Executive Summary

Environmental Science Associates (ESA) has prepared this technical analysis to support the findings of the Final EIR prepared for the proposed hotel at 195 Hegenberger Road (SCH# 2014031004). The analysis responds to comments made at the public hearing on October 6, 2014, related to access and onsite vehicle circulation at 195 Hegenberger Road, where the proposed hotel would be located. Specifically, commenters at the public hearing requested further traffic analysis to address the following traffic and on-site circulation issues:

Issue #1 intersection levels of service at the unsignalized site access driveways on Hegenberger Road and Pardee Drive;

Issue #2 inbound right turns from Hegenberger Road onto the site access driveway;

Issue #3 vehicle stacking (queuing) at the Hegenberger Road driveway for outbound vehicles, and

Issue #4 safety concerns associated with increased traffic on the existing driveway that intersects with Pardee Drive and the adjacent existing driveway that serves as an exit driveway for Francesco’s Restaurant.

As described further below, this analysis found that the proposed project would not result in any new significant impacts and that the proposed project would not exacerbate any existing safety concerns or cause any safety deficiencies.

Technical Analysis

As described in Section 4.C, Transportation Circulation of the Draft EIR, vehicular access to the project site would be provided by recorded driveway easements from both Hegenberger Road and Pardee Drive. These driveways are the focus of this memorandum. The access driveway on Hegenberger Road (currently serving as access/egress to, among other uses, a Harley Davidson Store and the Carpenter Funds Administrative Offices) is
the fourth leg of the Hegenberger Road / Hegenberger Place intersection. Eastbound left turns from Hegenberger Road into the access driveway are prohibited (as are U-turns on the eastbound approach). The Pardee Drive driveway is a full-access driveway (i.e., no turning-movement restrictions), with the fourth leg of the intersection being an Entry-Only driveway for a post office. See Figure 1.

**Issues #1 Unsignalized Site Access Driveways: Level of Service (LOS) Conditions**

**Methodology**

The operation of a local roadway network is commonly measured and described using a grading system called Level of Service (LOS). The LOS grading system qualitatively characterizes traffic conditions associated with varying levels of vehicle traffic, ranging from LOS A (indicating free-flow traffic conditions with little or no delay experienced by motorists) to LOS F (indicating congested conditions where traffic flows exceed design capacity and result in long queues and delays). This LOS grading system applies to both signalized and unsignalized intersections. LOS A, B, and C are generally considered satisfactory service levels, while the influence of congestion becomes more noticeable (though still considered acceptable) at LOS D. LOS E and F are generally considered to be unacceptable. Table 1 defines the vehicle delay associated with each LOS for unsignalized intersections.

**Table 1**

<table>
<thead>
<tr>
<th>Level of Service</th>
<th>Average Delay Per Vehicle (Seconds)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>≤ 10.0</td>
<td>No delay for stop-controlled approaches.</td>
</tr>
<tr>
<td>B</td>
<td>10.1 to 15.0</td>
<td>Operations with minor delays.</td>
</tr>
<tr>
<td>C</td>
<td>15.1 to 25.0</td>
<td>Operations with moderate delays.</td>
</tr>
<tr>
<td>D</td>
<td>25.1 to 35.0</td>
<td>Operations with some delays.</td>
</tr>
<tr>
<td>E</td>
<td>35.1 to 50.0</td>
<td>Operations with high delays and long queues.</td>
</tr>
<tr>
<td>F</td>
<td>&gt; 50.0</td>
<td>Operation with extreme congestion, with very high delays and long queues unacceptable to most drivers.</td>
</tr>
</tbody>
</table>


**Analysis**

The study intersections were analyzed during weekday a.m. and p.m. peak-hour conditions, which typically occur during the morning and evening commute periods (7:00 a.m. to 9:00 a.m. and 4:00 p.m. to 6:00 p.m.). Manual turning movement counts were conducted at the study intersections during the two-hour peak periods in October 2014. Intersection operations were evaluated for the one hour during each two-hour period when the highest traffic volumes were measured. The raw count data are included in Attachment 1.
East

Francesco’s Restaurant

Exit Driveway

Proposed Hotel Access Driveway
(Pardee Drive)

195 Hegenberger Road
Proposed Hotel Location

Carpenter Funds
Administrative Offices

Proposed Hotel Access Driveway
(Hegenberger Road)

Francesco’s Restaurant

Exit Driveway

Hegenberger Loop

Comcast

Hegenberger Place

Figure 1 – 195 Hegenberger Road Hotel

1  Access Driveway LOS calculation and field observation location.
2  Access driveway LOS calculation
It is atypical as part of a California Environmental Quality Act analysis to calculate LOS for private driveways. Nevertheless, as both of the stop-sign-controlled driveway intersections to public streets are uncontrolled on the through movement (i.e., the public street), the unsignalized intersection LOS analysis methodology was applied, and every turn movement was analyzed. The LOS methodology for unsignalized intersections is based on the control delay\(^1\) for the stop-controlled (side-street) movement(s), as well as for left turns from the uncontrolled (major street) (e.g., Hegenberger Road) approaches, expressed in seconds per vehicle. Note that standard traffic analysis practice is to report the delay and LOS only for the movement/approach with the worst LOS at side-street stop-controlled intersections. In this case, the movement with the worst LOS is the left turn movement from the site access driveways onto the public street (Hegenberger Road and Pardee Drive). Therefore, the LOS for the right turn movements (inbound and outbound from both Hegenberger Road and Pardee Drive) are not discussed further in this memo.

As described on page 4.C-15 of the Draft EIR, the 16- to 18-foot-wide median on Hegenberger Road serves as a refuge for vehicles making two-stage left turns.\(^2\) As such, the LOS analysis uses a two-part turn to assess the operation of the Hegenberger Road driveway intersection.

**Existing Conditions**

**Calculated (Modeled) LOS**

As shown in Table 2, the calculated LOS for vehicles turning from the access driveway onto eastbound Hegenberger Road is LOS E for the first part of two-stage left turns and LOS C or better for the second part of the turns. The calculated LOS for vehicles turning from the access driveway onto Pardee Drive is LOS C or better. LOS calculation sheets are provided in Attachment 2.

<table>
<thead>
<tr>
<th>Study Intersection (unsignalized)</th>
<th>AM Peak Hour Delay</th>
<th>LOS</th>
<th>PM Peak Hour Delay</th>
<th>LOS</th>
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</thead>
<tbody>
<tr>
<td>1. Hegenberger Road Driveway</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Two-Stage Left Turn</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Part 1</td>
<td>37.7</td>
<td>E</td>
<td>49.7</td>
<td>E</td>
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<tr>
<td>Part 2</td>
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<td>C</td>
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<tr>
<td>2. Pardee Drive Driveway</td>
<td>14.1</td>
<td>B</td>
<td>16.7</td>
<td>C</td>
</tr>
</tbody>
</table>

\(^{a}\) The results presented in this table represent the LOS calculated by the TRAFFIX traffic analysis software program. See the text below for the professional engineering judgment of LOS based on field observations conducted during the a.m. and p.m. peak hours.

**SOURCE:** ESA, 2014

**Field Verification (Observed Traffic Movements)**

Following standard traffic analysis practices, intersection operations were observed during both the a.m. and p.m. peak hours in October 2014 to verify the calculated LOS findings and to note circulation patterns in and around the Project site. We observed conditions that did not match the LOS E (almost LOS F) calculated condition at the

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\(^{1}\) Control delay includes initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay.

\(^{2}\) A two-stage left turn is when drivers seek refuge in a median after crossing the first stream of traffic (e.g., the westbound traffic stream on Hegenberger Road) before crossing a second stream of traffic (e.g., the eastbound Hegenberger Road traffic stream).
Hegenberger Road driveway; observed delays by drivers are closer to 15 to 30 seconds versus the calculated average delays of 38 to 50 seconds. Drivers wishing to turn left onto Hegenberger Road were observed reacting and adapting to different patterns of Hegenberger Road traffic by either (1) making one fluid left turn (when simultaneous gaps in westbound and eastbound Hegenberger Road traffic streams occur); (2) making a two-stage left turn (when there is a gap in the westbound traffic stream, but not a simultaneous gap in the eastbound direction); or (3) making a right turn and then a U-turn at the opening in the Hegenberger Road median (about 400 feet to the west).

The existence of traffic signals on Hegenberger Road at Pardee Drive and Hegenberger Loop (upstream from the site access driveway in either direction) produces considerable platooning of traffic on Hegenberger Road. That is, there are times of waves of vehicles, and times of very little (or no) traffic in both directions. Drivers exiting the Hegenberger Road driveway were observed reacting to those varying situations in one of the above-mentioned three ways in order to lessen the delay they experienced to achieve their goal of travelling east on Hegenberger Road. During the field observations, a maximum of two vehicles was queued, waiting to exit onto Hegenberger Road; the access to parking spaces in front of the Harley Davidson Store was never blocked. In our professional engineering opinion, the observed worst-approach LOS is no worse than LOS D, i.e., acceptable.

**Existing Plus Project Conditions**

The trips generated by the proposed project were assigned to the Hegenberger Road and Pardee Drive driveways based on the directions of approach and departure discussed under trip distribution on page 4.C-11 of the Draft EIR. Specific to the driveways, the Draft EIR analysis assigned inbound trips originating east of the project site to the Hegenberger Road access driveway, with all other trips (inbound trips from points west of the project site, and all outbound trips) assigned to the Pardee Drive access driveway. For purposes on this analysis, however, the trip assignment was calculated to respond to a comment on the Final EIR that analysis should be conducted on an assumption that half of the outbound project trips would use the access driveway on Hegenberger Road to make an eastbound left turn (i.e., a 50/50 split would generate 10 and 14 eastbound left turns from the site access driveway onto Hegenberger Road during the a.m. and p.m. peak hours, respectively).

As shown in Table 3, the calculated LOS for vehicles making an eastbound left turn from the Hegenberger Road access driveway would remain unchanged under existing plus project conditions, except during the p.m. peak hour when the LOS for the first part of two-stage left turns is at LOS F. This decline is expected since it would only take a single additional left-turning vehicle to go from 49.7 seconds to greater than 50 seconds. LOS calculation sheets are provided in Attachment 2.

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3 A group of vehicles traveling together as a group, either voluntarily or involuntarily, because of traffic signal controls, geometrics, or other factors.

4 Some project traffic could be expected to exit onto Hegenberger Road from the site access driveway; however, to conservatively assess the project effects on level of service at the Pardee/Hegenberger intersection, the Draft EIR assigned all outbound peak-hour project traffic to the Pardee Drive driveway. Potential traffic safety impacts incurred by drivers making an eastbound left turn onto Hegenberger Road from the site access driveway were assessed in the Draft EIR, accounting for the above-acknowledged use of the driveway by some project-generated traffic.

5 Calculated delays do not correlate directly with increasing traffic volumes. Instead, when conditions are at LOS E or F, small changes in volume (i.e., a single additional car) have large effects on delay (i.e., delay increases exponentially, not linearly).
TABLE 3  
LEVELS OF SERVICE (LOS) AND WORST APPROACH DELAY (seconds per vehicle)  
EXISTING vs. EXISTING PLUS PROJECT CONDITIONSa

<table>
<thead>
<tr>
<th>Study Intersection (unsignalized)</th>
<th>Existing AM Peak Hour Delay</th>
<th>LOS</th>
<th>Existing PM Peak Hour Delay</th>
<th>Existing Plus Project AM Peak Hour Delay</th>
<th>Existing Plus Project PM Peak Hour Delay</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Hegenberger Road Driveway</td>
<td></td>
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<tr>
<td>Two-Stage Left Turn</td>
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<td></td>
<td></td>
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<tr>
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<td>37.7</td>
<td>E</td>
<td>49.7</td>
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<tr>
<td>2. Pardee Drive Driveway</td>
<td>14.1</td>
<td>B</td>
<td>16.7</td>
<td>C</td>
<td>15.8</td>
</tr>
</tbody>
</table>

a The results presented in this table represent the LOS calculated by the TRAFFIX traffic analysis software program. Refer to the text in this technical memorandum for the professional engineering judgment of LOS based on field observations conducted during the a.m. and p.m. peak hours.

SOURCE: ESA, 2014

Threshold of Significance

As described on page 4.C-8 of the Draft EIR, a project would have a significant impact at an unsignalized intersection if the project would 1) add ten or more vehicles to the critical movement and 2) would satisfy the California Manual on Traffic Control Devices (CA MUTCD) Peak Hour Volume Traffic Signal Warrant after project completion. Assuming a split of peak-hour outbound project trips at 50/50 between each site access driveway the project would add ten or more vehicles to the critical left turn movements onto Hegenberger Road. However, as described below, the peak-hour volumes after project completion would not satisfy the CA MUTCD signal warrant, and therefore, the project impact would be less than significant.

Traffic Signal Warrant Evaluation

A traffic signal warrant evaluation was conducted because the addition of project-related trips at the Hegenberger Road / site access driveway unsignalized intersection would add ten or more vehicles to the outbound left-turn movement. Whether there is a need for a traffic signal at an unsignalized intersection, (i.e., to change an unsignalized intersection to a signalized intersection) is evaluated according to a series of nine (Warrants 1 to 9) “traffic signal warrants,” as defined by the CA MUTCD.6

Warrant 3 is the Peak Hour Warrant and is intended for use at locations where traffic conditions are such that for a minimum of one hour of an average day, the minor street (i.e., Hegenberger Road access driveway) traffic suffers undue delay when entering or crossing the major street (i.e., Hegenberger Road). This warrant is satisfied when the criteria in either of the following two categories are met:

Category A. If all three of the following conditions exist for the same one hour (any four consecutive 15-minute periods) of an average day:

1. The total stopped time delay experienced by the traffic on one minor-street approach (one direction only) controlled by a STOP sign equals or exceeds: 4 vehicle-hours for a one-lane approach; and

2. The volume on the same minor-street approach (one direction only) equals or exceeds 100 vehicles per hour for one moving lane of traffic; and

3. The total entering volume serviced during the hour equals or exceeds 650 vehicles per hour for intersections with three approaches or 800 vehicles per hour for intersections with four or more approaches.

**Category B.** The plotted points representing the vehicles per hour on the major street (total of both approaches) and the corresponding vehicles per hour on the higher volume minor-street approach (one direction only) for one hour (any four consecutive 15-minute periods) of an average day fall above the curve in Figure 4C-3 Warrant 3, Peak Hour from the CA MUTCD (see Attachment 3) for the combination of approach lanes.

Because volumes on the site access driveway approach (eastbound left turn onto Hegenberger) during the a.m. and p.m. peak hours are 23 and 43 vehicles, respectively, which is less than the 100-vehicles minimum threshold and the vehicles per hour fall below the curve in Figure 4C-3 from CAMUTCD, Warrant 3 would **not** be satisfied in peak hour category A or B.

Application of the above-stated significance criterion for unsignalized intersection results in a less-than-significant impact for the unsignalized intersection at Hegenberger Road.

**Issue #2 Right Turns from Hegenberger Road into Site Access Driveway**

The commenter-cited concerns about traffic safety implications of drivers turning right from Hegenberger Road into the site access driveway was investigated during the above-described field observations. No adverse conditions (e.g., backups/delays or hazardous maneuvers on westbound Hegenberger Road related to right turns into the driveway) were observed. We observed that the distribution of vehicles across the three lanes on westbound Hegenberger Road appear to be allocated in the right-hand (curb) lane to the driveways on Hegenberger Road. Through-traffic vehicles tend to use the two lanes available to them. According to the Section 405.3 (Right-Turn Channelization) of the Caltrans Highway Design Manual (HDM), a deceleration lane for right-turning vehicles can be justified on the basis of capacity, analysis, and crash experience. Such a lane could be needed if there is a high volume of right-turning traffic causing backup and delay on the through lanes, or if there are frequent rear-end and sideswipe collisions involving right-turning vehicles. As stated above, no backups and delays were observed on westbound Hegenberger Road approaching the Hegenberger Road access driveway, and a check of reported collision in the California Highway Patrol database reveals no history of collisions that would justify installation of a deceleration lane on westbound Hegenberger Road. The Caltrans HDM also states that high-speed channelized right turns are generally inappropriate because they create conflicts with pedestrians and bicyclists and allow vehicles to turn at high speeds. Therefore, the potential impact is considered less than significant.

**Issue #3 Stacking at the Hegenberger Road Site Access Driveway for Outbound Vehicles**

As described above, a maximum queue of two vehicles was observed as drivers waited to exit onto Hegenberger Road from the Hegenberger Road site access driveway. The access to parking spaces in front of the Harley Davidson Store was never blocked. As stated above, the Draft EIR analysis assigned no outbound trips to the Hegenberger Road access driveway. For purposes of this supplemental analysis, however, the trip assignment was adjusted so that half of the outbound project trips would use each site access driveway. A 50/50 split would

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7 Caltrans, 2012. *Highway Design Manual (Chapter 400: Intersections At Grade; Section 405.3: Right-Turn Channelization).*
generate 10 to 14 eastbound left turns from the site access driveway onto Hegenberger Road (i.e., one vehicle every 4 to 6 minutes), a rate that in our professional engineering opinion would not substantially change the existing queue length conditions (i.e., approximately two cars). A potential project impact to onsite circulation caused by stacking of vehicles waiting to exit the Hegenberger Road access driveway is considered less than significant.

**Issue #4  Safety Concerns Related to the Pardee Drive Site Access Driveway and the Exit-Only Driveway for the Francesco’s Restaurant**

The commenter-cited opinion about traffic safety implications of conflicting traffic movements on the existing site access driveway and the adjacent driveway (exit only) for the Francesco’s Restaurant parking lot was investigated during the above-described field observations. No adverse conditions were observed. Also, it is not anticipated that there would be a high frequency of simultaneous turns from both driveways. If such a condition were to occur, the excellent sight distance available for both driveways, and expected “stop-and-proceed-when-safe” practices by drivers exiting the driveways, lessens potential traffic safety problems. In our professional engineering opinion, the project would not substantially change the existing conditions. The project impact is considered less than significant.

**Conclusion**

Based on the additional traffic analysis, ESA has determined that there are no additional significant impacts resulting from the project. Further, all the potential issues noted by the commenters reflect existing operating conditions. The proposed project would not exacerbate any existing traffic/circulation, and/or safety conditions.
Attachment 1

Traffic Turning Movement Counts
### ALL TRAFFIC DATA

City of Oakland  
All Vehicles on Unshifted  
Nothing on Bank 1  
Nothing on Bank 2  
(916) 771-8700  
e Name : 14-7677-001 Hegenberger Road-Hegenberger Place  
Date : 10/15/2014  
orders@atdtraffic.com  
Hegenberger Place  
Westbound  
Hegenberger Road  
Southbound  
Hegenberger Road  
Westbound  
Hegenberger Road  
Northbound  
Harley Davidson Driveway  
Eastbound  

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<td>START TIME</td>
<td>AM PEAK HOURS</td>
<td>Unshifted Count = All Vehicles</td>
<td></td>
</tr>
<tr>
<td>------------</td>
<td>---------------</td>
<td>-------------------------------</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Hegenberger Road</td>
<td>Hegenberger Place</td>
<td>Hegenberger Road</td>
</tr>
<tr>
<td></td>
<td>Southbound</td>
<td>Westbound</td>
<td>Northbound</td>
</tr>
<tr>
<td></td>
<td>LEFT</td>
<td>THRU</td>
<td>RIGHT</td>
</tr>
<tr>
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### PM PEAK HOURS

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<th>Harley Davidson Driveway</th>
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<td>Northbound</td>
<td>Eastbound</td>
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<tr>
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<td>THRU</td>
<td>RIGHT</td>
<td>APP.TOTAL</td>
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<td>3</td>
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<td>Post Office Driveway</td>
<td>Pardee Drive</td>
</tr>
<tr>
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<td>-----------------</td>
<td>--------------</td>
<td>----------------------</td>
<td>--------------</td>
</tr>
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<td>Westbound</td>
<td>Northbound (Inbound Only)</td>
<td>Eastbound</td>
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<td>THRU</td>
<td>RIGHT</td>
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<tr>
<td>17:15</td>
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Approach % 93.2% 0.0% 6.8% 16.0% 80.6% 3.4% 0.0% 0.0% 0.0% 2.1% 93.6% 4.3%

Total % 2.1% 0.0% 0.1% 2.2% 8.8% 44.5% 1.9% 55.2% 0.0% 0.0% 0.0% 0.0% 0.9% 39.8% 1.8% 42.6% 100.0%
## ALL TRAFFIC DATA

City of Oakland  
All Vehicles on Unshifted  
Francesco’s Driveway on Bank 1  
Nothing on Bank 2  

**Start Time**  
Left | Thru | Right | Total  
--- | --- | --- | ---  
8:00 | 1 | 0 | 0 | 1  
8:15 | 2 | 0 | 1 | 3  
8:30 | 1 | 0 | 0 | 1  
8:45 | 0 | 0 | 0 | 0  

**Total Volume**  
4 | 0 | 1 | 5  

**% App Total**  
80.0% | 0.0% | 20.0%  

**PHF**  
0.500 | 0.000 | 0.250 | 0.417

### AM PEAK HOURS

<table>
<thead>
<tr>
<th>TIME</th>
<th>Comcast Driveway Southbound</th>
<th>Pardee Drive Westbound</th>
<th>Post Office Driveway Northbound Only</th>
<th>Pardee Drive Eastbound</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>08:00</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>08:15</td>
<td>2</td>
<td>0</td>
<td>1</td>
<td>3</td>
<td>4</td>
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<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>11</td>
</tr>
</tbody>
</table>

**Total Volume**  
4 | 0 | 1 | 5  

**% App Total**  
80.0% | 0.0% | 20.0%  

**PHF**  
0.500 | 0.000 | 0.250 | 0.417

### PM PEAK HOURS

<table>
<thead>
<tr>
<th>TIME</th>
<th>Comcast Driveway Southbound</th>
<th>Pardee Drive Westbound</th>
<th>Post Office Driveway Northbound Only</th>
<th>Pardee Drive Eastbound</th>
<th>Total</th>
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<td>13</td>
<td>10</td>
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<td>4</td>
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<td>1</td>
<td>5</td>
<td>25</td>
</tr>
<tr>
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<td>18</td>
<td>0</td>
<td>1</td>
<td>19</td>
<td>18</td>
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</table>

**Total Volume**  
37 | 0 | 3 | 40  

**% App Total**  
92.5% | 0.0% | 7.5%  

**PHF**  
0.514 | 0.000 | 0.750 | 0.526

---

**Note:** Unshifted Count = All Vehicles
Attachment 2

Traffic Level of Service Calculations
AM Peak-Hour LOS Conditions
**Hegenberger Hotel**

**Intersection Level of Service (LOS) Analysis**

---

**Intersection #5 Hegenberger Rd and Hegenberger Pl - Drwy [Part 1 LTs]**

---

**Average Delay (sec/veh):** 0.6  
**Worst Case Level Of Service:** E[ 37.7]

---

**Street Name:** Hegenberger Road  
**Access Drwy - Hegenberger Place**

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

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

**Control:**
- Uncontrolled  
- Stop Sign

**Rights:**
- Include  
- Include  
- Include  
- Include

**Lanes:**
- 0  0  2  1  0  
- 1  0  2  1  0  
- 1  0  0  0  0  
- 0  0  1  0  0

---

**Volume Module:**

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<td>Rights:</td>
<td>Include</td>
<td>Include</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Volume Module:</th>
<th>Count Date: 15 Oct 2014 &lt;&lt; 8:00-9:00 AM</th>
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</thead>
<tbody>
<tr>
<td>Base Vol:</td>
<td>18 1182 13 13 0 0 3 0 11</td>
</tr>
<tr>
<td>Growth Adj:</td>
<td>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>0 0 0 0 0 0 0 0 0 0 0</td>
</tr>
<tr>
<td>User Adj:</td>
<td>0.96 0.96 0.96 0.96 0.96 0.96 0.96 0.96 0.96 0.96</td>
</tr>
<tr>
<td>PHF Volume:</td>
<td>19 1231 14 14 0 0 3 0 11</td>
</tr>
<tr>
<td>Reduct Vol:</td>
<td>0 0 0 0 0 0 0 0 0 0 0</td>
</tr>
<tr>
<td>Final Volume:</td>
<td>19 1231 14 14 0 0 3 0 11</td>
</tr>
</tbody>
</table>

**Critical Gap Module:**

| Critical Gap:   | 4.1 7.5 7.5 6.5 |
| FollowUpTim:    | 2.2 3.5 3.5 4.0 |

**Capacity Module:**

| Conflict Vol:  | 1276 448 1282 0 |
| Move Cap.:     | 1636 499 167 1091 |
| Volume/Cap.:   | 1636 495 165 1091 |
| Potent Cap.:   | 123 495 165 1091 |
| Move Cap.:     | 0.01 0.01 0.01 |
| Level Of Service Module: |

**LOS by Move:**
- LT - LTR - RT  
- LT - LTR - RT  
- LT - LTR - RT  
- LT - LTR - RT

**Movement:**
- LT - LTR - RT  
- LT - LTR - RT  
- LT - LTR - RT  
- LT - LTR - RT

**Shared Cap.:**
- 867 0.1

**Shared Queue:**
- 0.1

**Shared LOS:**
- 9.2

**Approach Del:**
- 37.7

**Approach LOS:**
- A

---

**Note:** Queue reported is the number of cars per lane.
### Intersection Level of Service (LOS) Analysis

#### Level Of Service Computation Report

2000 HCM Unsignalized Method (Future Volume Alternative)

**Intersection #5 Hegenberger Rd and Hegenberger Pl - Drwy [Part 1 LTs]**

**Average Delay (sec/veh):** 1.1  
**Worst Case Level Of Service:** E[ 44.1]

---

**Street Name:** Hegenberger Rd  
**Approach:** North Bound

**Movement:** L - T - R

<table>
<thead>
<tr>
<th>Control</th>
<th>Rights</th>
<th>Lanes</th>
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</thead>
<tbody>
<tr>
<td>Uncontrolled</td>
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</tbody>
</table>

**Volume Module:**

- **Count Date:** 15 Oct 2014 << 8:00-9:00 AM
- **Base Vol:** 0 0 0 18 1182 13 13 0 0 3 0 11
- **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:** 0 0 0 18 1182 13 13 0 0 3 0 11
- **Added Vol:** 0 7 0 0 0 0 0 0 0 0 0 0
- **PasserByVol:** 0 0 0 0 0 0 0 0 0 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:** 0.96 0.96 0.96 0.96 0.96 0.96 0.96 0.96 0.96 0.96 0.96 0.96
- **PHF Volume:** 0 7 0 19 1231 45 28 0 0 3 0 11
- **Reduct Vol:** 0 0 0 0 0 0 0 0 0 0 0 0
- **FinalVolume:** 0 7 0 19 1231 45 28 0 0 3 0 11

**Critical Gap Module:**

- **Critical Gp:** 4.1 7.5 7.5 6.5 6.9
- **FollowUpTim:** 2.2 3.5 3.5 4.0 3.3

**Capacity Module:**

- **Conflict Vol:** 7 1294 455 1321 2
- **Potent Cap.:** 1626 122 493 158 1087
- **Move Cap.:** 1626 120 489 156 1087
- **Volume/Cap:** 0.01 0.23 0.01 0.00 0.01

**Level Of Service Module:**

- **2Way95thQ:** 0.0 0.9 0.0 0.0 0.0
- **Control Del:** 44.1
- **Movement:** LT - LTR - RT

**Shared Cap.:** 861

**Shared Queue:** 0.1

**Shrd ConDel:** 9.3

**Shared LOS:** E

**ApproachDel:** 44.1

**ApproachLOS:** A

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

---

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Level Of Service Computation Report
2000 HCM Unsignalized Method (Base Volume Alternative)

Intersection #5 Hegenberger Rd and Hegenberger Pl - Drwy [Part 1 LTs]

**Average Delay (sec/veh):** 0.5  **Worst Case Level Of Service:** B [13.8]

**Street Name:** Hegenberger Road  **Access Drwy - Hegenberger Place**
**Approach:** North Bound  South Bound  East Bound  West Bound
**Movement:** L - T - R  L - T - R  L - T - R  L - T - R
**Rights:** Include  Include  Stop Sign  Stop Sign
**Lanes:** 0 0 2 1 0 1 0 2 1 0 1 0 0 0 0 0 0 1! 0 0

---|---|---|---|---|
Control: Uncontrolled  Uncontrolled  Stop Sign  Stop Sign

---|---|---|---|---|
Volume Module: >> Count Date: 15 Oct 2014 << 8:00-9:00 AM
**Base Vol:** 0 954 14 18 0 0 13 0 0 3 0 11
**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 Bas:** 0 954 14 18 0 0 13 0 0 3 0 11
**User Adj:** 0.96 0.96 0.96 0.96 0.96 0.96 0.96 0.96 0.96 0.96 0.96 0.96
**PHF Volume:** 0 994 15 19 0 0 14 0 0 3 0 11
**Reduct Vol:** 0 0 0 0 0 0 0 0 0 0 0 0
**Final Volume:** 0 994 15 19 0 0 14 0 0 3 0 11

---|---|---|---|---|
**Critical Gap** Module:
**Follow Up Time:** 4.1 4.1 7.5 7.5 6.5 6.9

---|---|---|---|---|
**Capacity Module:**
**Conflict Vol:** 1008 369 1039 339
**Potent Cap.:** 695 568 188 233 663
**Move Cap.:** 695 546 184 226 663
**Volume/Cap:** 0.03 0.02 0.02 0.00 0.02

---|---|---|---|---|
**Level Of Service** Module:
**2Way95thQ:** 0.1 0.1 11.8 0.1 0.1 11.8 13.8
**Control Del:** 10.3 11.8 13.8
**LOS by Move:** * * * * B * * B
**Movement:** LT - LTR - RT  LT - LTR - RT  LT - LTR - RT  LT - LTR - RT
**Shared Cap.:** 425
**Shared Queue:** 0.1
**Shrd ConDel:** 13.8
**Approach Del:** 11.8 13.8
**Approach LOS:** * * B B

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

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

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

**Intersection #5 Hegenberger Rd and Hegenberger Pl - Drwy [Part 1 LTs]**

---

**Average Delay (sec/veh):** 0.7  
**Worst Case Level Of Service:** B [13.8]

**Street Name:** Hegenberger Road  
**Access Drvwy:** Hegenberger Place

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

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

**Control:**  
- Uncontrolled  
- Stop Sign

**Rights:**  
- Include  
- Include  
- Include  
- Include

**Lanes:**  
- 0  1  2  0  1  0  2  1  0  1  0  0  0  0  1! 0  0

---

**Volume Module:**  
- Count Date: 15 Oct 2014 << 8:00-9:00 AM

**Base Vol:**  
- 0  954  14  18  0  0  13  0  0  0  3  0  11

**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:**  
- 0  954  14  18  0  0  13  0  0  0  3  0  11

**Added Vol:**  
- 0  7  0  0  0  30  14  0  0  0  0  0  0

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

**Initial Fut:**  
- 0  961  14  18  0  30  27  0  0  3  0  11

**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:**  
- 0.96  0.96  0.96  0.96  0.96  0.96  0.96  0.96  0.96  0.96  0.96  0.96

**PHF Volume:**  
- 0  1001  15  19  0  31  28  0  0  3  0  11

**Reduct Vol:**  
- 0  0  0  0  0  0  0  0  0  0  0  0  0

**Final Volume:**  
- 0  1001  15  19  0  31  28  0  0  3  0  11

---

**Critical Gap Module:**  
- Critical Gp: 4.1  7.5  7.5  6.5  6.9

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

---

**Capacity Module:**  
- Cnflct Vol: 1016  387  1046  1077  341

**Potent Cap.:**  
- 691  551  185  221  661

**Move Cap.:**  
- 691  530  182  215  661

**Volume/Cap:**  
- 0.03  0.05  0.02  0.00  0.02

---

**Level Of Service Module:**  
- 2Way95thQ: 0.1  0.2

**Control Del:**  
- 10.4  12.2

**Movement:**  
- LT - LTR - RT  LT - LTR - RT  LT - LTR - RT  LT - LTR - RT

**Shared Cap.:**  
- 422

**SharedQueue:**  
- 0.1

**Shrd ConDel:**  
- 13.8

**Shared LOS:**  
- B

**Approach Del:**  
- 12.2  13.8

**Approach LOS:**  
- B

---

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

---

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**Existing AM**                Thu Oct 30, 2014 13:22:42                 Page 5-1

195 Hegenberger Hotel
Intersection Level of Service (LOS) Analysis

Level Of Service Computation Report
2000 HCM Unsignalized Method (Base Volume Alternative)

--------------------------------------------------------------------------------
Intersection #6 Pardee Dr and Driveways
--------------------------------------------------------------------------------

Average Delay (sec/veh):      0.7       Worst Case Level Of Service: B[ 14.1]

Street Name:            Driveways                        Pardee Drive
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       Uncontrolled     Uncontrolled
Rights:           Include          Include          Include          Include
Lanes:        0  0  0  0  0    0  0  1! 0  0    0  1  0  1  0    0  1  0  1  0
------------|---------------||---------------||---------------||---------------|

Volume Module: >> Count Date: 15 Oct 2014 << 8:00-9:00 AM
Base Vol:       0    0     0     4    0     1    11  331    10    37  283    19
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:    0    0     0     4    0     1    11  331    10    37  283    19
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:     0.78 0.78  0.78  0.78 0.78  0.78  0.78 0.78  0.78  0.78 0.78  0.78
PHF Volume:     0    0     0     5    0     1    14  424    13    47  363    24
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
FinalVolume:    0    0     0     5    0     1    14  424    13    47  363    24
------------|---------------||---------------||---------------||---------------|

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

Capacity Module:
Conflict Vol: xxxx xxxx xxxxx   710  935   194   387 xxxx xxxxx  437 xxxx xxxxx
Potent Cap.: xxxx xxxx xxxxx   372  267   822  1182 xxxx xxxxx  1133 xxxx xxxxx
Move Cap.: xxxx xxxx xxxxx   357  253   822  1182 xxxx xxxxx  1133 xxxx xxxxx
Volume/Cap: xxxx xxxx xxxxx   0.01 0.00  0.00  0.01 xxxx xxxxx  0.04 xxxx xxxxx
------------|---------------||---------------||---------------||---------------|

Level Of Service Module:
2Way95thQ: xxxx xxxx xxxx xxxx xxxx xxxx xxxx  0.0 xxxx xxxx xxxx  0.1 xxxx xxxx
Control Del:xxxxx xxxx xxxx xxxx xxxx xxxx xxxx  8.1 xxxx xxxx xxxx  8.3 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  402 xxxx xxxx xxxx  xxxx xxxx xxxx
SharedQueue:xxxxx xxxx xxxx xxxx  0.0 xxxx xxxx xxxx  0.1 xxxx xxxx
Shrd ConDel:xxxxx xxxx xxxx xxxx xxxx xxxx xxxx  14.1 xxxx xxxx xxxx  8.3 xxxx xxxx
Shared LOS:    *    *     *    B    A    *    *    A    *    *    *    ApproachDel: xxxxxx  14.1 xxxxxx xxxxxx
ApproachLOS:    *    B    *    *    *    *    *    *    *    *    *

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

------------------------------------------------------------------------------

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195 Hegenberger Hotel
Intersection Level of Service (LOS) Analysis

Level Of Service Computation Report
2000 HCM Unsignalized Method (Future Volume Alternative)

Intersection #6 Pardee Dr and Driveways

Average Delay (sec/veh): 1.0  Worst Case Level Of Service: C[15.8]

Street Name: Driveways  Pardee Drive
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  Uncontrolled  Uncontrolled
Rights: Include  Include  Include  Include
Lanes: 0 0 0 0 0 0 0 1 0 1 0 1 0 1 0 1 0

Volume Module: >> Count Date: 15 Oct 2014 << 8:00-9:00 AM
Base Vol: 0 0 0 4 0 1 11 331 10 37 283 19
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: 0 0 0 4 0 1 11 331 10 37 283 19
Added Vol: 0 0 0 16 0 0 0 0 0 0 0 14
PasserByVol: 0 0 0 0 0 0 0 0 0 0 0 0
Initial Fut: 0 0 0 20 0 1 11 331 10 37 283 33
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: 0.78 0.78 0.78 0.78 0.78 0.78 0.78 0.78 0.78 0.78 0.78 0.78
PHF Volume: 0 0 0 26 0 1 14 424 13 47 363 42
Reduct Vol: 0 0 0 0 0 0 0 0 0 0 0 0
FinalVolume: 0 0 0 26 0 1 14 424 13 47 363 42

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

Capacity Module:
Conflict Vol: 719 944 203 405 437
Potent Cap.: 367 264 811 1165 1133
Move Cap.: 352 249 811 1165 1133
Volume/Cap: 0.07 0.00 0.00 0.01 0.04

Level Of Service Module:
2Way95thQ: 0.0 0.1
Control Del: 8.1 8.3
LOS by Move: LT - LTR - RT LT - LTR - RT LT - LTR - RT LT - LTR - RT
Shared Cap.: 362 362 362 362
SharedQueue: 0.2 0.2 0.2 0.2
Shrd ConDel: 15.8 15.8 15.8 15.8
Shared LOS: C A A*
ApproachDel: 15.8
ApproachLOS: C

Note: Queue reported is the number of cars per lane.
PM Peak-Hour LOS Conditions
Intersection Level of Service (LOS) Analysis

Level Of Service Computation Report
2000 HCM Unsignalized Method (Base Volume Alternative)

Intersection #5 Hegenberger Rd and Hegenberger Pl - Drwy [Part 1 LTs]

Average Delay (sec/veh): 2.0  Worst Case Level Of Service: E[ 49.7]

Street Name: Hegenberger Road  Access Drwvy - Hegenberger Place
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
Rights: Include  Include  Include  Include
Lanes: 0  0  2  1  0  1  0  2  1  0  0  0  1  0  0  1  0  0

Volume Module: >> Count Date: 15 Oct 2014 << 4:15-5:15 PM
Base Vol: 0  0  0  6 1378  19  29  0  22  7  0  29
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 1.00  1.00 1.00
Initial Bse: 0  0  0  6 1378  19  29  0  22  7  0  29
User Adj: 0.94 0.94  0.94 0.94  0.94 0.94  0.94 0.94  0.94 0.94  0.94 0.94  0.94 0.94  0.94 0.94
HPF Volume: 0  0  0  6 1466  20  31  0  23  7  0  31
Reduct Vol: 0  0  0  0  0  0  0  0  0  0  0  0  0  0
Final Volume: 0  0  0  6 1466  20  31  0  23  7  0  31

Critical Gap Module:
Critical Gp:xxxxx xxxx xxxx  4.1 xxxx xxxx  7.5  6.5  6.9  7.5  6.5  6.9
FollowUpTim:xxxxx xxxx xxxx  2.2 xxxx xxxx  3.5  4.0  3.3  3.5  4.0  3.3

Capacity Module:
Cnflict Vol: xxxx xxxx xxxx  0 xxxx xxxx  1489 1489  499 501 1499  0
Potent Cap.: xxxx xxxx xxxx  1636 xxxx xxxx  88 125 523 457 123 1091
Move Cap.: xxxx xxxx xxxx  1636 xxxx xxxx  85 125 523 435 123 1091
Volume/Cap: xxxx xxxx xxxx  0.00 xxxx xxxx  0.36 0.00  0.04 0.02 0.00 0.03

Level Of Service Module:
2Way95thQ: xxxx xxxx xxxx  0.0 xxxx xxxx  xxxx xxxx xxxx xxxx xxxx xxxx
Control Del:xxxxx xxxx xxxx  7.2 xxxx xxxx xxxx xxxx xxxx xxxx xxxx
LOS by Move: * * * * * * 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 133 xxxx xxxx  844 xxxx
SharedQueue:xxxxx xxxx xxxx xxxx xxxx xxxx xxxx xxxx xxxx 1.8 xxxx xxxx  0.1 xxxx
Shrd ConDel:xxxxx xxxx xxxx xxxx xxxx xxxx xxxx xxxx xxxx 49.7 xxxx xxxx  9.5 xxxx
Shared LOS: * * * * * *  E * * * A *
ApproachDel: xxxxxxx xxxxxxx  49.7  9.5
ApproachLOS: * * * E A

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

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195 Hegenberger Hotel  
Intersection Level of Service (LOS) Analysis

Level Of Service Computation Report  
2000 HCM Unsignalized Method (Future Volume Alternative)

Intersection #5 Hegenberger Rd and Hegenberger Pl - Drwy [Part 1 LTs]

Average Delay (sec/veh): 3.4  
Worst Case Level Of Service: F[ 74.9]

Street Name: Hegenberger Road  
Access Drvwy - Hegenberger Place

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

Rights: Include  
Include  
Include  
Include

Lanes: 0 0 2 1 0  
1 0 2 1 0  
0 0 1 0 0  
0 0 1 0 0

Volume Module: >> Count Date: 15 Oct 2014 << 4:15-5:15 PM

Base Vol: 0 0 0 6 1378 19 29 0 22 7 0 29

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 Base: 0 0 0 0 0 0 0 0 0 0 0 0

Added Vol: 0 0 0 0 0 14 0 0 0 0 0 0

Initial Fut: 0 0 0 6 1378 49 43 0 22 7 0 29

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: 0.94 0.94 0.94 0.94 0.94 0.94 0.94 0.94 0.94 0.94 0.94 0.94

PHF Volume: 0 0 0 6 1466 52 46 0 23 7 0 31

Reduced Vol: 0 0 0 0 0 0 0 0 0 0 0 0

Final Volume: 0 0 0 6 1466 52 46 0 23 7 0 31

Critical Gap Module:

Critical Gp: 4.1 6.5 6.9 7.5 6.5 6.9

Follow Up Time: 2.2 3.5 4.0 3.3 3.5 4.0 3.3

Capacity Module:

Conflict Vol: 0.00 0.00 0.00 1505 1505 515 501 1531 0

Potent Cap.: 1636 1636 1636 1636 1636 1636 1636 1636 1636 1636 1636 1636

Move Cap.: 83 122 510 435 118 1091

Volume/Cap.: 0.00 0.00 0.00 0.55 0.00 0.05 0.02 0.00 0.03

Level Of Service Module:

2Way95thQ: 0.00 0.00 0.00 1505 1505 515 501 1531 0

Control Del: 7.2 7.2 7.2 7.2 7.2 7.2 7.2 7.2 7.2 7.2 7.2 7.2


Shared Cap.: 115 115 115 115 115 115 115 115 115 115 115 115

Shared Queue: 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0

Shared LOS: 0 0 0 0 0 0 0 0 0 0 0 0

Approach Del: 74.9 74.9 74.9 74.9 74.9 74.9 74.9 74.9 74.9 74.9 74.9 74.9

Approach LOS: 0 0 0 0 0 0 0 0 0 0 0 0

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

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**195 Hegenberger Hotel**

**Intersection Level of Service (LOS) Analysis**

---

**Level Of Service Computation Report**

*2000 HCM Unsignalized Method (Base Volume Alternative)*

**Intersection #5 Hegenberger Rd and Hegenberger Pl - Drwy [Part 2 LTs]**

---

Average Delay (sec/veh): 0.9
Worst Case Level Of Service: C [17.0]

---

**Street Name:**

Hegenberger Road
Access Drwy - Hegenberger Place

**Approach:**

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

**Movement:**

- L - T - R
- L - T - R
- L - T - R
- L - T - R

**Control:**

- Uncontrolled
- Stop Sign

**Rights:**

- Include

**Lanes:**

- 0 0 2 1 0
- 1 0 2 1 0
- 0 0 1 0 0
- 0 0 1 0 0

**Volume Module:**

- Base Vol: 1190 9 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: 0 1190 9 0 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: 0.94 0.94 0.94 0.94 0.94 0.94 0.94 0.94 0.94 0.94 0.94
- PHF Volume: 1266 10 0 0 0
- Reduct Vol: 0 0 0 0 0
- Final Volume: 1266 10 0 0 0

**Critical Gap Module:**

- Critical Gp: 7.5 6.5 6.9 7.5 6.5 6.9
- FollowUpTim: 3.5 4.0 3.3 3.5 4.0 3.3

**Capacity Module:**

- Cnflict Vol: 422 1276 0
- Potent Cap.: 521 168 1091 127 169 582
- Move Cap.: 493 168 1091 124 169 582
- Volume/Cap: 0.06 0.00 0.02 0.06 0.00 0.05

**Level Of Service Module:**

- 2Way95thQ: 11.1 17.0
- Control Del: 11.1 17.0
- LOS by Move: A C
- Movement: LT - LTR - RT
- Shared Cap.: 646 339
- SharedQueue: 0.3 0.4
- Shrd ConDel: 11.1 17.0
- Shared LOS: * B C
- ApproachDel: 11.1 17.0
- ApproachLOS: B C

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

---

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## Level Of Service Computation Report

### Intersection #5 Hegenberger Rd and Hegenberger Pl - Drwy [Part 2 LTs]

### Average Delay (sec/veh): 1.0

### Worst Case Level Of Service: C [17.0]

### Street Name:
- Hegenberger Road
- Access Drwv - Hegenberger Place

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

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

### Volume Module:
- Count Date: 15 Oct 2014 << 4:15-5:15 PM
- Base Vol: 0 1190 9 0 0 0 29 0 22 7 0 29
- 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: 0 1190 9 0 0 0 29 0 22 7 0 29

### Added Vol: 0 0 0 0 0 30 14 0 0 0 0 0

### Initial Fut: 0 1190 9 0 0 30 43 0 22 7 0 29

### 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: 0.94 0.94 0.94 0.94 0.94 0.94 0.94 0.94 0.94 0.94 0.94 0.94

### PHF Volume: 0 1266 10 0 0 32 46 0 23 7 0 31

### Reduct Vol: 0 0 0 0 0 0 0 0 0 0 0 0

### Final Volume: 0 1266 10 0 0 32 46 0 23 7 0 31

### Critical Gap Module:
- Critical Gp: 7.5 6.5 6.9 7.5 6.5 6.9
- FollowUpTim: 3.5 4.0 3.3 3.5 4.0 3.3

### Capacity Module:
- Cnflict Vol: 438 1291 16 1271 1303 427
- Potent Cap.: 507 165 1066 127 162 582
- Move Cap.: 480 165 1066 124 162 582

### Volume/Cap: 0.10 0.00 0.02 0.06 0.00 0.05

### Level Of Service Module:
- 2Way95thQ: *
- Control Del: *

### Movement:
- LT - LTR - RT
- LT - LTR - RT
- LT - LTR - RT
- LT - LTR - RT

### Shared Cap.: 590 339

### Shrd ConDel: 11.9 17.0

### Shared LOS: B * C

### Approach Del: 11.9 17.0

### Approach LOS: B C

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

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### Level Of Service Computation Report

#### 2000 HCM Unsignalized Method (Base Volume Alternative)

**Intersection #6 Pardee Dr and Driveways**

**Average Delay (sec/veh):** 1.6  **Worst Case Level Of Service:** C [16.7]

**Street Name:**

- Driveways
- Pardee Drive

**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
- Uncontrolled
- Uncontrolled

**Rights:**

- Include
- Include
- Include
- Include

**Lanes:**

- 0 0 0 0 0
- 0 0 0 0 1
- 0 0 0 1 0
- 0 0 1 0 0
- 0 1 0 1 0
- 0 1 0 1 0

**Volume Module:**

- Count Date: 15 Oct 2014 << 4:15 - 5:15 PM
- Base Vol: 0 0 0 37 0 3 2 364 22 87 388 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: 0 0 0 37 0 3 2 364 22 87 388 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: 0 0 0 37 0 3 2 364 22 87 388 1
- Reduct Vol: 0 0 0 0 0 0 0 0 0 0 0 0
- Final Volume: 0 0 0 37 0 3 2 364 22 87 388 1

**Critical Gap Module:**

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

**Capacity Module:**

- Cnflict Vol: 749 953 195 389 386
- Potent Cap.: 352 261 820 1181
- Move Cap.: 333 241 820 1181
- Volume/Cap: 0.11 0.00 0.00 0.07

**Level Of Service Module:**

- 2Way95thQ: 0.0 0.2
- Control Del: 8.1 8.3
- LOS by Move: A
- Movement: LT - LTR - RT
- Shared Cap.: 346
- SharedQueue: 0.4
- Shrd ConDel: 8.1
- Shared LOS: A

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

---

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### 195 Hegenberger Hotel
#### Intersection Level of Service (LOS) Analysis

**Level Of Service Computation Report**

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

**Intersection #6 Pardee Dr and Driveways**

**Average Delay (sec/veh):** 2.0  
**Worst Case Level Of Service:** C[18.1]

**Street Name:** Driveways  
**Pardee Drive**

<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>

**Control:** Stop Sign  
**Rights:** Include  
**Lanes:** 0 0 0 0 0 0 0 0 0 0 1 0 1 0 0 1 0 1 0

**Volume Module:**

<table>
<thead>
<tr>
<th>Count Date:</th>
<th>15 Oct 2014</th>
<th>&lt;&lt;4:15 - 5:15 PM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Base Vol:</td>
<td>0 0 0 0 37 0 2364 22 87 388</td>
<td>1</td>
</tr>
<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 1.00 1.00 1.00</td>
<td></td>
</tr>
<tr>
<td>Initial Bse:</td>
<td>0 0 0 37 0 3 2364 22 87 388</td>
<td>1</td>
</tr>
<tr>
<td>Added Vol:</td>
<td>0 0 0 22 0 0 0 0 0 0 0 0</td>
<td>13</td>
</tr>
<tr>
<td>PasserByVol:</td>
<td>0 0 0 0 0 0 0 0 0 0 0 0</td>
<td>0</td>
</tr>
<tr>
<td>Initial Fut:</td>
<td>0 0 0 59 0 3 2364 22 87 388</td>
<td>14</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 1.00 1.00 1.00</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 1.00 1.00 1.00 1.00 1.00</td>
<td></td>
</tr>
<tr>
<td>PHF Volume:</td>
<td>0 0 0 59 0 3 2364 22 87 388</td>
<td>14</td>
</tr>
<tr>
<td>Reduct Vol:</td>
<td>0 0 0 0 0 0 0 0 0 0 0 0</td>
<td>0</td>
</tr>
<tr>
<td>FinalVolume:</td>
<td>0 0 0 59 0 3 2364 22 87 388</td>
<td>14</td>
</tr>
</tbody>
</table>

**Critical Gap Module:**

| Critical Gp: | 6.8 6.5 6.9 4.1 4.1 | 4.1 4.1 |
| FollowUpTim: | 3.5 4.0 3.3 2.2 | 2.2 2.2 |

**Capacity Module:**

| Conflict Vol: | 755 959 201 402 | 386 386 |
| Potent Cap.: | 349 259 813 1168 | 1184 1184 |
| Move Cap.: | 328 238 813 1168 | 1184 1184 |
| Volume/Cap: | 0.18 0.00 0.00 0.00 | 0.07 0.07 |

**Level Of Service Module:**

| 2Way95thQ: | | | | |
| Control Del: | | | | |
| LOS by Move: | | | | |
| Movement: | LT - LTR - RT | LT - LTR - RT | LT - LTR - RT | LT - LTR - RT |
| Shared Cap.: | 337 337 337 | 337 337 337 |
| SharedQueue: | 0.7 0.7 0.7 | 0.7 0.7 0.7 |
| Shrd ConDel1: | 18.1 18.1 18.1 | 18.1 18.1 18.1 |
| Shared LOS: | * * * * | * * * A * A * |
| Approach Del: | 18.1 | 18.1 | |
| Approach LOS: | * C | * |

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

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Attachment 3
Traffic Signal Warrant Evaluation
### TRAFFIC SIGNAL WARRANTS (Posted Speed of 35 MPH)

#### Major Street: Hegenberger Road
- **Approach Lanes**: 3
- **Critical Approach Speed**: 35.00 mph

#### Minor Street: Site Access Driveway
- **Approach Lanes**: 1
- **Critical Approach Speed**: 15.00 mph

#### Check one (X):
- Rural
- Urban [X]

When 85% > 40 mph is Rural

---

#### Warrant 3 - Peak Hour (PM Peak Hour)
Figure 4C-3

#### Part A
- Total delay for traffic on minor street (vehicle-hours): 5.8
- Volume on minor street approach: 65
- Total entering volume during peak hour: 2,747
- Satisfies Warrant: N (Minor Street Volume < 100 for one-lane approach)

#### Part B
- Peak Hour Volume
  - Major Street Volume (both approaches): 2,646
  - Minor Street Volume (highest approach): 65
- Satisfies Warrant: N (Minor Street Volume < 100 for one-lane approach)

---

#### Warrant 3 - Peak Hour (AM Peak Hour)
Figure 4C-3

#### Part A
- Total delay for traffic on minor street (vehicle-hours): 0.8
- Volume on minor street approach: 23
- Total entering volume during peak hour: 2,258
- Satisfies Warrant: N (Minor Street Volume < 100 for one-lane approach)

#### Part B
- Peak Hour Volume
  - Major Street Volume (both approaches): 2,221
  - Minor Street Volume (highest approach): 23
- Satisfies Warrant: N (Minor Street Volume < 100 for one-lane approach)
195 Hegenberger Hotel
Intersection Level of Service (LOS) Analysis

Peak Hour Delay Signal Warrant Report

Intersection #5 Hegenberger Rd and Hegenberger Pl - Drwy

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 2 1 0</td>
<td>1 0 2 1 0</td>
<td>0 0 1! 0 0</td>
<td>0 0 1! 0 0</td>
</tr>
<tr>
<td>Initial Vol</td>
<td>0 1204</td>
<td>9 1378</td>
<td>49 43</td>
<td>0 22</td>
</tr>
<tr>
<td>ApproachDel</td>
<td>xxxxxx</td>
<td>xxxxxx</td>
<td>322.0</td>
<td>29.0</td>
</tr>
</tbody>
</table>

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

Signal Warrant Rule #1: [vehicle-hours=5.8]
SUCCEED - Vehicle-hours greater than or equal to 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=4][total volume=2747]
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=0.3]
FAIL - Vehicle-hours less than 4 for one lane approach.

Signal Warrant Rule #2: [approach volume=36]
FAIL - Approach volume less than 100 for one lane approach.

Signal Warrant Rule #3: [approach count=4][total volume=2747]
SUCCEED - Total volume greater than or equal to 800 for intersection with four or more 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.
**195 Hegenberger Hotel**  
**Intersection Level of Service (LOS) Analysis**

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

Intersection #5 Hegenberger Rd and Hegenberger Pl - Drwy

---

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  2  1  0</td>
<td>1  0  2  1  0</td>
<td>0  0  1  0  0</td>
<td>0  0  1  0  0</td>
</tr>
</tbody>
</table>

---

Major Street Volume: 2646

Minor Approach Volume: 65

Minor Approach Volume Threshold: -50 [less than minimum of 100]

---

**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 Hegenberger Rd and Hegenberger Pl - Drwy

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 2 1 0</td>
<td>0 1 0 2 1 0</td>
<td>1 0 0 0 0 0</td>
<td>0 0 1 0 0 0</td>
</tr>
<tr>
<td>Initial Vol:</td>
<td>964 14</td>
<td>1182 43 23 0 0 3 0 11</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ApproachDel:</td>
<td>xxxxxx</td>
<td>xxxxxx</td>
<td>86.8</td>
<td>18.5</td>
</tr>
</tbody>
</table>

Signal Warrant Rule #1: [vehicle-hours=0.6]
FAIL - Vehicle-hours less than 4 for one lane approach.

Signal Warrant Rule #2: [approach volume=23]
FAIL - Approach volume less than 100 for one lane approach.

Signal Warrant Rule #3: [approach count=4][total volume=2258]
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=0.1]
FAIL - Vehicle-hours less than 4 for one lane approach.

Signal Warrant Rule #2: [approach volume=14]
FAIL - Approach volume less than 100 for one lane approach.

Signal Warrant Rule #3: [approach count=4][total volume=2258]
SUCCEED - Total volume greater than or equal to 800 for intersection with four or more 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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195 Hegenberger Hotel
Intersection Level of Service (LOS) Analysis

Peak Hour Volume Signal Warrant Report [Urban]

Intersection #5 Hegenberger Rd and Hegenberger Pl - Drwy

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 2 1 0 1 0 2 1 0 1 0 0 0 0 0 0 1 0 0
Initial Vol: 0 964 14 18 1182 43 23 0 0 3 0 1 11

Major Street Volume: 2221
Minor Approach Volume: 23
Minor Approach Volume Threshold: 10 [less than minimum of 100]

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.
Figure 4C-3. Warrant 3, Peak Hour

*Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

Figure 4C-4. Warrant 3, Peak Hour (70% Factor)

*Note: 100 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold volume for a minor-street approach with one lane.