 | 0 |
| PasserByVol: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Initial Fut: | 59 | 130 | 10 | 10 | 330 | 27 | 38 | 10 | 153 | 10 | 10 | 10 |
| User Adj: | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PHF Adj: | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PHF Volume: | 59 | 130 | 10 | 10 | 330 | 27 | 38 | 10 | 153 | 10 | 10 | 10 |
| Reduct Vol: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| FinalVolume: | 59 | 130 | 10 | 10 | 330 | 27 | 38 | 10 | 153 | 10 | 10 | 10 |

**Critical Gap Module:**

| Critical Gp: | 4.1 xxxx xxxx xxxx | 4.1 xxxx xxxx xxxx | 7.1 | 6.5 | 6.2 | 7.1 | 6.5 | 6.2 |
| FollowUpTim: | 2.2 xxxx xxxx xxxx | 2.2 xxxx xxxx xxxx | 3.5 | 4.0 | 3.3 | 3.5 | 4.0 | 3.3 |

**Capacity Module:**

| Cnflict Vol: | 357 xxxx xxxx xxxx | 140 xxxx xxxx xxxx | 627 | 622 | 344 | 698 | 630 | 135 |
| Potent Cap.: | 1213 xxxx xxxx xxxx | 1456 xxxx xxxx xxxx | 399 | 406 | 704 | 358 | 401 | 919 |
| Move Cap.: | 1213 xxxx xxxx xxxx | 1456 xxxx xxxx xxxx | 370 | 383 | 704 | 262 | 378 | 919 |
| Volume/Cap: | 0.05 xxxx xxxx xxxx | 0.01 xxxx xxxx xxxx | 0.10 | 0.03 | 0.22 | 0.04 | 0.03 | 0.01 |

**Level Of Service Module:**

| 2Way95thQ: | 0.2 xxxx xxxx xxxx | 0.0 xxxx xxxx xxxx | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Control Del: | 8.1 xxxx xxxx xxxx | 7.5 xxxx xxxx xxxx | 7.5 | 7.5 | 7.5 | 7.5 | 7.5 | 7.5 |
| LOS by Move: A | A | A | A | A | A | A | A | A |
| Movement: | LT - LTR - RT | LT - LTR - RT | LT - LTR - RT | LT - LTR - RT |
| Shared Cap.: | xxxx xxxx xxxx xxxx xxxx xxxx xxxx | xxxx xxxx xxxx xxxx xxxx xxxx xxxx | 581 xxxx xxxx xxxx xxxx xxxx xxxx xxxx | 398 xxxx xxxx xxxx xxxx xxxx xxxx xxxx |
| SharedQueue: | xxxx xxxx xxxx xxxx xxxx xxxx xxxx | 1.5 xxxx xxxx xxxx xxxx | 0.2 xxxx xxxx xxxx |
| Shrd ConDel: | xxxx xxxx xxxx xxxx xxxx xxxx xxxx | 14.4 xxxx xxxx xxxx xxxx | 14.8 xxxx xxxx xxxx |
| Shared LOS: | * | * | * | * | * | B | * | B |
| ApproachDel: | xxxxxxx | xxxxxxx | 14.4 | 14.8 |
| ApproachLOS: | B | B |

Note: Queue reported is the number of cars per lane.
### Approach: North Bound | South Bound | East Bound | West Bound
---|---|---|---
**Movement:** | L - T - R | L - T - R | L - T - R | L - T - R
---|---|---|---|---
**Control:** | Uncontrolled | Uncontrolled | Stop Sign | Stop Sign
---|---|---|---|---
**Lanes:** | 0 0 1! 0 0 | 0 0 1! 0 0 | 0 0 1! 0 0 | 0 0 1! 0 0
---|---|---|---|---
**Initial Vol:** | 59 130 | 10 330 | 27 38 | 10 153 | 10 10 | 10
---|---|---|---|---|---
**Approach Del:** | xxxxxx | 14.4 | 14.8

**Approach [eastbound][lanes=1][control=Stop Sign]**

- **Signal Warrant Rule #1:** [vehicle-hours=0.8]
  - FAIL - Vehicle-hours less than 4 for one lane approach.
- **Signal Warrant Rule #2:** [approach volume=201]
  - SUCCEED - Approach volume greater than or equal to 100 for one lane approach.
- **Signal Warrant Rule #3:** [approach count=4][total volume=797]
  - FAIL - Total volume less than 650 for intersection with less than four approaches.

**Approach [westbound][lanes=1][control=Stop Sign]**

- **Signal Warrant Rule #1:** [vehicle-hours=0.1]
  - FAIL - Vehicle-hours less than 4 for one lane approach.
- **Signal Warrant Rule #2:** [approach volume=30]
  - FAIL - Approach volume less than 100 for one lane approach.
- **Signal Warrant Rule #3:** [approach count=4][total volume=797]
  - FAIL - Total volume less than 650 for intersection with less than four approaches.

**SIGNAL WARRANT DISCLAIMER**
This peak hour signal warrant analysis should be considered solely as an "indicator" of the likelihood of an unsignalized intersection warranting a traffic signal in the future. Intersections that exceed this warrant are probably more likely to meet one or more of the other volume based signal warrant (such as the 4-hour or 8-hour warrants).

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---

### SIGNAL WARRANT DISCLAIMER
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The peak hour warrant analysis in this report is not intended to replace a rigorous and complete traffic signal warrant analysis by the responsible jurisdiction. Consideration of the other signal warrants, which is beyond the scope of this software, may yield different results.
Intersection #2: Park Blvd & Page Mill Rd

Street Name: Park Blvd
Approach: North Bound
Movement: L - T - R
Min. Green: 7
Y+R: 4.0
Volume Module:
Base Vol: 140
Growth Adj: 1.00
Initial Bse: 140
Added Vol: 0
PasserByVol: 0
Initial Fut: 140
User Adj: 1.00
PHE Volume: 140
Reduct Vol: 0
Reduced Vol: 140
PCE Adj: 1.00
FinalVolume: 140

Street Name: Page Mill Rd
Approach: South Bound
Movement: L - T - R
Min. Green: 7
Y+R: 4.0
Volume Module:
Base Vol: 160
Growth Adj: 1.00
Initial Bse: 140
Added Vol: 0
PasserByVol: 0
Initial Fut: 140
User Adj: 1.00
PHE Volume: 140
Reduct Vol: 0
Reduced Vol: 140
PCE Adj: 1.00
FinalVolume: 140

Capacity Analysis Module:
Vol/Sat: 0.17
Crit Moves: ****
Green Time: 17.8
Volume/Cap: 0.88
Uniform Del: 35.1
IncremDel: 22.1
InitQueueDel: 0.0
Delay Adj: 1.00
Delay/Veh: 57.2
User DelAdj: 1.00
AdjDel/Veh: 57.2
LOS by Move: E+ E+ B B D+ D+ D+ D+ D+

Note: Queue reported is the number of cars per lane.
Level Of Service Computation Report
2000 HCM Operations (Future Volume Alternative)
Cumulative+Project PM

Intersection #2: Park Blvd & Page Mill Rd

Street Name:        Park Blvd                        Page Mill Rd
Approach:                       North Bound      South Bound       East Bound       West Bound
Movement:          L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
---------    |---------   |---------   |---------   |---------
Min. Green:  7  10  10  7  10  10  7  10  10  7  10  10
Y+R:       4.0  4.0  4.0  4.0  4.0  4.0  4.0  4.0  4.0  4.0  4.0  4.0
---------    |---------   |---------   |---------   |---------
Volume Module:
Base Vol:    140  160    10    10  270   470    42   10    30    10   30    30
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:  140  160    10    10  270   470    42   10    30    10   30    30
Added Vol:   0    0     0     0    0    18     2    0     0     0    0     0
PasserByVol: 0    0     0     0    0     0     0    0     0     0    0     0
Initial Fut:  140  160    10    10  270   488    42   10    30    10   30    30
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHE Volume:  140  160    10    10  270   488    42   10    30    10   30    30
Critical V/C: 0.845

Note: Queue reported is the number of cars per lane.
**Level Of Service Computation Report**

**2000 HCM 4-Way Stop (Future Volume Alternative)**

**Cumulative PM**

### Intersection #3: Birch St & Sherman Ave

**Final Vol:** 20 70 50

**Final Vol:** 20

**Cycle Time (sec):** 100

**Loss Time (sec):** 0

**Critical V/C:** 0.256

**Avg Crit Del (sec/veh):** 9.3

**Avg Delay (sec/veh):** 9.3

**LOS:** A

### Street Name: Birch St

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<thead>
<tr>
<th>Approach</th>
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<th>South Bound</th>
<th>East Bound</th>
<th>West Bound</th>
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</thead>
<tbody>
<tr>
<td>Movement</td>
<td>L - T - R</td>
<td>L - T - R</td>
<td>L - T - R</td>
<td>L - T - R</td>
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<tr>
<td>Min. Green</td>
<td>7 10 10</td>
<td>7 10 10</td>
<td>7 10 10</td>
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### Volume Module:

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<tr>
<th>Base Vol</th>
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<tbody>
<tr>
<td>Growth Adj</td>
<td>1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00</td>
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<tr>
<td>Initial Bse</td>
<td>70 220 40 50 70 20 20 110 20 20 40 20</td>
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<tr>
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<td>PasserByVol</td>
<td>0 0 0 0 0 0 0 0 0 0 0 0</td>
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<tr>
<td>Initial Fut</td>
<td>70 220 40 50 70 20 20 110 20 20 40 20</td>
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<td>1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00</td>
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<td>PHF Adj</td>
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<td>PHF Volume</td>
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### Saturation Flow Module:

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<tbody>
<tr>
<td>Final Sat.</td>
<td>273 894 167 427 641 188 89 492 89 164 327 164</td>
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### Capacity Analysis Module:

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<th>Vol/Sat</th>
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<tr>
<td>Crit Moves</td>
<td>**** **** **** **** ****</td>
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<tr>
<td>Delay/Veh</td>
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<tr>
<td>Delay Adj</td>
<td>1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00</td>
</tr>
<tr>
<td>AdjDel/Veh</td>
<td>9.9 9.6 9.3 9.2 8.7 8.5 9.4 9.4 9.4 8.8 8.8 8.8</td>
</tr>
<tr>
<td>LOS by Move</td>
<td>A A A A A A A A A A A</td>
</tr>
<tr>
<td>ApproachDel</td>
<td>9.6 8.9 9.4 8.8</td>
</tr>
<tr>
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<td>1.00 1.00 1.00 1.00</td>
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<td>A A A A A A</td>
</tr>
<tr>
<td>AllWayAvgQ</td>
<td>0.3 0.3 0.7 0.1 0.1 0.3 0.3 0.3 0.3 0.1 0.1 0.1</td>
</tr>
</tbody>
</table>

**Note:** Queue reported is the number of cars per lane.

---

**Peak Hour Volume Signal Warrant Report [Urban]**

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**Intersection #3 Birch St & Sherman Ave**

---
Future Volume Alternative: Peak Hour Warrant NOT Met

<table>
<thead>
<tr>
<th>Approach: North Bound</th>
<th>South Bound</th>
<th>East Bound</th>
<th>West Bound</th>
</tr>
</thead>
<tbody>
<tr>
<td>Movement: L - T - R</td>
<td>L - T - R</td>
<td>L - T - R</td>
<td>L - T - R</td>
</tr>
<tr>
<td>Control: Stop Sign</td>
<td>Stop Sign</td>
<td>Stop Sign</td>
<td>Stop Sign</td>
</tr>
<tr>
<td>Lanes: 0 1 0 1 0</td>
<td>0 1 0 1 0</td>
<td>0 0 1 0</td>
<td>0 0 1 0</td>
</tr>
<tr>
<td>Initial Vol: 70 220</td>
<td>40 50 20</td>
<td>20 110 20</td>
<td>20 40 20</td>
</tr>
</tbody>
</table>

Major Street Volume: 470
Minor Approach Volume: 150
Minor Approach Volume Threshold: 545

SIGNAL WARRANT DISCLAIMER
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**Intersection #3: Birch St & Sherman Ave**

**Cumulative + Project PM**

**Street Name:** Birch St  
**Approach:** North Bound  
**Movement:** L - T - R  
**Min. Green:** 7 10 10 7 10 10

| Volume Module: | Base Vol: | 70 220 70 220 70 220 70 220 70 220 | Growth Adj: | 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 | Initial Bse: | 70 220 70 220 70 220 70 220 70 220 | Added Vol: | 0 6 0 20 17 10 0 17 21 43 9 7 | PasserByVol: | 0 0 0 0 0 0 0 0 0 0 0 0 | Initial Fut: | 70 226 70 226 70 226 70 226 70 226 |
|----------------|-----------|----------------------------------|-------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| User Adj: | 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 | PHF Adj: | 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 | PHF Volume: | 70 226 70 226 70 226 70 226 70 226 |
| Reduct Vol: | 0 6 0 20 17 10 0 17 21 43 9 7 | PCE Adj: | 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 | Final Volume: | 70 226 70 226 70 226 70 226 70 226 |
| Final Vol: | 70 226 70 226 70 226 70 226 70 226 |

**Saturation Flow Module:**

| Adjustment: | 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 | Lanes: | 0.39 1.27 0.34 0.73 0.87 0.40 0.18 0.69 0.13 0.21 0.58 0.21 |
| Final Sat.: | 232 780 214 397 510 244 116 433 82 126 350 131 |

**Capacity Analysis Module:**

| Vol/Sat: | 0.30 0.29 0.28 0.17 0.16 0.15 0.35 0.35 0.35 0.21 0.21 0.21 |
| Crit Moves: | **** **** **** **** |
| Delay/Veh: | 11.0 10.5 10.1 10.1 9.5 9.2 11.1 11.1 11.1 9.9 9.9 9.9 |
| Delay Adj: | 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 |
| AdjDel/Veh: | 11.0 10.5 10.1 10.1 9.5 9.2 11.1 11.1 11.1 9.9 9.9 9.9 |
| LOS by Move: | B B B A A A B B A A A A |
| ApproachDel: | 10.6 9.7 11.1 9.9 |
| Delay Adj: | 1.00 1.00 |
| ApprAdjDel: | 10.6 9.7 11.1 9.9 |
| LOS by Appr: | B B B A A |
| AllWayAvgQ: | 0.4 0.4 0.4 0.2 0.2 0.5 0.5 0.5 0.2 0.2 0.2 0.2 |

**Note:** Queue reported is the number of cars per lane.

---

**Peak Hour Volume Signal Warrant Report [Urban]**

---

**Intersection #3 Birch St & Sherman Ave**
Future Volume Alternative: Peak Hour Warrant NOT Met

<table>
<thead>
<tr>
<th>Approach:</th>
<th>North Bound</th>
<th>South Bound</th>
<th>East Bound</th>
<th>West Bound</th>
</tr>
</thead>
<tbody>
<tr>
<td>Movement:</td>
<td>L - T - R</td>
<td>L - T - R</td>
<td>L - T - R</td>
<td>L - T - R</td>
</tr>
<tr>
<td>Control:</td>
<td>Stop Sign</td>
<td>Stop Sign</td>
<td>Stop Sign</td>
<td>Stop Sign</td>
</tr>
<tr>
<td>Lanes:</td>
<td>0 1 0 1 0</td>
<td>0 1 0 1 0</td>
<td>0 0 1 0 0</td>
<td>0 0 1 0 0</td>
</tr>
<tr>
<td>Initial Vol:</td>
<td>70 226 60</td>
<td>67 80 37</td>
<td>41 153 29</td>
<td>27 75 28</td>
</tr>
</tbody>
</table>

Major Street Volume: 540
Minor Approach Volume: 223
Minor Approach Volume Threshold: 497

SIGNAL WARRANT DISCLAIMER
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Level Of Service Computation Report
2000 HCM Unsignalized (Future Volume Alternative)
Cumulative PM

Intersection #4: Birch St & Grant Ave

Street Name: Birch St
Approach: North Bound South Bound East Bound West Bound
Movement: L - T - R L - T - R L - T - R L - T - R

Volume Module:
Base Vol: 20 330 30 10 80 20 30 50 20 0 0 0
Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse: 20 330 30 10 80 20 30 50 20 0 0 0
Added Vol: 0 0 0 0 0 0 0 0 0 0 0 0
PasserByVol: 0 0 0 0 0 0 0 0 0 0 0 0
Initial Fut: 20 330 30 10 80 20 30 50 20 0 0 0
User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Volume: 20 330 30 10 80 20 30 50 20 0 0 0
Reduct Vol: 0 0 0 0 0 0 0 0 0 0 0 0
FinalVolume: 20 330 30 10 80 20 30 50 20 0 0 0

Critical Gap Module:
Critical Gp: 4.1 xxxx xxxx 4.1 xxxx xxxx 6.8 6.5 6.9 xxxx xxxx xxxx
FollowUpTim: 2.2 xxxx xxxx 2.2 xxxx xxxx 3.5 4.0 3.3 xxxx xxxx xxxx

Capacity Module:
Cnflict Vol: 100 xxxx xxxx 360 xxxx xxxx 315 510 50 xxxx xxxx xxxx
Potent Cap.: 1505 xxxx xxxx 1210 xxxx xxxx 659 459 1014 xxxx xxxx xxxx
Move Cap.: 1505 xxxx xxxx 1210 xxxx xxxx 648 459 1014 xxxx xxxx xxxx
Volume/Cap: 0.01 xxxx 0.01 0.01 572 572 572 572 572 572 572 572

Level Of Service Module:
2Way95thQ: 0.0 xxxx xxxx 0.0 xxxx xxxx xxxx xxxx xxxx xxxx xxxx
Control Del: 7.4 xxxx xxxx 8.0 xxxx xxxx xxxx xxxx xxxx xxxx xxxx

Note: Queue reported is the number of cars per lane.

Peak Hour Delay Signal Warrant Report

************************************************************
Intersection #4 Birch St & Grant Ave
************************************************************
Future Volume Alternative: Peak Hour Warrant NOT Met
<table>
<thead>
<tr>
<th>Approach:</th>
<th>North Bound</th>
<th>South Bound</th>
<th>East Bound</th>
<th>West Bound</th>
</tr>
</thead>
<tbody>
<tr>
<td>Movement:</td>
<td>L - T - R</td>
<td>L - T - R</td>
<td>L - T - R</td>
<td>L - T - R</td>
</tr>
<tr>
<td>Control:</td>
<td>Uncontrolled</td>
<td>Uncontrolled</td>
<td>Stop Sign</td>
<td>Stop Sign</td>
</tr>
<tr>
<td>Lanes:</td>
<td>0 1 0 1 0</td>
<td>0 1 0 1 0</td>
<td>0 0 1 0 0</td>
<td>0 0 0 0 0</td>
</tr>
<tr>
<td>Initial Vol:</td>
<td>20 330</td>
<td>30 10 80</td>
<td>20 30 50</td>
<td>20 0 0 0 0</td>
</tr>
</tbody>
</table>

**Approach Del:** xxxxxx

**Approach [eastbound] [lanes=1] [control=Stop Sign]**

**Signal Warrant Rule #1:** [vehicle-hours=0.4]  
FAIL - Vehicle-hours less than 4 for one lane approach.

**Signal Warrant Rule #2:** [approach volume=100]  
SUCCEED - Approach volume greater than or equal to 100 for one lane approach.

**Signal Warrant Rule #3:** [approach count=3][total volume=590]  
FAIL - Total volume less than 650 for intersection with less than four approaches.

**SIGNAL WARRANT DISCLAIMER**
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**Peak Hour Volume Signal Warrant Report [Urban]**

**Intersection #4 Birch St & Grant Ave**

**Future Volume Alternative: Peak Hour Warrant NOT Met**

<table>
<thead>
<tr>
<th>Approach:</th>
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<th>East Bound</th>
<th>West Bound</th>
</tr>
</thead>
<tbody>
<tr>
<td>Movement:</td>
<td>L - T - R</td>
<td>L - T - R</td>
<td>L - T - R</td>
<td>L - T - R</td>
</tr>
<tr>
<td>Control:</td>
<td>Uncontrolled</td>
<td>Uncontrolled</td>
<td>Stop Sign</td>
<td>Stop Sign</td>
</tr>
<tr>
<td>Lanes:</td>
<td>0 1 0 1 0</td>
<td>0 1 0 1 0</td>
<td>0 0 1 0 0</td>
<td>0 0 0 0 0</td>
</tr>
<tr>
<td>Initial Vol:</td>
<td>20 330</td>
<td>30 10 80</td>
<td>20 30 50</td>
<td>20 0 0 0 0</td>
</tr>
</tbody>
</table>

**Major Street Volume:** 490

**Minor Approach Volume:** 100

**Minor Approach Volume Threshold:** 531

**SIGNAL WARRANT DISCLAIMER**
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**Level Of Service Computation Report**

**2000 HCM Unsignalized (Future Volume Alternative)**

**Cumulative+Project PM**

**Intersection #4: Birch St & Grant Ave**

**Street Name:** Birch St & Grant Ave

**Approach:**
- North Bound
- South Bound
- East Bound
- West Bound

**Movement:**
- L - T - R
- L - T - R
- L - T - R
- L - T - R

**Volume Module:**
- Base Vol:
  - 20 330 30 10 80 20 30 50 20 0 0 0
- Growth Adj:
  - 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
- Initial Bse:
  - 20 330 30 10 80 20 30 50 20 0 0 0
- Added Vol:
  - 0 26 0 2 14 0 0 0 0 0 0 0
- PasserByVol:
  - 0 0 0 0 0 0 0 0 0 0 0 0
- Initial Fut:
  - 20 356 30 12 94 20 30 50 20 0 0 0
- User Adj:
  - 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
- PHF Adj:
  - 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
- PHF Volume:
  - 20 356 30 12 94 20 30 50 20 0 0 0
- Reduct Vol:
  - 0 0 0 0 0 0 0 0 0 0 0 0
- FinalVolume:
  - 20 356 30 12 94 20 30 50 20 0 0 0

**Critical Gap Module:**
- Critical Gp:
  - 4.1 xxxx xxxxx 4.1 xxxx xxxxx 6.8 6.5 6.9 xxxx xxxx xxxxx
- FollowUpTim:
  - 2.2 xxxx xxxxx 2.2 xxxx xxxxx 3.5 4.0 3.3 xxxx xxxx xxxxx

**Capacity Module:**
- Cnflict Vol:
  - 114 xxxx xxxx 386 xxxx xxxx 346 554 57 xxxx xxxx xxxxx
- Potent Cap.:
  - 1488 xxxx xxxx 1184 xxxx xxxx 630 443 1004 xxxx xxxx xxxxx
- Move Cap.:
  - 1488 xxxx xxxx 1184 xxxx xxxx 619 433 1004 xxxx xxxx xxxxx
- Volume/Cap:
  - 0.01 xxxx xxxx 3.5 4.0 3.3 xxxx xxxx xxxxx

**Level Of Service Module:**
- 2Way95thQ:
  - 0.0 xxxx xxxx 0.0 xxxx xxxx xxxx xxxx xxxx xxxx xxxx xxxx
- Control Del:
  - 7.5 xxxx xxxx 8.1 xxxx xxxx xxxx xxxx xxxx xxxx xxxx xxxx
- LOS by Move:
  - A * A * A * A * A * * * * * * * * * * * * *
- Movement:
  - LT - LTR - RT LT - LTR - RT LT - LTR - RT LT - LTR - RT
- Shared Cap.:
  - xxxx xxxx xxxx xxxx xxxx xxxx xxxx xxxx xxxx 543 xxxx xxxx xxxx xxxx
- SharedQueue:
  - 0.0 xxxx xxxx xxxx xxxx 0.7 xxxx xxxx xxxx xxxx xxxx xxxx xxxx xxxx
- Shrd ConDel:
  - 7.5 xxxx xxxx 8.1 xxxx xxxx xxxx xxxx 13.1 xxxx xxxx xxxx xxxx xxxx
- Shrd LOS:
  - A * A * A * A * B * * * * * *
- ApproachDel:
  - xxxx xxxx 13.1 xxxx xxxx
- ApproachLOS:
  - B *

**Note:** Queue reported is the number of cars per lane.

**Peak Hour Delay Signal Warrant Report**

**Intersection #4 Birch St & Grant Ave**

**Future Volume Alternative: Peak Hour Warrant NOT Met**
<table>
<thead>
<tr>
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<th>East Bound</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Movement: L - T - R</td>
<td>L - T - R</td>
<td>L - T - R</td>
<td>L - T - R</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Control: Uncontrolled</th>
<th>Uncontrolled</th>
<th>Stop Sign</th>
<th>Stop Sign</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lanes: 0 1 0 1 0</td>
<td>0 1 0 1 0</td>
<td>0 0</td>
<td>0 0</td>
</tr>
<tr>
<td>Initial Vol: 20 356</td>
<td>30 12 94 20</td>
<td>30 50 20  0</td>
<td>0 0 0 0 0</td>
</tr>
<tr>
<td>ApproachDel: xxxxxx</td>
<td>xxxxxx 13.1</td>
<td>xxxxxx</td>
<td></td>
</tr>
</tbody>
</table>

Approach[eastbound][lanes=1][control=Stop Sign]

Signal Warrant Rule #1: [vehicle-hours=0.4]
FAIL - Vehicle-hours less than 4 for one lane approach.

Signal Warrant Rule #2: [approach volume=100]
SUCCEED - Approach volume greater than or equal to 100 for one lane approach.

Signal Warrant Rule #3: [approach count=3][total volume=632]
FAIL - Total volume less than 650 for intersection
with less than four approaches.

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Intersection #4 Birch St & Grant Ave

Future Volume Alternative: Peak Hour Warrant NOT Met

<table>
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<th>West Bound</th>
</tr>
</thead>
<tbody>
<tr>
<td>Movement: L - T - R</td>
<td>L - T - R</td>
<td>L - T - R</td>
<td>L - T - R</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Control: Uncontrolled</th>
<th>Uncontrolled</th>
<th>Stop Sign</th>
<th>Stop Sign</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lanes: 0 1 0 1 0</td>
<td>0 1 0 1 0</td>
<td>0 0</td>
<td>0 0</td>
</tr>
<tr>
<td>Initial Vol: 20 356</td>
<td>30 12 94 20</td>
<td>30 50 20  0</td>
<td>0 0 0 0 0</td>
</tr>
<tr>
<td>Major Street Volume:</td>
<td>532</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Minor Approach Volume:</td>
<td>100</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Minor Approach Volume Threshold: 502</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

SIGNAL WARRANT DISCLAIMER
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Intersection #5: Birch St & Sheridan Ave

Final Vol: 10 70 0 0
Lanes: 0 1 0 1

Signal=Uncontrol/Rights=Include
Cycle Time (sec): 100

Final Vol: 0 0 10 0
Lanes: 0 0 0 0

Cycle Time (sec): 100

Critical V/C: 0.413

Avg Crit Del (sec/veh): 7.8

Avg Delay (sec/veh): 7.8

LOS: D

Street Name: Birch St
Approach: North Bound
Movement: L - T - R

Volume Module:
Base Vol: 90 340 150 30 70 10 10 10 120 40 10
Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse: 90 340 150 30 70 10 10 10 120 40 10
Added Vol: 0 0 0 0 0 0 0 0 0 0 0
PasserByVol: 0 0 0 0 0 0 0 0 0 0 0
Initial Fut: 90 340 150 30 70 10 10 10 120 40 10
User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Volume: 90 340 150 30 70 10 10 10 120 40 10
User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Reduct Vol: 0 0 0 0 0 0 0 0 0 0 0
Final Volume: 90 340 150 30 70 10 10 10 120 40 10

Critical Gap Module:
Critical Gp: 4.1 xxxx xxxx 4.1 xxxx xxxx 7.1 6.5 6.2 7.1 6.5 6.2
FollowUpTim: 2.2 xxxx xxxx 2.2 xxxx xxxx 3.5 4.0 3.3 3.5 4.0 3.3

Capacity Module:
Cnflict Vol: 80 xxxx xxxx 490 xxxx xxxx 755 805 40 710 735 415
Potent Cap.: 1531 xxxx xxxx 1084 xxxx xxxx 328 318 1037 351 349 642
Move Cap.: 1531 xxxx xxxx 1084 xxxx xxxx 272 290 1037 290 318 642
Volume/Cap: 0.06 xxxx xxxx 0.03 xxxx xxxx 0.04 0.14 0.01 0.41 0.13 0.02

Level Of Service Module:
2Way95thQ: 0.2 xxxx xxxx 0.1 xxxx xxxx xxxx xxxx xxxx xxxx xxxx xxxx xxxx xxxx
Control Del: 7.5 xxxx xxxx 8.4 xxxx xxxx xxxx xxxx xxxx xxxx xxxx xxxx xxxx
LOS by Move: A * * A * * A * * * * *
Movement: LT - LT - RT - LT - LT - RT - LT - LT - RT
Shared Cap.: xxxx xxxx xxxx xxxx xxxx xxxx xxxx 326 xxxx xxxx 307 xxxx
SharedQueue: 0.1 xxxx xxxx xxxx 0.7 xxxx xxxx 3.2 xxxx
Shrd ConDel: 8.4 xxxx xxxx xxxx 18.5 xxxx xxxx 30.4 xxxx
Shared LOS: A * * A * * C * * D *
ApproachDel: xxxxxx xxxxxx 18.5 30.4
ApproachLOS: * C D

Note: Queue reported is the number of cars per lane.

Peak Hour Delay Signal Warrant Report

Intersection #5 Birch St & Sheridan Ave

Future Volume Alternative: Peak Hour Warrant NOT Met
### Approach: North Bound

**Movement:** L - T - R

**Control:** Uncontrolled

**Lanes:** 0 0 1! 0 0

**Initial Vol:** 90 340 150

**Approach Del:** xxxxxx

### Approach: South Bound

**Movement:** L - T - R

**Control:** Uncontrolled

**Lanes:** 0 1 0 1 0 0 0 1! 0 0

**Initial Vol:** 30 70 10 10 40 10 120 40 10

**Approach Del:** xxxxxx

### Approach: East Bound

**Movement:** L - T - R

**Control:** Stop Sign

**Lanes:** 0 0 1! 0 0

**Initial Vol:** 0 0 1! 0 0

**Approach Del:** 18.5

### Approach: West Bound

**Movement:** L - T - R

**Control:** Stop Sign

**Lanes:** 0 0 1! 0 0

**Initial Vol:** 0 0 1! 0 0

**Approach Del:** 30.4

---

**Signal Warrant Rule #1:** [vehicle-hours=0.3]

**FAIL -** Vehicle-hours less than 4 for one lane approach.

**Signal Warrant Rule #2:** [approach volume=60]

**FAIL -** Approach volume less than 100 for one lane approach.

**Signal Warrant Rule #3:** [approach count=4][total volume=920]

**SUCCEED -** Total volume greater than or equal to 800 for intersection with four or more approaches.

---

**Signal Warrant Rule #1:** [vehicle-hours=1.4]

**FAIL -** Vehicle-hours less than 4 for one lane approach.

**Signal Warrant Rule #2:** [approach volume=170]

**SUCCEED -** Approach volume greater than or equal to 100 for one lane approach.

**Signal Warrant Rule #3:** [approach count=4][total volume=920]

**SUCCEED -** Total volume greater than or equal to 800 for intersection with four or more approaches.

---

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---

**Intersection #5 Birch St & Sheridan Ave**

**Future Volume Alternative:** Peak Hour Warrant NOT Met

**Major Street Volume:** 690

**Minor Approach Volume:** 170

**Minor Approach Volume Threshold:** 413

---

**Signal Warrant Disclaimer**

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Level Of Service Computation Report
2000 HCM Unsignalized (Future Volume Alternative)
Cumulative+Project PM

Intersection #5: Birch St & Sheridan Ave

Street Name: Birch St Sheridan Ave
Approach: North Bound South Bound East Bound West Bound
Movement: L - T - R L - T - R L - T - R L - T - R

Volume Module:
Base Vol: 90 340 150 30 70 10 10 40 10 120 40 10
Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse: 90 340 150 30 70 10 10 40 10 120 40 10
Added Vol: 0 26 0 0 14 0 0 0 0 0 0 0
PasserByVol: 0 0 0 0 0 0 0 0 0 0 0 0
Initial Fut: 90 366 150 30 84 10 10 40 10 120 40 10
User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Volume: 90 366 150 30 84 10 10 40 10 120 40 10
Reduct Vol: 0 0 0 0 0 0 0 0 0 0 0 0
Final Volume: 90 366 150 30 84 10 10 40 10 120 40 10

Critical Gap Module:
Critical Gp: 4.1 xxxx xxxx 4.1 xxxx xxxx 7.1 6.5 6.2 7.1 6.5 6.2
FollowUpTim: 2.2 xxxx xxxx 2.2 xxxx xxxx 3.5 4.0 3.3 3.5 4.0 3.3

Capacity Module:
Cnflict Vol: 94 xxxx xxxx 516 xxxx xxxx 795 845 47 743 775 441
Potent Cap.: 1513 xxxx xxxx 1060 xxxx xxxx 308 302 1028 334 331 621
Move Cap.: 1513 xxxx xxxx 1060 xxxx xxxx 254 275 1028 274 302 621
Volume/Cap: 0.06 xxxx xxxx 0.03 xxxx xxxx 0.04 0.15 0.01 0.44 0.13 0.02

Level Of Service Module:
2Way95thQ: 0.2 xxxx xxxx 0.1 xxxx xxxx xxxx xxxx xxxx xxxx xxxx xxxx
Control Del: 7.5 xxxx xxxx 8.5 xxxx xxxx xxxx xxxx xxxx xxxx xxxx xxxx
LOS by Move: A * * A * * A * * * * *
Movement: LT - LTR - RT LT - LTR - RT LT - LTR - RT LT - LTR - RT
Shared Cap.: xxxx xxxx xxxx xxxx xxxx xxxx xxxx xxxx 308 xxxx xxxx 290 xxxx
SharedQueue: 0.1 xxxx xxxx xxxx 0.7 xxxx xxxx xxxx 3.5 xxxx
Shrd ConDel: 8.5 xxxx xxxx xxxx 19.5 xxxx xxxx xxxx 33.7 xxxx
Shared LOS: * * A * * A * * C * * D *
Approach Del: 19.5 33.7
Approach LOS: * * C D

Note: Queue reported is the number of cars per lane.

Peak Hour Delay Signal Warrant Report

Intersection #5 Birch St & Sheridan Ave

Future Volume Alternative: Peak Hour Warrant NOT Met
### Approach Matrix

<table>
<thead>
<tr>
<th>Movement</th>
<th>North Bound</th>
<th>South Bound</th>
<th>East Bound</th>
<th>West Bound</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>L - T - R</td>
<td>L - T - R</td>
<td>L - T - R</td>
<td>L - T - R</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Control</th>
<th>Lanes</th>
<th>Initial Vol</th>
<th>Approach Del</th>
</tr>
</thead>
<tbody>
<tr>
<td>Uncontrolled</td>
<td>0 0 1! 0 0</td>
<td>90 366 150</td>
<td>xxxxxxx</td>
</tr>
<tr>
<td>Stop Sign</td>
<td>0 1 0 1 0 0</td>
<td>10 40 10</td>
<td>19.5</td>
</tr>
</tbody>
</table>

**Approach (eastbound) [lanes=1] [control=Stop Sign]**

- Signal Warrant Rule #1: [vehicle-hours=0.3]
  - FAIL - Vehicle-hours less than 4 for one lane approach.
- Signal Warrant Rule #2: [approach volume=60]
  - FAIL - Approach volume less than 100 for one lane approach.
- Signal Warrant Rule #3: [approach count=4][total volume=960]
  - SUCCEED - Total volume greater than or equal to 800 for intersection with four or more approaches.

**Approach (westbound) [lanes=1] [control=Stop Sign]**

- Signal Warrant Rule #1: [vehicle-hours=1.6]
  - FAIL - Vehicle-hours less than 4 for one lane approach.
- Signal Warrant Rule #2: [approach volume=170]
  - SUCCEED - Approach volume greater than or equal to 100 for one lane approach.
- Signal Warrant Rule #3: [approach count=4][total volume=960]
  - SUCCEED - Total volume greater than or equal to 800 for intersection with four or more approaches.

---

**SIGNAL WARRANT DISCLAIMER**

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### Level Of Service Computation Report

#### 2000 HCM 4-Way Stop (Future Volume Alternative)

### Cumulative PM

#### Intersection #6: Ash St & California Ave

**Street Name:**
- **Ash St**
- **California Ave**

**Approach:**
- **North Bound**
- **South Bound**
- **East Bound**
- **West Bound**

**Movement:**
- **L - T - R**
- **L - T - R**
- **L - T - R**
- **L - T - R**

**Min. Green:**
- **North Bound:** 7 10 10 7 10 10 7 10 10
- **South Bound:**
- **East Bound:**
- **West Bound:**

**Volume Module:**
- **Base Vol:**
- **Growth Adj:**
- **Initial Base:**
- **Added Vol:**
- **Passer By Vol:**
- **Initial Fut:**
- **User Adj:**
- **PHF Adj:**
- **PHF Volume:**
- **Reduct Vol:**
- **Reduced Vol:**
- **PCE Adj:**
- **MLF Adj:**
- **Final Volume:**

**Saturation Flow Module:**
- **Adjustment:**
- **Lanes:**
- **Final Sat.:**

**Capacity Analysis Module:**
- **Vol/Sat:**
- **Crit Moves:**
- **Delay/Veh:**
- **Delay Adj:**
- **Adj Delay/Veh:**
- **LOS by Move:**
- **Approach Del:**
- **Delay Adj:**
- **Appr Adj Del:**

**Note:** Queue reported is the number of cars per lane.

---

**Peak Hour Volume Signal Warrant Report [Urban]**

---

**Intersection #6 Ash St & California Ave**

---
Future Volume Alternative: Peak Hour Warrant NOT Met

<table>
<thead>
<tr>
<th>Approach:</th>
<th>North Bound</th>
<th>South Bound</th>
<th>East Bound</th>
<th>West Bound</th>
</tr>
</thead>
<tbody>
<tr>
<td>Movement:</td>
<td>L - T - R</td>
<td>L - T - R</td>
<td>L - T - R</td>
<td>L - T - R</td>
</tr>
<tr>
<td>Control:</td>
<td>Stop Sign</td>
<td>Stop Sign</td>
<td>Stop Sign</td>
<td>Stop Sign</td>
</tr>
<tr>
<td>Lanes:</td>
<td>0 0 1! 0 0</td>
<td>0 0 0 0 0 0</td>
<td>0 0 1 0 1 0</td>
<td>0 1 0 0 0 0</td>
</tr>
<tr>
<td>Initial Vol:</td>
<td>50 40 0 0</td>
<td>0 0 180 40</td>
<td>40 200 0 0</td>
<td>0</td>
</tr>
</tbody>
</table>

| Major Street Volume: | 460 |
| Minor Approach Volume: | 90  |
| Minor Approach Volume Threshold: | 552 |

SIGNAL WARRANT DISCLAIMER

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Intersection #6: Ash St & California Ave

Level Of Service Computation Report
2000 HCM 4-Way Stop (Future Volume Alternative)
Cumulative+Project PM

Street Name: Ash St California Ave
Approach: North Bound South Bound East Bound West Bound
Movement: L - T - R L - T - R L - T - R L - T - R
Min. Green: 7 10 10 7 10 10 7 10 10
Volume Module:
Base Vol: 50 0 40 0 0 0 0 180 40 40 200 0
Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse: 50 0 40 0 0 0 0 180 40 40 200 0
Added Vol: 9 0 0 0 0 0 0 24 0 0 33 0
PasserByVol: 0 0 0 0 0 0 0 0 0 0 0 0
Initial Fut: 59 0 40 0 0 0 0 204 40 40 233 0
User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Volume: 59 0 40 0 0 0 0 204 40 40 233 0
Reduct Vol: 59 0 40 0 0 0 0 204 40 40 233 0
PCE Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
FinalVolume: 59 0 40 0 0 0 0 204 40 40 233 0

Saturation Flow Module:
Adjustment: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Lanes: 0.60 0.00 0.40 0.00 0.00 0.00 0.00 1.00 1.00 0.15 0.85 0.00
Final Sat.: 407 0 276 0 0 0 0 715 831 114 665 0

Capacity Analysis Module:
Vol/Sat: 0.14 xxxx 0.14 xxxx xxxx xxxx xxxx 0.29 0.05 0.35 0.35 xxxx
Crit Moves: **** **** ****
Delay/Veh: 8.6 0.0 8.6 0.0 0.0 0.0 0.0 9.6 7.2 9.9 9.9 0.0
Delay Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
AdjDel/Veh: 8.6 0.0 8.6 0.0 0.0 0.0 0.0 9.6 7.2 9.9 9.9 0.0
LOS by Move: A * A * * * A A A A
ApproachDel: 8.6 xxxxxx 9.2 9.9
Delay Adj: 1.00 xxxxx 1.00 1.00
ApprAdjDel: 8.6 xxxxxx 9.2 9.9
Los by Appr: A A
AllWayAvgQ: 0.1 0.1 0.1 0.0 0.0 0.0 0.0 0.0 0.5 0.5 0.5 0.5
Note: Queue reported is the number of cars per lane.

Peak Hour Volume Signal Warrant Report [Urban]

Intersection #6 Ash St & California Ave

Traffic 8.0.0715 Copyright (c) 2008 Dowling Associates, Inc. Licensed to FEHR & PEERS WALNUT CRK
Future Volume Alternative: Peak Hour Warrant NOT Met

<table>
<thead>
<tr>
<th>Approach:</th>
<th>North Bound</th>
<th>South Bound</th>
<th>East Bound</th>
<th>West Bound</th>
</tr>
</thead>
<tbody>
<tr>
<td>Movement:</td>
<td>L - T - R</td>
<td>L - T - R</td>
<td>L - T - R</td>
<td>L - T - R</td>
</tr>
<tr>
<td>Control:</td>
<td>Stop Sign</td>
<td>Stop Sign</td>
<td>Stop Sign</td>
<td>Stop Sign</td>
</tr>
<tr>
<td>Lanes:</td>
<td>0 0 1! 0 0 0 0 0 0</td>
<td>0 0 1 0 1 0 1 0 0 0</td>
<td>0 0 1 0 0 0 0 0 0</td>
<td></td>
</tr>
<tr>
<td>Initial Vol:</td>
<td>59 0 40 0 0 0 0 204 40 40 233 0</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Major Street Volume: 517
Minor Approach Volume: 99
Minor Approach Volume Threshold: 512

SIGNAL WARRANT DISCLAIMER
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**Level Of Service Computation Report**

2000 HCM Operations (Future Volume Alternative)

Cumulative PM

### Intersection #7: ECR & Cambridge Ave

**Final Vol:**

<table>
<thead>
<tr>
<th>Lanes:</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>0</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Final Vol:</td>
<td>40</td>
<td>2090***</td>
<td>80</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Signal=Protect/Rights=Include**

**Cycle Time (sec):** 150

**Loss Time (sec):** 12

**Critical V/C:** 0.530

**Avg Crit Del (sec/veh):** 15.5

**Avg Delay (sec/veh):** 18.7

**LOS:** B-

---

**Street Name:**

**ECR**

**Cambridge Ave**

**Approach:**

<table>
<thead>
<tr>
<th>North Bound</th>
<th>South Bound</th>
<th>East Bound</th>
<th>West Bound</th>
</tr>
</thead>
<tbody>
<tr>
<td>L - T - R</td>
<td>L - T - R</td>
<td>L - T - R</td>
<td>L - T - R</td>
</tr>
</tbody>
</table>

**Min. Green:**

| 7 | 10 | 10 |

**Y+R:**

| 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 |

---

**Volume Module:**

**Base Vol:**

| 30 | 1470 | 40 | 80 | 2090 | 40 | 110 | 20 | 40 | 80 | 50 | 160 |

**Growth Adj:**

| 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Initial Bse:**

| 30 | 1470 | 40 | 80 | 2090 | 40 | 110 | 20 | 40 | 80 | 50 | 160 |

**Added Vol:**

| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

**PasserByVol:**

| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

**Initial Fut:**

| 30 | 1470 | 40 | 80 | 2090 | 40 | 110 | 20 | 40 | 80 | 50 | 160 |

**User Adj:**

| 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**PHF Adj:**

| 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**PHF Volume:**

| 30 | 1470 | 40 | 80 | 2090 | 40 | 110 | 20 | 40 | 80 | 50 | 160 |

**Reduced Vol:**

| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

**PCE Adj:**

| 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**MLF Adj:**

| 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**FinalVolume:**

| 30 | 1470 | 40 | 80 | 2090 | 40 | 110 | 20 | 40 | 80 | 50 | 160 |

---

**Saturation Flow Module:**

**Sat/Lane:**

| 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |

**Adjustment:**

| 0.92 | 1.00 | 0.92 | 1.00 | 0.92 | 1.00 | 0.92 | 1.00 | 0.92 | 1.00 | 0.92 | 1.00 |

**Lanes:**

| 1.00 | 2.91 | 0.09 | 1.00 | 2.94 | 0.06 | 0.65 | 0.11 | 0.24 | 0.63 | 0.37 | 1.00 |

**Final Sat.:**

| 1750 | 5536 |   151 | 1750 | 5584 |   107 | 1143 |   208 |   416 | 1111 | 694 | 1750 |

---

**Capacity Analysis Module:**

**Vol/Sat:**

| 0.02 | 0.27 | 0.27 | 0.05 | 0.37 | 0.37 | 0.10 | 0.10 | 0.10 | 0.07 | 0.07 | 0.09 |

**Crit Moves:**

| **** | **** | **** | **** |

**Green Time:**

| 7.0 | 94.6 | 94.6 | 16.6 | 104 | 104.2 | 26.8 | 26.8 | 26.8 | 26.8 | 26.8 | 26.8 |

**Volume/Cap:**

| 0.37 | 0.42 | 0.42 | 0.41 | 0.54 | 0.54 | 0.54 | 0.54 | 0.54 | 0.40 | 0.40 | 0.51 |

**Uniform Del:**

| 69.4 | 13.9 | 13.9 | 62.1 | 11.2 | 11.2 | 56.0 | 56.0 | 56.0 | 56.0 | 54.5 | 54.5 |

**IncremntDel:**

| 2.8 | 0.1 | 1.4 | 0.1 | 0.1 | 1.9 | 1.9 | 1.9 | 0.8 | 0.8 | 1.4 |

**InitQueuDel:**

| 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |

**Delay Adj:**

| 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Delay/Veh:**

| 72.1 | 14.0 | 14.0 | 63.6 | 11.3 | 11.3 | 57.8 | 57.8 | 57.8 | 57.8 | 57.8 | 57.8 |

**User DelAdj:**

| 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**AdjDel/Veh:**

| 72.1 | 14.0 | 14.0 | 63.6 | 11.3 | 11.3 | 57.8 | 57.8 | 57.8 | 57.8 | 57.8 | 57.8 |

**LOS by Move:**

| E    | B   | B   | B+  | B+  | E+   | E+   | E+   | E+   | E+   | E+   | E+   |

**HCM2kAvgQ:**

| 1 | 11 | 11 | 4 | 16 | 16 | 8 | 8 | 8 | 6 | 6 | 8 |

**Note:** Queue reported is the number of cars per lane.
### Level Of Service Computation Report

#### 2000 HCM Operations (Future Volume Alternative)

**Cumulative+Project PM**

**Intersection #7: ECR & Cambridge Ave**

#### Final Vol:

<table>
<thead>
<tr>
<th>Lanes:</th>
<th>40</th>
<th>0</th>
<th>1</th>
<th>2097***</th>
<th>80</th>
</tr>
</thead>
</table>

**Signal=Protect/Rights=Include**

<table>
<thead>
<tr>
<th>Loss Time (sec):</th>
<th>150</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Final Vol:</th>
<th>110</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>0</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>20***</th>
<th>1</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>11</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>0</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Avg Delay (sec/veh):</th>
<th>18.7</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Lanes:</th>
<th>40</th>
<th>0</th>
</tr>
</thead>
</table>

**Street Name:**

- ECR
- Cambridge Ave

**Approach:**

- North Bound
- South Bound
- East Bound
- West Bound

**Movement:**

<table>
<thead>
<tr>
<th>L - T - R</th>
<th>L - T - R</th>
<th>L - T - R</th>
<th>L - T - R</th>
</tr>
</thead>
</table>

**Min. Green:**

- 7
- 10
- 10
- 7
- 10
- 10
- 7
- 10
- 10

**Y+R:**

- 4.0
- 4.0
- 4.0
- 4.0
- 4.0
- 4.0
- 4.0
- 4.0
- 4.0

**Volume Module:**

- **Base Vol:** 30 1470 40 2097 80 110 20 40 80 50 160
- **Growth Adj:** 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
- **Initial Bse:** 30 1470 40 2097 80 110 20 40 80 50 160
- **Added Vol:** 0 7 0 0 7 0 0 0 0 0 0
- **PasserByVol:** 0 0 0 0 0 0 0 0 0 0 0
- **Initial Fut:** 30 1477 40 2097 80 110 20 40 80 50 160
- **User Adj:** 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
- **PHF Adj:** 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
- **PHF Volume:** 30 1477 40 2097 80 110 20 40 80 50 160
- **Reduced Vol:** 0 7 0 0 7 0 0 0 0 0 0
- **PCE Adj:** 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
- **MLF Adj:** 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
- **FinalVolume:** 30 1477 40 2097 80 110 20 40 80 50 160

**Saturation Flow Module:**

- **Sat/Lane:** 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900
- **Adjustment:** 0.92 1.00 0.92 0.92 1.00 0.92 0.92 1.00 0.92 0.92 1.00
- **Lanes:** 1.00 2.91 0.09 1.00 2.94 0.06 0.65 0.11 0.24 0.63 0.37
- **Final Sat.:** 1750 5537 150 1750 5584 107 1143 208 416 1111 694 1750

**Capacity Analysis Module:**

- **Vol/Sat:** 0.02 0.27 0.27 0.05 0.38 0.38 0.10 0.10 0.10 0.07 0.07 0.09
- **Crit Moves:** **** **** ****
- **Green Time:** 7.0 94.7 94.7 16.6 104 104.3 26.7 26.7 26.7 26.7 26.7 26.7
- **Volume/Cap:** 0.37 0.42 0.42 0.41 0.54 0.54 0.54 0.54 0.54 0.40 0.40 0.51
- **Uniform Del:** 69.4 13.9 13.9 62.2 11.2 11.2 56.1 56.1 56.1 56.1 56.1 56.1
- **IncremrntDel:** 2.8 0.1 0.1 1.4 0.2 0.2 1.9 1.9 1.9 0.8 0.8 1.5
- **InitQueuDel:** 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0
- **Delay Adj:** 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
- **Delay/Veh:** 72.1 14.0 14.0 63.6 11.3 11.3 57.9 57.9 57.9 57.9 57.9 57.9
- **User DelAdj:** 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
- **AdjDel/Veh:** 72.1 14.0 14.0 63.6 11.3 11.3 57.9 57.9 57.9 57.9 57.9 57.9
- **LOS by Move:** E+ B+ E+ B+ E+ E+ E+ E+ E+ E+ E+
- **HCM2kAvgQ:** 1 11 11 4 16 16 8 8 8 6 6 8

Note: Queue reported is the number of cars per lane.
### Level Of Service Computation Report

2000 HCM Operations (Future Volume Alternative)

**Cumulative PM**

**Intersection #8: ECR & California Ave**

<table>
<thead>
<tr>
<th>Final Vol:</th>
<th>Lanes:</th>
<th>Signal=Protect/Rights=Include</th>
</tr>
</thead>
<tbody>
<tr>
<td>70</td>
<td>1 0 1 0</td>
<td></td>
</tr>
<tr>
<td>2070***</td>
<td>2 0 1 0</td>
<td></td>
</tr>
<tr>
<td>91</td>
<td>0 1</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Final Vol:</th>
<th>Lanes:</th>
<th>Signal=Protect/Rights=Include</th>
</tr>
</thead>
<tbody>
<tr>
<td>130</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>80***</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>1 0 2 0</td>
<td></td>
</tr>
<tr>
<td>140</td>
<td>0</td>
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<th>Vol Cnt Date:</th>
<th>n/a</th>
<th>Cycle Time (sec):</th>
<th>150</th>
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<td>Loss Time (sec):</td>
<td>12</td>
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<tr>
<th>Critical V/C:</th>
<th>0.654</th>
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<tr>
<td>Avg Crit Del (sec/veh):</td>
<td>29.4</td>
</tr>
<tr>
<td>Avg Delay (sec/veh):</td>
<td>29.4</td>
</tr>
</tbody>
</table>

| LOS:  | 0     |

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<th>Street Name:</th>
<th>ECR</th>
<th>California Ave</th>
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</table>

<table>
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<tr>
<th>Approach:</th>
<th>North Bound</th>
<th>South Bound</th>
<th>East Bound</th>
<th>West Bound</th>
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<tr>
<td>Movement:</td>
<td>L - T - R</td>
<td>L - T - R</td>
<td>L - T - R</td>
<td>L - T - R</td>
</tr>
<tr>
<td>Min. Green:</td>
<td>7 10 10 7 10 10 7 10 10 7 10 10</td>
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<td></td>
<td></td>
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<tr>
<td>Y+R:</td>
<td>4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0</td>
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<tr>
<th>Volume Module:</th>
<th>Base Vol: 80 1350 100</th>
<th>Growth Adj: 1.00</th>
<th>Initial Bse: 80 1350 100</th>
<th>Added Vol: 0 0 0 0 0 0 0 0</th>
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<tbody>
<tr>
<td>User Adj: 1.00</td>
<td>1.00 1.00 1.00 1.00 1.00</td>
<td>1.00 1.00 1.00 1.00 1.00</td>
<td>1.00 1.00 1.00 1.00 1.00</td>
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<tr>
<td>PCH Adj: 1.00</td>
<td>1.00 1.00 1.00 1.00 1.00</td>
<td>1.00 1.00 1.00 1.00 1.00</td>
<td>1.00 1.00 1.00 1.00 1.00</td>
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<tr>
<td>PCH Volume: 80</td>
<td>1350 100</td>
<td>91 2070</td>
<td>70</td>
<td>130 80 140 100 40 80</td>
</tr>
<tr>
<td>Reduced Vol: 80</td>
<td>1350 100</td>
<td>91 2070</td>
<td>70</td>
<td>130 80 140 100 40 80</td>
</tr>
<tr>
<td>PCE Adj: 1.00</td>
<td>1.00 1.00 1.00 1.00 1.00</td>
<td>1.00 1.00 1.00 1.00 1.00</td>
<td>1.00 1.00 1.00 1.00 1.00</td>
<td>1.00 1.00 1.00 1.00 1.00</td>
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<tr>
<td>MLP Adj: 1.00</td>
<td>1.00 1.00 1.00 1.00 1.00</td>
<td>1.00 1.00 1.00 1.00 1.00</td>
<td>1.00 1.00 1.00 1.00 1.00</td>
<td>1.00 1.00 1.00 1.00 1.00</td>
</tr>
<tr>
<td>Final Volume: 80</td>
<td>1350 100</td>
<td>91 2070</td>
<td>70</td>
<td>130 80 140 100 40 80</td>
</tr>
</tbody>
</table>

| Capacity Analysis Module: | Vol/Sat: 0.05 0.26 0.26 0.05 0.38 0.38 0.07 0.12 0.12 0.06 0.02 0.05 |
|---------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| Green Time: 10.5 80.5 80.5 16.4 86.4 86.4 21.7 28.0 28.0 13.1 19.5 19.5 |
| Volume/Cap: 0.65 0.48 0.48 0.48 0.65 0.65 0.51 0.65 0.65 0.65 0.16 0.35 |
| Uniform Del: 68.0 21.6 21.6 62.8 21.6 21.6 59.3 56.5 56.5 66.2 58.0 59.5 |
| Incremnt Del: 12.0 0.1 0.1 19.0 0.5 0.5 1.8 4.6 4.6 9.7 0.3 0.9 |
| InitQueu Del: 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 |
| Delay Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 |
| Delay/Veh: 80.0 21.7 21.7 64.7 22.1 22.1 61.1 61.1 61.1 76.0 58.3 60.5 |
| User Del/Avg: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 |
| AdjDel/Veh: 80.0 21.7 21.7 64.7 22.1 22.1 61.1 61.1 61.1 76.0 58.3 60.5 |
| LOS by Move: F C+ C+ E C+ C+ E E E- E+ E |
| HCM2kAvgQ: 5 14 14 4 22 22 6 11 11 6 2 4 |

Note: Queue reported is the number of cars per lane.
Level Of Service Computation Report
2000 HCM Operations (Future Volume Alternative)
Cumulative+Project PM

Intersection #8: ECR & California Ave

Final Vol: 70 2070*** 98
Lanes: 0 1 2 0 1

Final Vol: 130 80***
Lanes: 1 0 2 0 0

Final Vol: 80***
Lanes: 1 3 0 1 0

Final Vol: 140****
Lanes: 0 2 1 0 0

Street Name: ECR                         California Ave
Approach:    North Bound  South Bound  East Bound  West Bound
Movement:    L - T - R  L - T - R  L - T - R  L - T - R
Min. Green:  7 10 10 10 7 10 10 7 10 10
Y+R:         4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0

Volume Module:
Base Vol:    80 1350 100 91 2070 70 130 80 140 100 40 80
Growth Adj:  1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse: 80 1350 100 91 2070 70 130 80 140 100 40 80
Added Vol:   0 0 0 7 0 0 0 0 8 0 7
PasserByVol: 0 0 0 0 0 0 0 0 0 0
Initial Fut: 80 1350 100 98 2070 70 130 80 140 108 40 87
User Adj:    1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj:     1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Volume:  80 1350 100 98 2070 70 130 80 140 87 80 87
Reduced Vol: 0 0 0 0 0 0 0 0 0 0
PCE Adj:     1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
MLF Adj:     1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Final Volume:80 1350 100 98 2070 70 130 80 140 108 40 87

Saturation Flow Module:
Sat/Lane:    1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900
Adjustment: 0.92 0.92 0.92 0.92 0.92 0.92 0.92 0.92 0.92 0.92 0.92
Lanes:      1.00 1.00 1.00 0.22 1.00 2.89 0.11 1.00 0.34 1.00 1.00
Final Sat.: 1750 5276 391 1750 5498 186 1750 655 1147 1750 1900

Capacity Analysis Module:
Vol/Sat:     0.05 0.26 0.26 0.06 0.38 0.38 0.07 0.12 0.12 0.06 0.02 0.05
Crit Moves: **** **** **** ****
Green Time: 10.4 78.9 78.9 17.3 85.7 85.7 22.1 27.8 27.8 14.1 19.8 19.8
Volume/Cap: 0.66 0.49 0.49 0.49 0.66 0.66 0.51 0.66 0.66 0.66 0.16 0.38
Uniform Del: 68.1 22.7 22.7 62.2 22.1 22.1 58.9 56.7 56.7 65.7 57.7 59.5
IncremmntDel:12.5 0.1 0.1 1.8 0.5 0.5 1.6 4.8 4.8 9.5 0.3 1.0
InitQueuDel: 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0
Delay Adj:  1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Delay/Veh:  80.6 22.8 22.8 64.1 22.6 22.6 60.6 61.5 61.5 75.1 58.0 60.5
User DelAdj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
AdjDel/Veh: 80.6 22.8 22.8 64.1 22.6 22.6 60.6 61.5 61.5 75.1 58.0 60.5
LOS by Move: F C+ C+ E C+ C+ E E E E+ E
HCM2kAvgQ: 5 14 14 4 22 22 6 11 11 6 2 4
Note: Queue reported is the number of cars per lane.
Level Of Service Computation Report
2000 HCM Operations (Future Volume Alternative)
Cumulative PM

Intersection #9: El Camino Real & Page Mill Rd

<table>
<thead>
<tr>
<th>Final Vol:</th>
<th>320</th>
<th>1470</th>
<th>560***</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lanes:</td>
<td>2</td>
<td>3</td>
<td>2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Final Vol:</th>
<th>400</th>
<th>1700***</th>
<th>210</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lanes:</td>
<td>2</td>
<td>2</td>
<td>1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Final Vol:</th>
<th>320</th>
<th>860***</th>
<th>250</th>
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</thead>
<tbody>
<tr>
<td>Lanes:</td>
<td>2</td>
<td>2</td>
<td>1</td>
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Street Name: El Camino Real

<table>
<thead>
<tr>
<th>Approach:</th>
<th>North Bound</th>
<th>South Bound</th>
<th>East Bound</th>
<th>West Bound</th>
</tr>
</thead>
<tbody>
<tr>
<td>Movement:</td>
<td>L - T - R</td>
<td>L - T - R</td>
<td>L - T - R</td>
<td>L - T - R</td>
</tr>
<tr>
<td>Min. Green:</td>
<td>7 30 0</td>
<td>7 30 0</td>
<td>7 28 28 7 30 0</td>
<td></td>
</tr>
<tr>
<td>Y+R:</td>
<td>4.0 4.0 4.0 4.0</td>
<td>4.0 4.0 4.0 4.0</td>
<td>4.0 4.0 4.0 4.0</td>
<td></td>
</tr>
</tbody>
</table>

Volume Module:

| Base Vol: | 280 860 250 560 1470 320 400 1310 320 370 890 210 |
| Growth Adj: | 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 |
| Initial Bse: | 280 860 250 560 1470 320 400 1310 320 370 890 210 |
| Added Vol: | 0 0 0 0 0 0 0 0 0 0 0 0 |
| PasserByVol: | 0 0 0 0 0 0 0 0 0 0 0 0 |
| Initial Fut: | 280 860 250 560 1470 320 400 1310 320 370 890 210 |
| User Adj: | 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 |
| PHF Adj: | 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 |
| PHF Volume: | 280 860 250 560 1470 320 400 1310 320 370 890 210 |
| PHF: | 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 |
| Critical V/C: | 0.961 2 890 |
| Avg Crit Del (sec/veh): | 68.3 0 |
| Avg Delay (sec/veh): | 56.4 2 370*** |
| LOS: | E+ |

Saturation Flow Module:

| Sat/Lane: | 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 |
| Adjustment: | 0.83 1.00 0.97 0.83 1.00 0.97 0.83 1.00 0.92 0.69 1.00 0.97 |
| Lanes: | 2.00 2.31 0.69 2.00 3.00 1.00 2.00 2.00 1.00 2.00 2.00 1.00 |
| Final Sat.: | 3150 4388 1276 3150 5700 1847 3150 3800 1750 2625 3800 1847 |

Capacity Analysis Module:

| Vol/Sat: | 0.09 0.20 0.20 0.18 0.26 0.17 0.13 0.34 0.18 0.14 0.23 0.11 |
| Crit Moves: | **** **** **** **** |
| Green Time: | 13.4 30.0 30.0 22.2 38.8 38.8 21.0 43.1 43.1 17.6 39.7 39.7 |
| Volume/Cap: | 0.83 0.82 0.82 1.00 0.83 0.56 0.75 1.00 0.53 1.00 0.74 0.36 |
| Uniform Del: | 54.7 44.9 44.9 51.4 40.0 35.9 49.5 40.9 32.8 53.7 38.0 32.8 |
| IncremntDel: | 20.5 5.5 5.5 37.8 4.7 3.9 9.6 24.7 3.3 46.6 4.0 1.7 |
| InitQueuDel: | 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 |
| Delay Adj: | 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 |
| Delay/Veh: | 75.2 50.4 50.4 89.2 44.7 39.8 59.2 65.6 36.1 100.2 42.0 34.5 |
| User DelAdj: | 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 |
| AdjDel/Veh: | 75.2 50.4 50.4 89.2 44.7 39.8 59.2 65.6 36.1 100.2 42.0 34.5 |
| LOS by Move: | E- D D F D D E+ E D+ F D C- |
| HCM2kAvgQ: | 9 16 16 18 20 11 10 32 11 13 16 7 |

Note: Queue reported is the number of cars per lane.
Intersection #9: El Camino Real & Page Mill Rd

Street Name: El Camino Real  Page Mill Rd

Approach: North Bound  South Bound  East Bound  West Bound

Movement:

<table>
<thead>
<tr>
<th>Movement</th>
<th>L - T - R</th>
<th>L - T - R</th>
<th>L - T - R</th>
<th>L - T - R</th>
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</thead>
<tbody>
<tr>
<td>Min. Green:</td>
<td>7 30 0</td>
<td>7 30 0</td>
<td>7 28 27 30 0</td>
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</tr>
<tr>
<td>Y+R:</td>
<td>4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0</td>
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</table>

Volume Module:

<table>
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<tr>
<th>Volume Module</th>
<th>Base Vol</th>
<th>Growth Adj</th>
<th>Initial Bse</th>
<th>Added Vol</th>
<th>PasserByVol</th>
<th>Initial Fut</th>
<th>User Adj</th>
<th>PHF Adj</th>
<th>PHF Volume</th>
<th>Reduced Vol</th>
<th>PCE Adj</th>
<th>Final Volume</th>
</tr>
</thead>
<tbody>
<tr>
<td>Base Vol:</td>
<td>280 860 250 560 1470 320 400 1310 320 370 890 210</td>
<td></td>
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<tr>
<td>Growth Adj:</td>
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<tr>
<td>Initial Bse:</td>
<td>280 860 250 560 1470 320 400 1310 320 370 890 210</td>
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<tr>
<td>Added Vol:</td>
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<tr>
<td>PasserByVol:</td>
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</tr>
<tr>
<td>Initial Fut:</td>
<td>280 869 250 568 1470 320 403 1312 320 380 895 210</td>
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<tr>
<td>User Adj:</td>
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<tr>
<td>PHF Adj:</td>
<td>1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00</td>
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</tr>
<tr>
<td>PHF Volume:</td>
<td>280 869 250 568 1470 320 403 1312 320 380 895 210</td>
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</tr>
<tr>
<td>Reduced Vol:</td>
<td>280 869 250 568 1470 320 403 1312 320 380 895 210</td>
<td></td>
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<tr>
<td>PCE Adj:</td>
<td>1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00</td>
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<tr>
<td>MLP Adj:</td>
<td>1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00</td>
<td></td>
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</tr>
<tr>
<td>Final Volume:</td>
<td>280 869 250 568 1470 320 403 1312 320 380 895 210</td>
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<td></td>
</tr>
</tbody>
</table>

Saturation Flow Module:

| Sat/Lane: | 1900 1900 1900 1900 1900 1900 1900 1900 |
| Adjustment: | 0.83 1.00 0.97 0.83 1.00 0.97 0.83 1.00 |
| Lanes: | 2.00 2.31 0.69 2.00 3.00 1.00 2.00 2.00 |
| Final Sat.: | 3150 4398 1265 3150 5700 1847 3150 3800 1750 2625 3800 1847 |

Capacity Analysis Module:

| Vol/Sat: | 0.09 0.20 0.20 0.18 0.26 0.17 0.13 0.35 0.18 0.14 0.24 0.11 |
| Crit Moves: | E- D D F D D E+ E D+ F D C- |
| Green Time: | 13.4 30.0 30.0 22.3 38.9 38.9 21.1 42.7 42.7 17.9 39.6 39.6 |
| Volume/Cap: | 0.83 0.82 0.82 1.01 0.83 0.82 0.76 1.01 0.53 1.01 0.74 0.36 |
| Uniform Del: | 54.7 45.0 45.0 51.3 39.9 35.9 49.5 41.1 33.1 53.5 38.2 32.9 |
| Increment Delay: | 20.3 5.8 5.8 40.3 4.6 3.9 9.7 27.3 3.4 48.8 4.2 1.7 |
| Init Queue Delay: | 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.1 0.0 |
| Delay Adj: | 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 |
| Delay/Veh: | 75.0 50.7 50.7 91.7 44.6 39.7 59.3 68.5 36.5 102.3 42.4 34.6 |
| HCM2kAvgQ: | 9 16 17 19 20 11 11 32 11 13 16 7 |

Note: Queue reported is the number of cars per lane.
Intersection #10: PAGEMILL-OREGON EXPWY/MIDDLEFIELD RD

Final Vol: 130 1 570*** 1 60
Lanes: 0 1 0 1 0

Final Vol: 140 0 0 1 60
Lanes: 1 0 1 0 1

Final Vol: 1300*** 2 0 0 0 0
Lanes: 1 0 0 0 0 1

Final Vol: 260 0 0 1 220***
Lanes: 0 1 0 1 1

Approach: North Bound        South Bound        East Bound        West Bound
Movement:  L - T - R         L - T - R         L - T - R         L - T - R

Min. Green: 7 10 10 7 10 10 7 10 10 7 10 10
Y+R: 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0

Volume Module:
Base Vol: 240 510 140 60 570 130 140 1300 260 220 970 60
Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse: 240 510 140 60 570 130 140 1300 260 220 970 60
Added Vol: 0 0 0 0 0 0 0 0 0 0 0 0
PasserByVol: 0 0 0 0 0 0 0 0 0 0 0 0
Initial Fut: 240 510 140 60 570 130 140 1300 260 220 970 60
User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Volume: 240 510 140 60 570 130 140 1300 260 220 970 60
Reduced Vol: 240 510 140 60 570 130 140 1300 260 220 970 60
Final Volume: 240 510 140 60 570 130 140 1300 260 220 970 60

Saturation Flow Module:
Sat/Lane: 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900
Adjustment: 0.92 0.92 0.92 0.92 0.92 0.92 0.92 0.92 0.92 0.92 0.92 0.92
Lanes: 1.00 1.00 1.00 1.00 1.60 0.40 1.00 2.00 1.00 1.00 2.00 1.00
Final Sat.: 1750 1900 1750 1750 3046 695 1750 3800 1750 1750 3800 1750

Capacity Analysis Module:
Vol/Sat: 0.14 0.27 0.08 0.03 0.19 0.19 0.08 0.34 0.15 0.13 0.26 0.03
Crit Moves: **** **** **** ****
Green Time: 29.1 60.1 60.1 8.7 39.7 39.7 23.7 72.6 72.6 26.7 75.5 75.5
Volume/Cap: 0.85 0.80 0.85 0.71 0.85 0.85 0.85 0.85 0.85 0.37 0.85 0.61 0.08
Uniform Del: 73.3 54.6 43.4 84.4 67.3 67.3 73.8 48.7 37.7 74.7 40.7 31.4
IncremntDel: 25.9 10.4 1.0 39.8 27.9 27.9 77.9 27.7 1.5 27.7 13.7 2.0
InitQueuDel: 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0
Delay Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Delay/Veh: 99.2 65.0 44.4 124.2 77.9 77.9 85.2 54.8 39.1 102.4 42.4 31.6
User DelAdj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
AdjDel/Veh: 99.2 65.0 44.4 124.2 77.9 77.9 85.2 54.8 39.1 102.4 42.4 31.6
LOS by Move: E- D- F- E- F- D- F- D- C HCM2kAvgQ: 16 27 6 5 21 21 9 34 10 15 20 2
Note: Queue reported is the number of cars per lane.
Intersection #10: PAGEMILL-OREGON EXPWY/MIDDLEFIELD RD

**Approach:**
- **North Bound:** L - T - R
- **South Bound:** L - T - R
- **East Bound:** L - T - R
- **West Bound:** L - T - R

**Movement:**
- Min. Green:
  - 7 10 10 7 10 10 7 10 10 7 10 10
- **Y+R:**
  - 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0

**Volume Module:**
- **Base Vol:** 240 510 140 60 570 130 140 130 260 220 970 60
- **Growth Adj:** 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
- **Initial Bse:** 240 510 140 60 570 130 140 130 260 220 970 60
- **Added Vol:** 4 0 0 0 0 0 3 3 10 4 0 9 0
- **PasserByVol:** 0 0 0 0 0 0 0 0 0 0 0 0
- **Initial Fut:** 244 510 140 60 570 133 143 1310 264 220 979 60
- **User Adj:** 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
- **PHF Adj:** 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
- **PHF Volume:** 244 510 140 60 570 133 143 1310 264 220 979 60
- **Reduct Vol:** 0 0 0 0 0 0 0 0 0 0 0 0
- **Reduced Vol:** 244 510 140 60 570 133 143 1310 264 220 979 60
- **PCE Adj:** 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
- **MLF Adj:** 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
- **FinalVolume:** 244 510 140 60 570 133 143 1310 264 220 979 60

**Saturation Flow Module:**
- **Sat/Lane:** 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900
- **Adjustment:** 0.92 1.00 0.92 0.92 1.00 0.92 0.92 1.00 0.92 0.92 1.00 0.92
- **Lanes:** 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
- **Final Sat.:** 1750 1900 1750 1750 3032 707 1750 3800 1750 1750 3800 1750

**Capacity Analysis Module:**
- **Vol/Sat:** 0.14 0.27 0.08 0.03 0.19 0.19 0.08 0.34 0.15 0.13 0.26 0.03
- **Crit Moves:** **** **** **** ****
- **Green Time:** 29.4 60.2 60.2 8.7 39.6 39.6 23.9 72.6 72.6 26.5 75.2 75.2
- **Volume/Cap:** 0.85 0.80 0.24 0.71 0.85 0.85 0.62 0.85 0.37 0.85 0.62 0.08
- **Uniform Del:** 73.2 54.5 43.3 84.4 67.4 67.4 73.8 48.9 37.7 74.9 41.1 31.6
- **IncrmntDel:** 26.4 10.3 6.0 39.5 11.0 11.0 11.7 6.3 1.5 28.6 1.8 0.2
- **InitQueuDel:** 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0
- **Delay Adj:** 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
- **Delay/Veh:** 99.7 64.8 44.3 123.8 78.5 78.5 85.4 55.2 39.3 103.5 42.9 31.8
- **User Del Adj:** 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
- **AdjDel/Veh:** 99.7 64.8 44.3 123.8 78.5 78.5 85.4 55.2 39.3 103.5 42.9 31.8
- **LOS by Move:** F E D F+ E- E F+ D F D C
- **HCM2kAvgQ:** 16 27 6 5 21 21 9 34 11 15 21 2

Note: Queue reported is the number of cars per lane.