**DKS** *Associates*
TRANSPORTATION SOLUTIONS


# MEMORANDUM

**TO:** Aleta Froman-Goodrich, P.E., City of Oregon City
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**FROM:** Peter Coffey, P.E., P.T.O.E.
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Brad Coy, E.I.T.

**DATE:** August 24, 2010

**SUBJECT:** **Supplemental Warner Milne Road Restriping Analysis** P09155-001-000

This memorandum documents supplemental traffic analysis performed for the section of Warner Milne Road in Oregon City between Linn Avenue and Beavercreek Road to determine whether the existing cross section should include either bike lanes or a center two-way left-turn lane (TWLTL). A similar study was previously performed for the section of Warner Milne Road immediately to the east (i.e., between Beavercreek Avenue and Molalla Avenue), which is currently being repaved and restriped. These two roadway segments are shown in Figure 1. The previous memorandum included an in-depth discussion of background information and safety research findings relating to TWLTLs and bike lanes. This memorandum is references the previous discussion; therefore, it is considered supplemental to the previous memorandum.

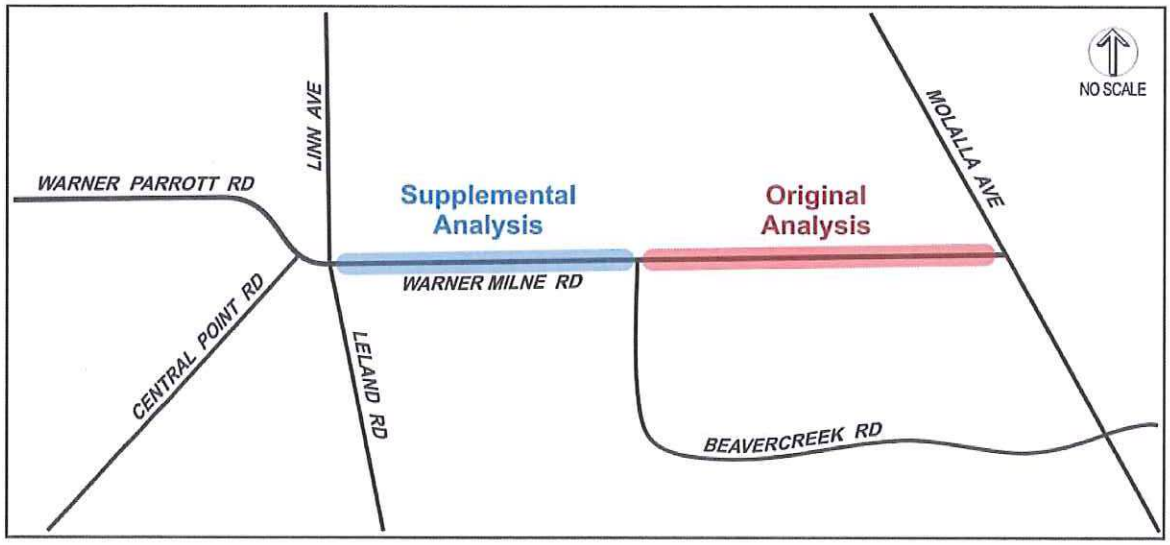


**Figure 1: Warner Milne Road Segments Analyzed in Original and Supplemental Analyses**

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The sections of this supplemental memorandum address the background information particular to this section of Warner Milne Road, a review of key policies and research findings reported in the previous memorandum, existing traffic volumes at the driveways, intersection operations, left-turn lane warrants, and collision history. Following the analysis, a summary of findings is provided.

## Background Information

Warner Milne Road runs between Linn Avenue and Molalla Avenue in Oregon City (through a mixed use commercial/high density residential area[1]), is classified as a minor arterial, and has a speed limit of 30 miles per hour (mph). The section of Warner Milne Road between Beavercreek Road and Linn Avenue (which is the north leg of the intersection, with Leland Road as the south leg) currently includes a travel lane in either direction plus a center TWLTL (except at the Linn Avenue and Beavercreek Road intersections, when the TWLTL transitions into left-turn bays that are serviced by the traffic signals). There are also existing bike lanes that start approximately 275 feet east of the Warner Milne Road/Linn Avenue intersection and extend to the west on Warner Milne Road as it turns into Warner Parrot Road.

As documented in the prior memorandum, the Oregon City Transportation System Plan (TSP) identifies a high priority bicycle system improvement (Project B-6) on the section of Warner Milne Road between Linn Avenue and Molalla Avenue that includes the striping of 5- to 6-foot wide bike lanes in both directions.[2] On the west, these bike lanes would connect to existing bike lanes. On the east, the bike lanes would connect to the bike lanes planned on the realigned section of Warner Milne Road just west of Molalla Avenue in conjunction with the current reconstruction project.

The purpose of the previous memorandum was to address how to restripe the section of Warner Milne Road between Beavercreek Road and Molalla Avenue in conjunction with the current repaving and restriping project. There is no current improvement project for the section of Warner Milne Road between Linn Avenue and Beavercreek, but this memorandum considers the same decision regarding whether to restripe the roadway to provide bike lanes instead of a TWLTL. Because the curb-to-curb distance on Warner Milne Road is not sufficiently wide to include both bike lanes and a TWLTL, a decision must be made regarding whether to leave the existing TWLTL or to remove it and restripe to provide bike lanes.

If it is determined that bike lanes are to be provided on both sections of Warner Milne Road (i.e., between Linn Avenue and Beavercreek Road as well as between Beavercreek Road and Molalla Avenue), then there would still be a gap in the bike lanes at the Warner Milne Road/Beavercreek Road intersection due to the intersection's westbound left-turn lane (which is important for the intersection's traffic signal operations). Bike lanes could only fill this gap by widening the roadway.

[1] Adjacent zoning includes Mixed Use Corridor 1 (MUC-1), Mixed Use Employment (MUE), General Commercial (C), and Multi-Family Dwelling (R-2).
[2] *Oregon City Transportation System Plan*, Ordinance No. 01-1009, Adopted April 2001, Table 5-11, page 5-51; Project B-6 has an estimated cost of $10,150.

## Review of Key Policies and Research Findings

The previous memorandum discussed key policies and research findings related to TWLTLs and bike lanes in Oregon City. Below are some of the main findings:

### Key Policies

- The Oregon City TSP indicates that bike lanes are required on minor arterials while center turn lanes are optional.[3] Therefore, because Warner Milne Road is classified as a minor arterial, bike lanes would typically be a higher priority than a TWLTL.
- Almost all other minor arterials throughout the city have bike lanes instead of a TWLTL.
- Bike lanes along this section of Warner Milne Road are expected to encourage residents to use alternative transportation modes and contribute to a reduction in vehicle-miles traveled (VMT), which will help the City make progress to TSP goal to reduce per capita VMT.
- Providing bike lanes is a proactive and economical approach to reducing greenhouse gas (GHG) emissions, which will help Oregon City to meet its TSP Goal to "ensure the multi-modal transportation system preserves, protects, and supports the environmental integrity of the Oregon City community."[4]
- Providing bike lanes will help Oregon City make progress towards meeting multiple regional goals identified by Metro in their *2035 Regional Transportation Plan*.[5]

### Bike Lane Research Findings

- Cyclists are important roadway users, and all roadways should be designed under the assumption that they will be used by cyclists.
- Community goals (such as those identified in the Oregon City TSP) are important in shaping how a bicycle network is developed.
- Bicyclist safety is can be improved by providing bike lanes, and special efforts should be made to assure a high quality bike lane network.
- Two of the main considerations for determining when a striped bike lane should be provided are when there are more than 3,000 daily vehicles and/or vehicular travel speeds are in excess of 25 mph.

### Center Two-Way Left-Turn Lane (TWLTL) Research Findings

- It is best to remove left-turning traffic from through lanes whenever practical, though the degree of importance of providing a turn lane is based on whether one is warranted. The two main warrant considerations are high traffic volumes and identified safety concerns.[6]

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[3] *Oregon City Transportation System Plan (TSP)*, Ordinance No. 01-1009, Adopted April 2001, Figure 5-2A (Street Design Standards: Typical Sections).
[4] I.B.I.D., Goal 1: Objective 9, pg. 5-4.
[5] *2035 Regional Transportation Plan: Public Review Draft*, Metro, September 15, 2009; pgs.9 to 11
[6] *A Policy on Geometric Design of Highways and Streets (Fifth Edition, 2004)*, AASHTO, pg. 682.

- Some benefits of TWLTL are less collisions (especially rear-ends, though the greatest benefits are experienced in rural locations), reduced corridor travel times, higher roadway capacity, and preference of both drivers and owners of abutting properties.
- Not all roadways are good candidates for striping TWLTLs. The typical preferred use is for an arterial road with closely spaced, low-volume commercial driveways (i.e., no heavy concentrations of left-turning traffic), relatively low travel speeds are (25 to 45 mph), and total roadway volumes below 24,000 daily vehicles.

## Traffic Volumes

Because they are the basis of operational and warrant analysis, traffic volumes were collected during the a.m. (7:00 to 9:00 a.m.) and p.m. (4:00 to 6:00 p.m.) peak periods at the following key driveways along Warner Milne Road between Linn Avenue and Beavercreek Road:

- Warner Milne Road/PGE (East) and Red Soils (East) Driveways
- Warner Milne Road/PGE (West) and Red Soils (Center) Driveways
- Warner Milne Road/Red Soils (West) Driveways
- Warner Milne Road/Hilltop Court Driveway

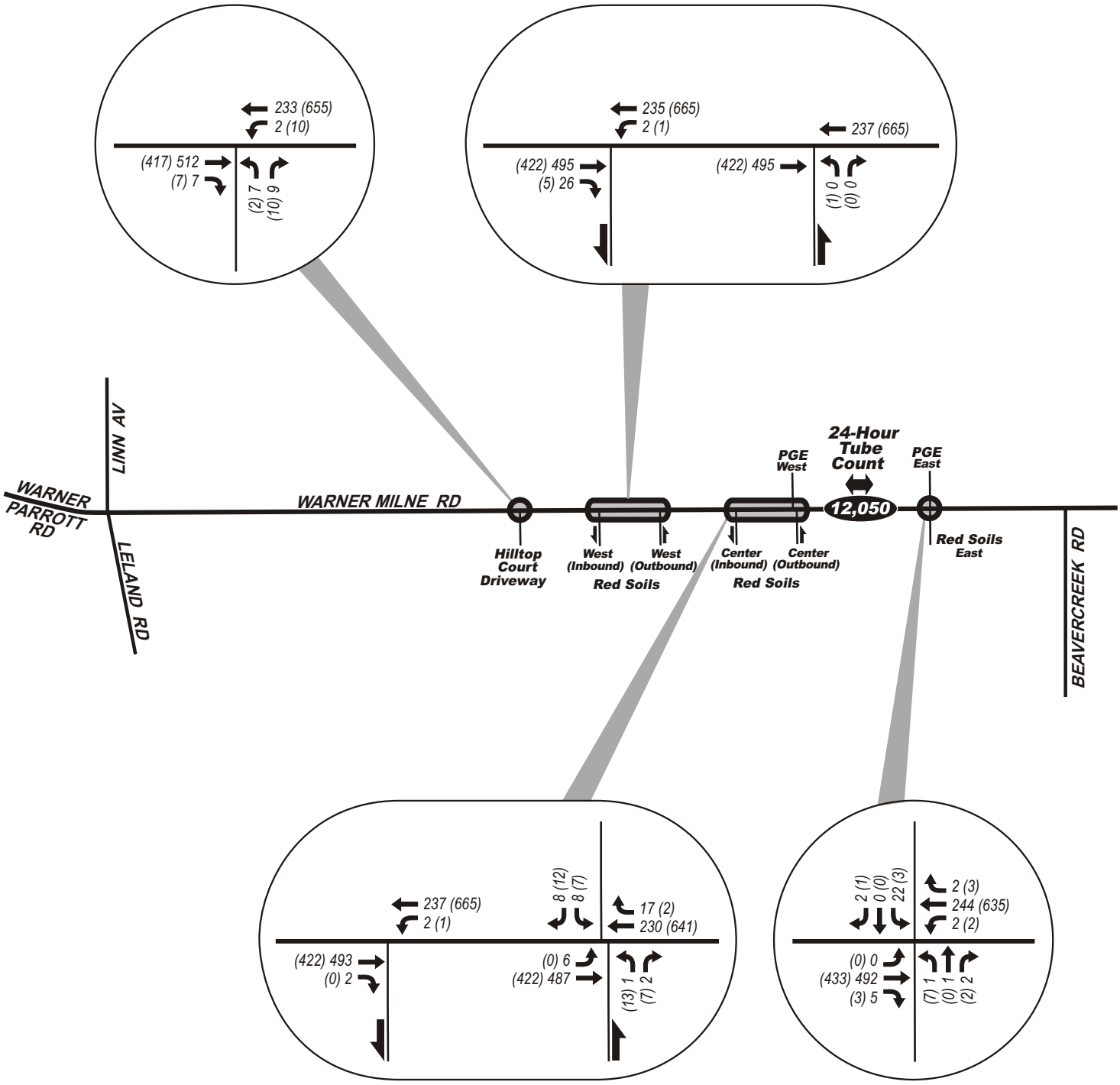
The resulting intersection volumes assumed for this analysis are shown in Figure 2 and detailed count information is provided in the appendix. A review of the left-turn volumes into the driveways shows there are no heavy concentrations of left-turning traffic at any of these driveways. As shown in Figure 2, each of the six inbound driveways had ten or fewer left turns from Warner Milne Road.

A 24-hour tube count on Warner Milne Road between Beavercreek Road and Molalla Avenue was also performed and the measured traffic volumes and speeds are listed in Table 1. This data indicates that bi-directional average daily traffic (ADT) volumes are approximately 12,050 vehicles and the 85$^{th}$ percentile travel speed is approximately 31 mph, which is slightly higher than the 30-mph speed limit. Therefore, Warner Milne Road is a lower speed, lower volume roadway and would be a good candidate for a TWLTL. However, because volumes are greater than 3,000 daily vehicles and travel speeds are greater than 25 mph, it is also important to provide bike lanes on this roadway section.

There were also approximately 185 bikes (including motorcycles) using the vehicle travel lanes during the day (approximately 1.5 percent of total traffic) based on the traffic count data with approximately 20 of these occurring during the p.m. peak hour. Because these were counted with roadway tubes, it does not include any additional bicycles that may have been using the sidewalks.

**Table 1: 24-Hour Warner Milne Tube Data (Weekday, March 2010)**

| Data | By Direction of Travel | | Total |
|---|---|---|---|
| | *Eastbound* | *Westbound* | |
| Approximate Daily Traffic Volume | 6,000 vehicles | 6,050 vehicles | 12,050 vehicles |
| 85$^{th}$ Percentile Speed | 32 mph | 30 mph | 31 mph |
| Approximate Daily Bikes in Vehicular Travel Lane (includes Motorcycles) | 90 bikes | 95 bikes | 185 bikes |




**LEGEND**

- Study Intersection
- AM (PM) - Peak Hour Traffic Volumes

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NO SCALE

**Figure 2**

# EXISTING A.M. AND P.M. PEAK HOUR DRIVEWAY VOLUMES

## Intersection Operations

Intersection traffic operations were analyzed for the four study area driveways both with and without a center two-way left-turn lane (TWLTL) in order to compare the operational difference between the two striping alternatives. The operating conditions were estimated for both the a.m. and p.m. peak hours using the traffic volumes discussed previously (see Figure 2).

The average delay, level of service (LOS), and volume to capacity (V/C) ratios were determined using *2000 Highway Capacity Manual* methodology[7] and are listed in Table 2. As shown, all driveways would operate at LOS D or better and meet the Oregon City LOS E operating standard for unsignalized intersections regardless of whether a center TWLTL is provided.[8] Therefore, the TWLTL is not needed to meet operating standards; however, its removal would increase delay to the vehicles both on Warner Milne Road (due to left turning vehicles waiting in the travel lane) and at the driveways (because the TWLTL is no longer available to turn into and wait in and there is also increased congestion on Warner Milne Road).

**Table 2: Driveway Operating Conditions (A.M. and P.M. Peak Hours)**

| Driveway on Warner Milne Road | Operating Standard | With Center Turn Lane | | | No Center Turn Lane | | |
|---|---|---|---|---|---|---|---|
| | | *Delay* | *LOS* | *V/C* | *Delay* | *LOS* | *V/C* |
| **A.M. Peak Hour** | | | | | | | |
| PGE (East)-Red Soils (East) | LOS E | 12.8 | A/B | 0.35 | 14.1 | A/B | 0.35 |
| PGE (West)-Red Soils (Center) outbound | LOS E | 1.0 | A/A | 0.35 | 1.0 | A/A | 0.35 |
| Red Soils (Center) inbound | LOS E | 1.0 | A/A | 0.33 | 1.0 | A/A | 0.33 |
| Red Soils (West) outbound | LOS E | 1.0 | A/A | 0.33 | 1.0 | A/A | 0.33 |
| Red Soils (West) inbound | LOS E | 12.7 | A/B | 0.33 | 15.0 | A/B | 0.44 |
| Hilltop Court | LOS E | 16.2 | A/C | 0.33 | 21.7 | A/C | 0.44 |
| **P.M. Peak Hour** | | | | | | | |
| PGE (East)-Red Soils (East) | LOS E | 11.9 | A/B | 0.42 | 13.1 | A/B | 0.65 |
| PGE (West)-Red Soils (Center) outbound | LOS E | 1.0 | A/A | 0.43 | 1.0 | A/A | 0.65 |
| Red Soils (Center) inbound | LOS E | 15.5 | A/C | 0.43 | 22.1 | A/C | 0.43 |
| Red Soils (West) outbound | LOS E | 1.0 | A/A | 0.43 | 1.0 | A/A | 0.65 |
| Red Soils (West) inbound | LOS E | 15.7 | A/C | 0.41 | 22.9 | A/C | 0.63 |
| Hilltop Court | LOS E | 18.3 | A/C | 0.41 | 26.9 | A/D | 0.63 |

Delay = Average Stopped Delay per Vehicle (sec) at Worst Movement (typically a minor movement)
LOS = Level of Service of Major Street/Minor Street
V/C = Volume-to-Capacity Ratio of Worst Movement
**Bold Underlined** values do not meet standards.

[7] *2000 Highway Capacity Manual*, Transportation Research Board, Washington DC, 2000.
[8] The TWLTL analysis assumes 2-stage gap acceptance where vehicles are able to pull out of the driveways and wait in the TWLTL before merging with traffic. The analysis assumes that TWLTL storage is available for one vehicle.

## Left-Turn Lane Warrants

Left turn lane warrants were analyzed at the four study area driveways and are a good indicator of where left-turn lanes are needed because they take into account roadway characteristics that have been shown to influence both safety and capacity of left-turn movements (e.g., roadway volumes, speeds, expected traffic flow, and number of travel lanes). Table 3 provides the results of the warrant analysis based on methodologies provided by the Highway Research Board (HRB) and ODOT. As shown, no left-turn lane warrants using either method are met. Therefore, there are no turn lane volume concerns (from a warrants perspective) that indicate a center turn lane is needed.

**Table 3: Turn Lane Warrants (A.M. and P.M. Peak Hours)**

| Driveway on Warner Milne Road | Movement | Turn Lane Warrants Met? | |
|---|---|---|---|
| | | *HRB (A.M./P.M.)*[a] | *ODOT (A.M./P.M.)* |
| PGE (East) | Eastbound | No/No | No/No |
| Red Soils (East) | Westbound | No/No | No/No |
| PGE (West) | Eastbound | No/No | No/No |
| Red Soils (Center) inbound | Westbound | No/No | No/No |
| Red Soils (West) inbound | Westbound | No/No | No/No |
| Hilltop Court | Westbound | No/No | No/No |

[a] HRB = Highway Research Board

## Collision Analysis

Collision analysis was performed for the segment of Warner Milne Road between Linn Avenue (which is the north leg of the intersection, with Leland Road as the south leg) and Beavercreek Road (also referred to as Kaen Avenue). Only those collisions not related to the Warner Milne Road/Beavercreek Road and Warner Milne Road/Molalla Avenue intersections and their associated intersection approaches and turn lanes were considered. Therefore, the specific segment starts 250 feet east of Linn Avenue and ends 100 feet west of Beavercreek Road.

The collision history for this segment of road was obtained for the most recent three years (i.e., 2006 through 2008) from the ODOT Crash Analysis and Reporting Unit. The data indicate that there were no reported collisions on this roadway section during these three years. Therefore, it appears that there are no significant safety concerns under current conditions (i.e., with the existing TWLTL). Because TWLTLs improve safety, it is possible that if the TWLTL is removed, then safety may decrease and there may be an increase in collisions in the future. Therefore, if City Staff decide to stripe bike lanes instead of a TWLTL for this segment of roadway, it is recommended that a before-and-after safety study be performed as data is available in order to verify the safety effects.

## Summary of Findings

The curb-to-curb distance on Warner Milne Road in Oregon City between Linn Avenue and Molalla Avenue is not wide enough to include both bike lanes and a center two-way left-turn lane (TWLTL). Therefore, City staff is considering removing the existing TWLTL between Linn Avenue and Beavercreek Road in order to provide improved bike lane connectivity (a similar consideration is

also being made for the section of Milne Road between Beavercreek Road and Molalla Avenue, but there is a current repaving and restriping project that it would correspond with, so the two sections were considered separately).

Below is a summary list of findings related to removing the existing TWLTL and providing bike lanes for the section of Warner Milne Road between Linn Avenue and Beavercreek Road.

**Why leaving the TWLTL may be helpful**

- This section of Warner Milne Road is a good candidate for a TWLTL because it has the desired characteristics (i.e., minor arterial classification, no heavy concentrations of left-turning traffic, close spacing of driveways, lower travel speeds, and lower traffic volumes).
- There have been no recent identified safety concerns with the current TWLTL.

**Why a TWLTL is not necessary**

- There are no operating concerns that indicate a center turn lane is necessary (i.e., all driveway intersections meet operating standards).
- There are no turn lane volume concerns that indicate a center turn lane is necessary (i.e., no turn lane warrants are met at the driveways).
- Striping a TWLTL prevents the inclusion of bike lanes. This is inconsistent with the Oregon City TSP, which indicates that bike lanes are required on minor arterials while a center turn lane is optional.
- Other minor arterials throughout Oregon City provide bike lanes instead of TWLTLs.

**Why bike lanes are important**

- The Oregon City TSP indicates that bike lanes are required on minor arterials and that TWLTLs are optional. Providing bike lanes instead of a TWLTL is also consistent with Goal #1 (Multi-Modal Travel Options) of the Oregon City TSP. In particular, Objectives 2, 4, and 9 are better met by striping bike lanes.[9] Because the Oregon City TSP reflects community goals, it is an important document to provide guidance for this decision.
- The Oregon City TSP identifies the striping of 5- to 6-foot wide bike lanes in both directions as a high priority bicycle system improvement (Project B-6).
- Safety research indicates that bike lanes should be provided because traffic volumes are greater than 3,000 daily vehicles and travel speeds are greater than 25 mph.

**Potential considerations should a TWLTL not be provided**

- To striping bike lanes, the existing TWLTL would need to be removed, which may affect safety. Therefore, it is recommended that a before-and-after safety study be performed as data is available in order to verify the safety effects.

Let us know if you have any questions or comments.

[9] *Oregon City TSP*, Ordinance No. 01-1009, Adopted April 2001, Goal 1: Objectives 2, 4, & 9, pg. 5-4.

# Appendix

**Traffic Counts – AM Peak Hour**

**Traffic Counts – PM Peak Hour**

**Traffic Counts – 24-Hour Tube Data**

**Level of Service Descriptions**

**HCM Analysis – With Turn Lanes**

**HCM Analysis – Without Turn Lanes**

**Turn Lane Warrants**

# Traffic Counts – AM Peak Hour

Type of peak hour being reported: Intersection Peak

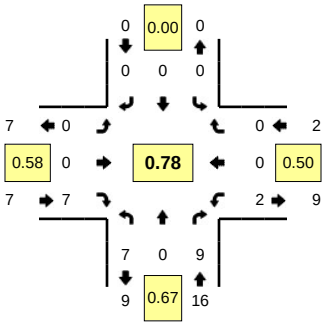
Method for determining peak hour: Total Entering Volume

**LOCATION:** Hilltop Ct -- Warner Milne Rd

**QC JOB #:** 10487707

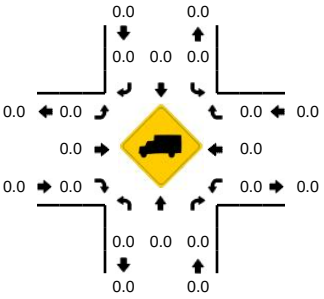
**CITY/STATE:** Oregon City, OR

**DATE:** 3/11/2010

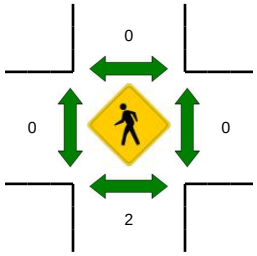


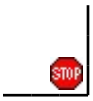

**Peak-Hour: 7:20 AM -- 8:20 AM**

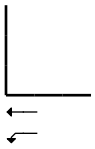
**Peak 15-Min: 7:25 AM -- 7:40 AM**

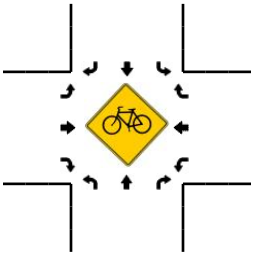


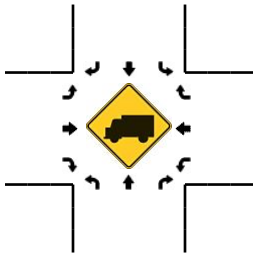


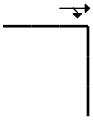


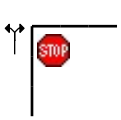



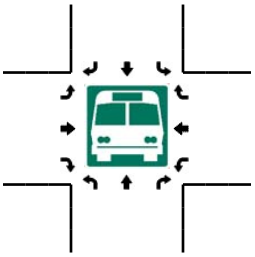











| 5-Min Count Period Beginning At | Hilltop Ct (Northbound) | | | | Hilltop Ct (Southbound) | | | | Warner Milne Rd (Eastbound) | | | | Warner Milne Rd (Westbound) | | | | Total | Hourly Totals |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | U | Left | Thru | Right | U | Left | Thru | Right | U | Left | Thru | Right | U | | |
| 7:00 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | |
| 7:05 AM | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | |
| 7:10 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 7:15 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 7:20 AM | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | |
| 7:25 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 2 | |
| 7:30 AM | 1 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | |
| 7:35 AM | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 3 | |
| 7:40 AM | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | |
| 7:45 AM | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 2 | |
| 7:50 AM | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | |
| 7:55 AM | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 4 | 22 |
| 8:00 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 21 |
| 8:05 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 19 |
| 8:10 AM | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 2 | 21 |
| 8:15 AM | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 4 | 25 |
| 8:20 AM | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 24 |
| 8:25 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 22 |
| 8:30 AM | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 20 |
| 8:35 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 17 |
| 8:40 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 16 |
| 8:45 AM | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 16 |
| 8:50 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 14 |
| 8:55 AM | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 11 |

| Peak 15-Min Flowrates | Northbound | | | | Southbound | | | | Eastbound | | | | Westbound | | | | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | U | Left | Thru | Right | U | Left | Thru | Right | U | Left | Thru | Right | U | |
| All Vehicles | 8 | 0 | 12 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 8 | 0 | 4 | 0 | 0 | 0 | 32 |
| Heavy Trucks | 0 | 0 | 0 | | 0 | 0 | 0 | | 0 | 0 | 0 | | 0 | 0 | 0 | | 0 |
| Pedestrians | | 0 | | | | 0 | | | | 0 | | | | 0 | | | 0 |
| Bicycles | | | | | | | | | | | | | | | | | |
| Railroad | | | | | | | | | | | | | | | | | |
| Stopped Buses | | | | | | | | | | | | | | | | | |

*Comments:*

Report generated on 3/17/2010 9:46 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net)

Type of peak hour being reported: Intersection Peak

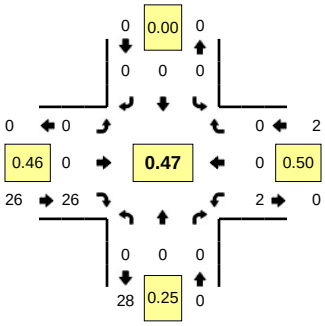
Method for determining peak hour: Total Entering Volume

**LOCATION:** Red Soils (West) -- Warner Milne Rd

**QC JOB #:** 10487705

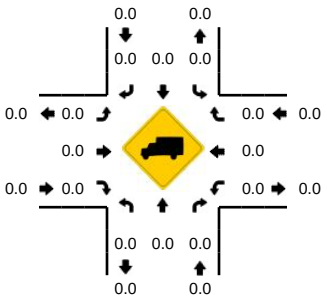
**CITY/STATE:** Oregon City, OR

**DATE:** 3/11/2010

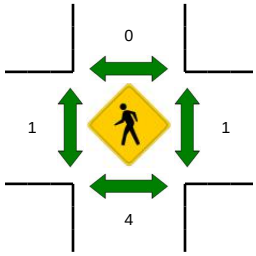


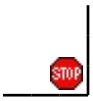

**Peak-Hour: 7:00 AM -- 8:00 AM**

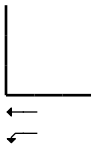
**Peak 15-Min: 7:00 AM -- 7:15 AM**

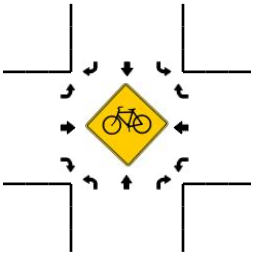


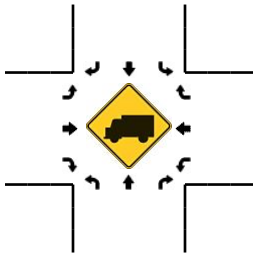

Quality Counts
TRANSPORTATION DATA COLLECTION SERVICES

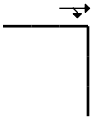


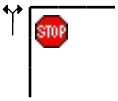



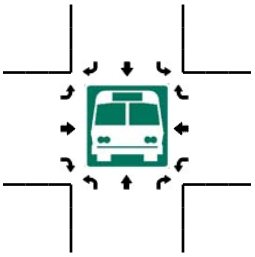











| 5-Min Count Period Beginning At | Red Soils (West) (Northbound) | | | | Red Soils (West) (Southbound) | | | | Warner Milne Rd (Eastbound) | | | | Warner Milne Rd (Westbound) | | | | Total | Hourly Totals |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | U | Left | Thru | Right | U | Left | Thru | Right | U | Left | Thru | Right | U | | |
| 7:00 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 10 | 0 | 1 | 0 | 0 | 0 | 11 | |
| 7:05 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 2 | |
| 7:10 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 2 | |
| 7:15 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 2 | |
| 7:20 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | |
| 7:25 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 7:30 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 1 | 0 | 0 | 0 | 3 | |
| 7:35 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 7:40 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 2 | |
| 7:45 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | |
| 7:50 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 2 | |
| 7:55 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 2 | 28 |
| 8:00 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 2 | 19 |
| 8:05 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 2 | 19 |
| 8:10 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 2 | 19 |
| 8:15 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 18 |
| 8:20 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 3 | 20 |
| 8:25 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 21 |
| 8:30 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 19 |
| 8:35 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 20 |
| 8:40 AM | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 2 | 20 |
| 8:45 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 2 | 21 |
| 8:50 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 19 |
| 8:55 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 3 | 20 |

| Peak 15-Min Flowrates | Northbound | | | | Southbound | | | | Eastbound | | | | Westbound | | | | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | U | Left | Thru | Right | U | Left | Thru | Right | U | Left | Thru | Right | U | |
| All Vehicles | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 56 | 0 | 4 | 0 | 0 | 0 | 60 |
| Heavy Trucks | 0 | 0 | 0 | | 0 | 0 | 0 | | 0 | 0 | 0 | | 0 | 0 | 0 | | 0 |
| Pedestrians | | 8 | | | | 0 | | | | 0 | | | | 0 | | | 8 |
| Bicycles | | | | | | | | | | | | | | | | | |
| Railroad | | | | | | | | | | | | | | | | | |
| Stopped Buses | | | | | | | | | | | | | | | | | |

*Comments:*

Report generated on 3/17/2010 9:46 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net)

Type of peak hour being reported: Intersection Peak

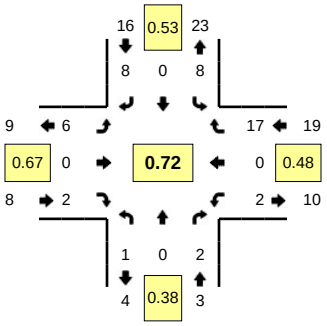
Method for determining peak hour: Total Entering Volume

**LOCATION:** PGE (West)/Red Soils (Center) -- Warner Milne Rd

**QC JOB #:** 10487703

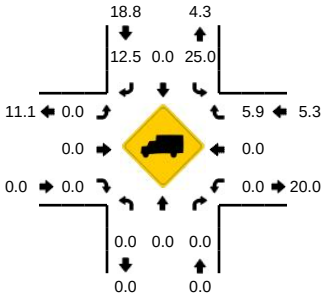
**CITY/STATE:** Oregon City, OR

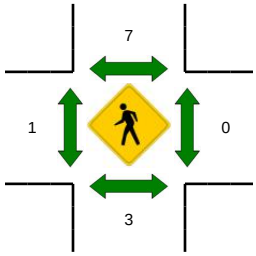
**DATE:** 3/11/2010

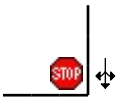


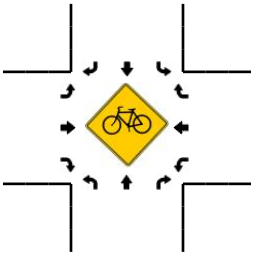

**Peak-Hour: 7:00 AM -- 8:00 AM**

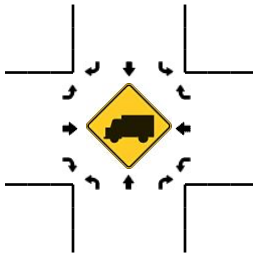
**Peak 15-Min: 7:35 AM -- 7:50 AM**

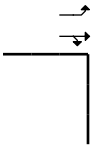


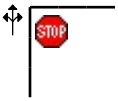



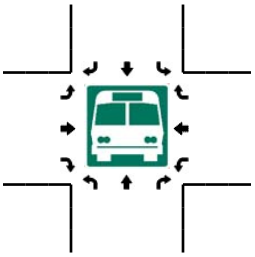









| 5-Min Count Period Beginning At | PGE (West)/Red Soils (Center) (Northbound) | | | | PGE (West)/Red Soils (Center) (Southbound) | | | | Warner Milne Rd (Eastbound) | | | | Warner Milne Rd (Westbound) | | | | Total | Hourly Totals |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | U | Left | Thru | Right | U | Left | Thru | Right | U | Left | Thru | Right | U | | |
| 7:00 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 6 | 0 | 7 | |
| 7:05 AM | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 3 | |
| 7:10 AM | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 4 | |
| 7:15 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 3 | |
| 7:20 AM | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 5 | |
| 7:25 AM | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 3 | |
| 7:30 AM | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | |
| 7:35 AM | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 4 | |
| 7:40 AM | 0 | 0 | 1 | 0 | 2 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 7 | |
| 7:45 AM | 0 | 0 | 0 | 0 | 2 | 0 | 2 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 5 | |
| 7:50 AM | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | |
| 7:55 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 46 |
| 8:00 AM | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 40 |
| 8:05 AM | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 38 |
| 8:10 AM | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 3 | 37 |
| 8:15 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 34 |
| 8:20 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 29 |
| 8:25 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 26 |
| 8:30 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 24 |
| 8:35 AM | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 22 |
| 8:40 AM | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 17 |
| 8:45 AM | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 3 | 15 |
| 8:50 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 13 |
| 8:55 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 2 | 14 |

| Peak 15-Min Flowrates | Northbound | | | | Southbound | | | | Eastbound | | | | Westbound | | | | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | U | Left | Thru | Right | U | Left | Thru | Right | U | Left | Thru | Right | U | |
| All Vehicles | 0 | 0 | 4 | 0 | 16 | 0 | 20 | 0 | 4 | 0 | 8 | 0 | 4 | 0 | 8 | 0 | 64 |
| Heavy Trucks | 0 | 0 | 0 | | 0 | 0 | 0 | | 0 | 0 | 0 | | 0 | 0 | 0 | | 0 |
| Pedestrians | | 4 | | | | 20 | | | | 4 | | | | 0 | | | 28 |
| Bicycles | | | | | | | | | | | | | | | | | |
| Railroad | | | | | | | | | | | | | | | | | |
| Stopped Buses | | | | | | | | | | | | | | | | | |

*Comments:*

Report generated on 3/17/2010 9:46 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net)

Type of peak hour being reported: Intersection Peak

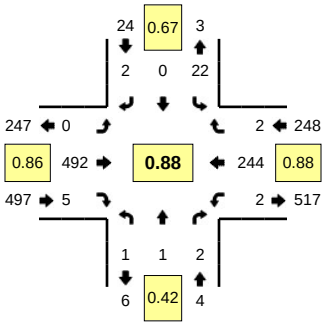
Method for determining peak hour: Total Entering Volume

**LOCATION:** PGE (East)/Red Soils (East) -- Warner Milne Rd

**QC JOB #:** 10487701

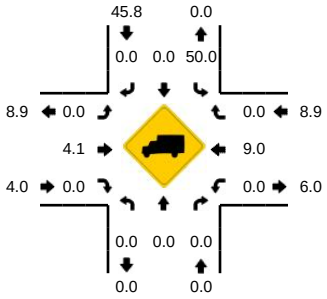
**CITY/STATE:** Oregon City, OR

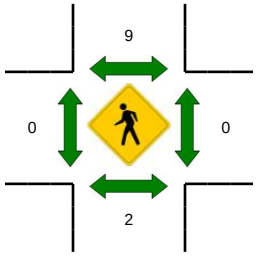
**DATE:** 3/11/2010

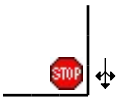


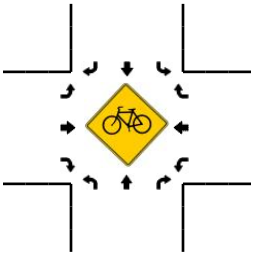

**Peak-Hour: 7:30 AM -- 8:30 AM**

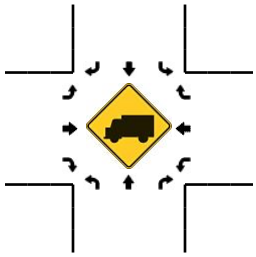
**Peak 15-Min: 7:50 AM -- 8:05 AM**

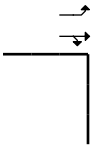


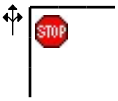



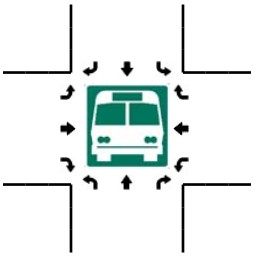









| 5-Min Count Period Beginning At | PGE (East)/Red Soils (East) (Northbound) | | | | PGE (East)/Red Soils (East) (Southbound) | | | | Warner Milne Rd (Eastbound) | | | | Warner Milne Rd (Westbound) | | | | Total | Hourly Totals |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | U | Left | Thru | Right | U | Left | Thru | Right | U | Left | Thru | Right | U | | |
| 7:00 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 32 | 0 | 0 | 0 | 17 | 0 | 0 | 49 | |
| 7:05 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 40 | 0 | 0 | 0 | 13 | 0 | 0 | 53 | |
| 7:10 AM | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 30 | 0 | 0 | 1 | 11 | 0 | 0 | 43 | |
| 7:15 AM | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 19 | 0 | 0 | 0 | 12 | 0 | 0 | 34 | |
| 7:20 AM | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 2 | 35 | 1 | 0 | 0 | 13 | 1 | 0 | 56 | |
| 7:25 AM | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 34 | 1 | 0 | 0 | 21 | 0 | 0 | 60 | |
| 7:30 AM | 0 | 0 | 1 | 0 | 2 | 0 | 0 | 0 | 0 | 36 | 0 | 0 | 0 | 15 | 0 | 0 | 54 | |
| 7:35 AM | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 48 | 1 | 0 | 0 | 21 | 0 | 0 | 73 | |
| 7:40 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 42 | 0 | 0 | 0 | 26 | 0 | 0 | 68 | |
| 7:45 AM | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 40 | 0 | 0 | 0 | 10 | 0 | 0 | 52 | |
| 7:50 AM | 0 | 0 | 0 | 0 | 4 | 0 | 2 | 0 | 0 | 42 | 1 | 0 | 0 | 23 | 0 | 0 | 72 | |
| 7:55 AM | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 56 | 0 | 0 | 1 | 15 | 0 | 0 | 76 | 690 |
| 8:00 AM | 1 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 45 | 0 | 0 | 0 | 23 | 0 | 0 | 71 | 712 |
| 8:05 AM | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 41 | 1 | 0 | 0 | 24 | 1 | 0 | 69 | 728 |
| 8:10 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 31 | 1 | 0 | 0 | 22 | 0 | 1 | 55 | 740 |
| 8:15 AM | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 36 | 1 | 0 | 0 | 18 | 0 | 0 | 57 | 763 |
| 8:20 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 36 | 0 | 0 | 0 | 20 | 0 | 0 | 56 | 763 |
| 8:25 AM | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 39 | 0 | 0 | 0 | 27 | 1 | 0 | 70 | 773 |
| 8:30 AM | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 23 | 1 | 0 | 0 | 15 | 0 | 0 | 41 | 760 |
| 8:35 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 40 | 0 | 0 | 0 | 22 | 0 | 0 | 62 | 749 |
| 8:40 AM | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 37 | 0 | 0 | 0 | 17 | 1 | 0 | 57 | 738 |
| 8:45 AM | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 39 | 0 | 0 | 1 | 12 | 0 | 0 | 53 | 739 |
| 8:50 AM | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 29 | 0 | 0 | 1 | 16 | 0 | 0 | 47 | 714 |
| 8:55 AM | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 29 | 0 | 0 | 0 | 27 | 0 | 0 | 58 | 696 |

| Peak 15-Min Flowrates | Northbound | | | | Southbound | | | | Eastbound | | | | Westbound | | | | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | U | Left | Thru | Right | U | Left | Thru | Right | U | Left | Thru | Right | U | |
| All Vehicles | 4 | 0 | 0 | 0 | 40 | 0 | 8 | 0 | 0 | 572 | 4 | 0 | 4 | 244 | 0 | 0 | 876 |
| Heavy Trucks | 0 | 0 | 0 | | 20 | 0 | 0 | | 0 | 28 | 0 | | 0 | 8 | 0 | | 56 |
| Pedestrians | | 0 | | | | 8 | | | | 0 | | | | 0 | | | 8 |
| Bicycles | | | | | | | | | | | | | | | | | |
| Railroad | | | | | | | | | | | | | | | | | |
| Stopped Buses | | | | | | | | | | | | | | | | | |

*Comments:*

Report generated on 3/17/2010 9:46 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net)

# Traffic Counts – PM Peak Hour

Type of peak hour being reported: Intersection Peak

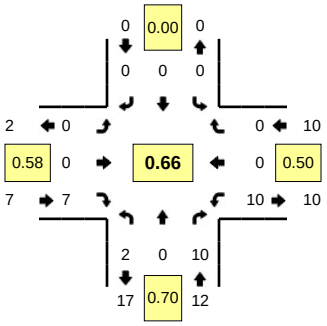
Method for determining peak hour: Total Entering Volume

**LOCATION:** Hilltop Ct -- Warner Milne Rd

**QC JOB #:** 10487708

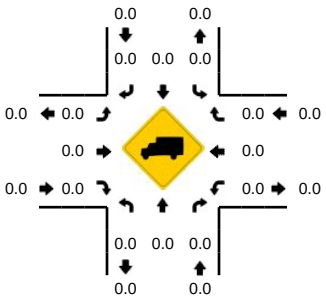
**CITY/STATE:** Oregon City, OR

**DATE:** 3/11/2010

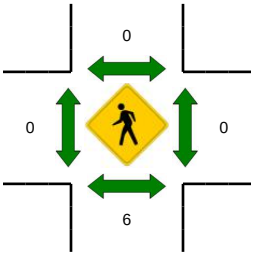


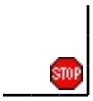

**Peak-Hour: 4:50 PM -- 5:50 PM**

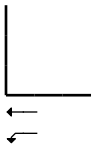
**Peak 15-Min: 5:20 PM -- 5:35 PM**

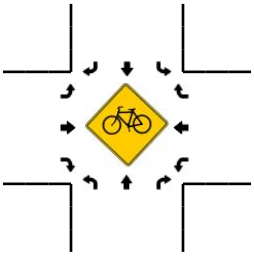


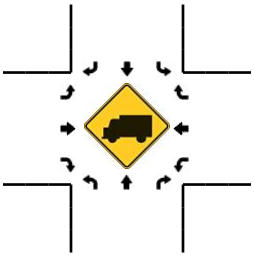

Quality Counts
TRANSPORTATION DATA COLLECTION SERVICES

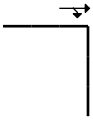


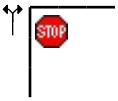



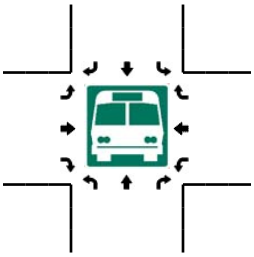











| 5-Min Count Period Beginning At | Hilltop Ct (Northbound) | | | | Hilltop Ct (Southbound) | | | | Warner Milne Rd (Eastbound) | | | | Warner Milne Rd (Westbound) | | | | Total | Hourly Totals |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | U | Left | Thru | Right | U | Left | Thru | Right | U | Left | Thru | Right | U | | |
| 4:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 2 | |
| 4:05 PM | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 2 | 0 | 0 | 0 | 6 | |
| 4:10 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 4:15 PM | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 2 | 0 | 0 | 0 | 4 | |
| 4:20 PM | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | |
| 4:25 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 4:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 4:35 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 4:40 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 4:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 4:50 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 2 | 0 | 0 | 0 | 3 | |
| 4:55 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 16 |
| 5:00 PM | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 15 |
| 5:05 PM | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 3 | 12 |
| 5:10 PM | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 2 | 14 |
| 5:15 PM | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 1 | 0 | 0 | 0 | 4 | 14 |
| 5:20 PM | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 15 |
| 5:25 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 3 | 0 | 0 | 0 | 4 | 19 |
| 5:30 PM | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 5 | 24 |
| 5:35 PM | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 2 | 26 |
| 5:40 PM | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 2 | 28 |
| 5:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 29 |
| 5:50 PM | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 27 |
| 5:55 PM | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 2 | 29 |

| Peak 15-Min Flowrates | Northbound | | | | Southbound | | | | Eastbound | | | | Westbound | | | | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | U | Left | Thru | Right | U | Left | Thru | Right | U | Left | Thru | Right | U | |
| All Vehicles | 4 | 0 | 16 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 8 | 0 | 16 | 0 | 0 | 0 | 44 |
| Heavy Trucks | 0 | 0 | 0 | | 0 | 0 | 0 | | 0 | 0 | 0 | | 0 | 0 | 0 | | 0 |
| Pedestrians | | 4 | | | | 0 | | | | 0 | | | | 0 | | | 4 |
| Bicycles | | | | | | | | | | | | | | | | | |
| Railroad | | | | | | | | | | | | | | | | | |
| Stopped Buses | | | | | | | | | | | | | | | | | |

*Comments:*

Report generated on 3/17/2010 9:46 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net)

Type of peak hour being reported: Intersection Peak

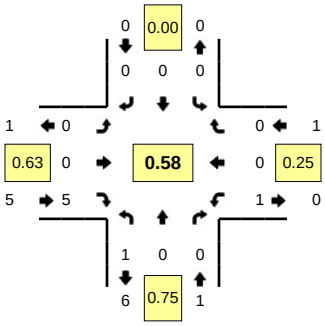
Method for determining peak hour: Total Entering Volume

**LOCATION:** Red Soils (West) -- Warner Milne Rd

**QC JOB #:** 10487706

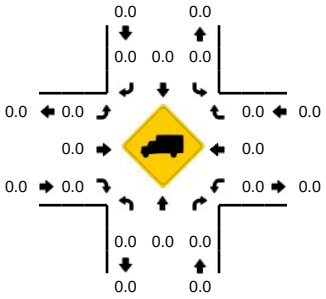
**CITY/STATE:** Oregon City, OR

**DATE:** 3/11/2010

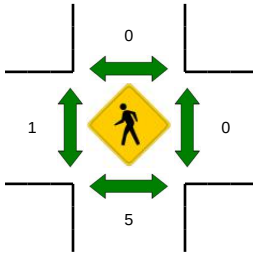


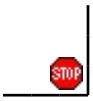

**Peak-Hour: 4:05 PM -- 5:05 PM**

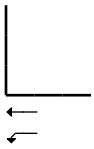
**Peak 15-Min: 4:50 PM -- 5:05 PM**

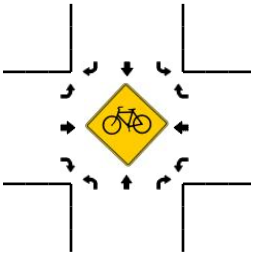


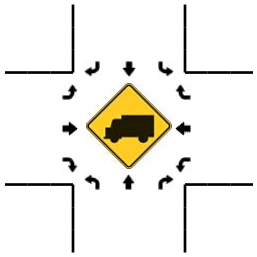


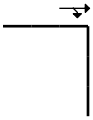


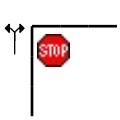



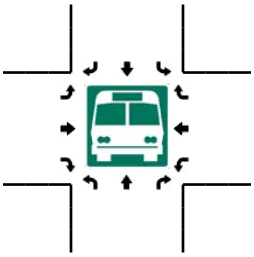











| 5-Min Count Period Beginning At | Red Soils (West) (Northbound) | | | | Red Soils (West) (Southbound) | | | | Warner Milne Rd (Eastbound) | | | | Warner Milne Rd (Westbound) | | | | Total | Hourly Totals |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | U | Left | Thru | Right | U | Left | Thru | Right | U | Left | Thru | Right | U | | |
| 4:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 4:05 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 2 | |
| 4:10 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 4:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 4:20 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | |
| 4:25 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | |
| 4:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 4:35 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 4:40 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 4:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 4:50 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | |
| 4:55 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 |
| 5:00 PM | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 2 | 7 |
| 5:05 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 |
| 5:10 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 |
| 5:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 |
| 5:20 PM | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 5 |
| 5:25 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 |
| 5:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 |
| 5:35 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 |
| 5:40 PM | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 5 |
| 5:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 6 |
| 5:50 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 |
| 5:55 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 |

| Peak 15-Min Flowrates | Northbound | | | | Southbound | | | | Eastbound | | | | Westbound | | | | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | U | Left | Thru | Right | U | Left | Thru | Right | U | Left | Thru | Right | U | |
| All Vehicles | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 8 | 0 | 0 | 0 | 0 | 0 | 12 |
| Heavy Trucks | 0 | 0 | 0 | | 0 | 0 | 0 | | 0 | 0 | 0 | | 0 | 0 | 0 | | 0 |
| Pedestrians | | 8 | | | | 0 | | | | 0 | | | | 0 | | | 8 |
| Bicycles | | | | | | | | | | | | | | | | | |
| Railroad | | | | | | | | | | | | | | | | | |
| Stopped Buses | | | | | | | | | | | | | | | | | |

*Comments:*

Report generated on 3/17/2010 9:46 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net)

Type of peak hour being reported: Intersection Peak

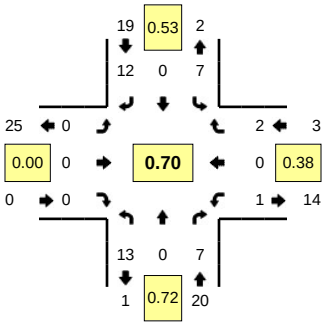
Method for determining peak hour: Total Entering Volume

**LOCATION:** PGE (West)/Red Soils (Center) -- Warner Milne Rd

**QC JOB #:** 10487704

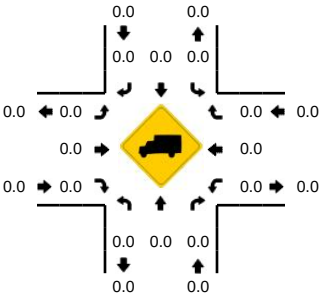
**CITY/STATE:** Oregon City, OR

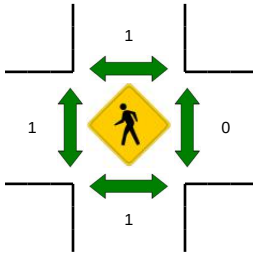
**DATE:** 3/11/2010

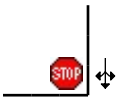


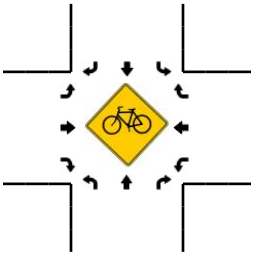

**Peak-Hour: 4:05 PM -- 5:05 PM**

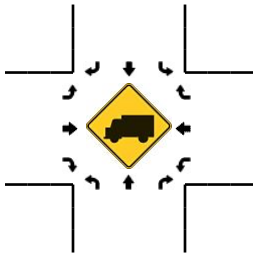
**Peak 15-Min: 4:05 PM -- 4:20 PM**

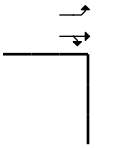


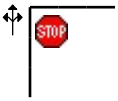



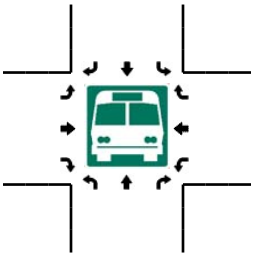









| 5-Min Count Period Beginning At | PGE (West)/Red Soils (Center) (Northbound) | | | | PGE (West)/Red Soils (Center) (Southbound) | | | | Warner Milne Rd (Eastbound) | | | | Warner Milne Rd (Westbound) | | | | Total | Hourly Totals |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | U | Left | Thru | Right | U | Left | Thru | Right | U | Left | Thru | Right | U | | |
| 4:00 PM | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | |
| 4:05 PM | 1 | 0 | 0 | 0 | 2 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 9 | |
| 4:10 PM | 0 | 0 | 2 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | |
| 4:15 PM | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | |
| 4:20 PM | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | |
| 4:25 PM | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | |
| 4:30 PM | 3 | 0 | 1 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 6 | |
| 4:35 PM | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | |
| 4:40 PM | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 3 | |
| 4:45 PM | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | |
| 4:50 PM | 1 | 0 | 2 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | |
| 4:55 PM | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 39 |
| 5:00 PM | 3 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 42 |
| 5:05 PM | 3 | 0 | 2 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 6 | 39 |
| 5:10 PM | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 36 |
| 5:15 PM | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 37 |
| 5:20 PM | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 36 |
| 5:25 PM | 2 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 37 |
| 5:30 PM | 3 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 35 |
| 5:35 PM | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 32 |
| 5:40 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 29 |
| 5:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 28 |
| 5:50 PM | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 26 |
| 5:55 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 25 |

| Peak 15-Min Flowrates | Northbound | | | | Southbound | | | | Eastbound | | | | Westbound | | | | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | U | Left | Thru | Right | U | Left | Thru | Right | U | Left | Thru | Right | U | |
| All Vehicles | 4 | 0 | 12 | 0 | 12 | 0 | 24 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 4 | 0 | 60 |
| Heavy Trucks | 0 | 0 | 0 | | 0 | 0 | 0 | | 0 | 0 | 0 | | 0 | 0 | 0 | | 0 |
| Pedestrians | | 0 | | | | 0 | | | | 0 | | | | 0 | | | 0 |
| Bicycles | | | | | | | | | | | | | | | | | |
| Railroad | | | | | | | | | | | | | | | | | |
| Stopped Buses | | | | | | | | | | | | | | | | | |

*Comments:*

Report generated on 3/17/2010 9:46 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net)

Type of peak hour being reported: Intersection Peak

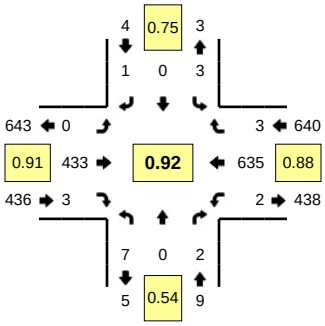
Method for determining peak hour: Total Entering Volume

**LOCATION:** PGE (East)/Red Soils (East) -- Warner Milne Rd

**QC JOB #:** 10487702

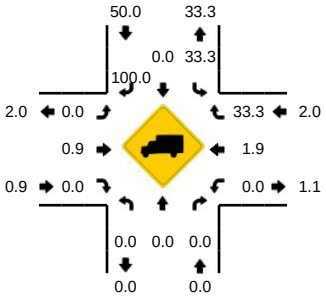
**CITY/STATE:** Oregon City, OR

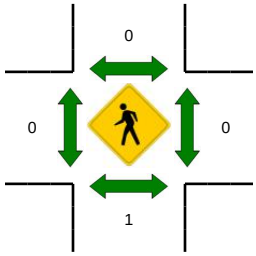
**DATE:** 3/11/2010

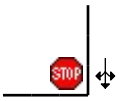


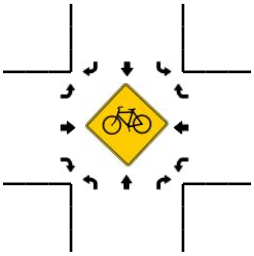

**Peak-Hour: 4:45 PM -- 5:45 PM**

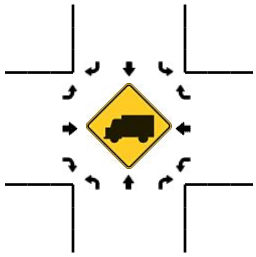
**Peak 15-Min: 5:00 PM -- 5:15 PM**

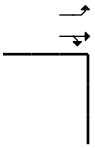



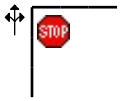



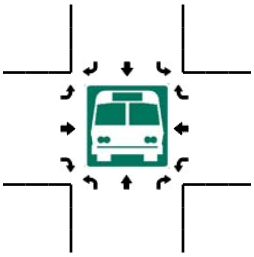









| 5-Min Count Period Beginning At | PGE (East)/Red Soils (East) (Northbound) | | | | PGE (East)/Red Soils (East) (Southbound) | | | | Warner Milne Rd (Eastbound) | | | | Warner Milne Rd (Westbound) | | | | Total | Hourly Totals |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | U | Left | Thru | Right | U | Left | Thru | Right | U | Left | Thru | Right | U | | |
| 4:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 36 | 0 | 0 | 0 | 51 | 0 | 0 | 87 | |
| 4:05 PM | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 44 | 0 | 0 | 0 | 45 | 0 | 0 | 91 | |
| 4:10 PM | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 40 | 1 | 0 | 0 | 37 | 0 | 0 | 79 | |
| 4:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 39 | 0 | 0 | 1 | 51 | 0 | 0 | 91 | |
| 4:20 PM | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 42 | 0 | 0 | 0 | 43 | 0 | 0 | 86 | |
| 4:25 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 34 | 0 | 0 | 0 | 51 | 1 | 0 | 86 | |
| 4:30 PM | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 37 | 0 | 0 | 0 | 57 | 0 | 0 | 95 | |
| 4:35 PM | 2 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 33 | 1 | 0 | 0 | 44 | 0 | 0 | 81 | |
| 4:40 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 31 | 0 | 0 | 0 | 41 | 0 | 0 | 72 | |
| 4:45 PM | 3 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 37 | 0 | 0 | 0 | 44 | 0 | 0 | 85 | |
| 4:50 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 32 | 0 | 0 | 0 | 61 | 1 | 0 | 94 | |
| 4:55 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 32 | 1 | 0 | 0 | 52 | 0 | 0 | 85 | 1032 |
| 5:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 42 | 0 | 0 | 1 | 47 | 0 | 0 | 91 | 1036 |
| 5:05 PM | 4 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 32 | 0 | 0 | 0 | 68 | 1 | 0 | 106 | 1051 |
| 5:10 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 35 | 0 | 0 | 0 | 64 | 0 | 0 | 99 | 1071 |
| 5:15 PM | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 45 | 0 | 0 | 0 | 40 | 0 | 0 | 86 | 1066 |
| 5:20 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 46 | 0 | 0 | 0 | 50 | 0 | 0 | 96 | 1076 |
| 5:25 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 27 | 0 | 0 | 0 | 52 | 0 | 0 | 79 | 1069 |
| 5:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 45 | 0 | 0 | 0 | 62 | 0 | 0 | 107 | 1081 |
| 5:35 PM | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 26 | 1 | 0 | 0 | 45 | 1 | 0 | 74 | 1074 |
| 5:40 PM | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 34 | 1 | 0 | 1 | 50 | 0 | 0 | 87 | 1089 |
| 5:45 PM | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 39 | 0 | 0 | 0 | 37 | 1 | 0 | 78 | 1082 |
| 5:50 PM | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 43 | 0 | 0 | 0 | 34 | 0 | 0 | 78 | 1066 |
| 5:55 PM | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 42 | 0 | 0 | 0 | 39 | 0 | 0 | 83 | 1064 |

| Peak 15-Min Flowrates | Northbound | | | | Southbound | | | | Eastbound | | | | Westbound | | | | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | U | Left | Thru | Right | U | Left | Thru | Right | U | Left | Thru | Right | U | |
| All Vehicles | 16 | 0 | 0 | 0 | 4 | 0 | 4 | 0 | 0 | 436 | 0 | 0 | 4 | 716 | 4 | 0 | 1184 |
| Heavy Trucks | 0 | 0 | 0 | | 4 | 0 | 4 | | 0 | 8 | 0 | | 0 | 12 | 0 | | 28 |
| Pedestrians | | 0 | | | | 0 | | | | 0 | | | | 0 | | | 0 |
| Bicycles | | | | | | | | | | | | | | | | | |
| Railroad | | | | | | | | | | | | | | | | | |
| Stopped Buses | | | | | | | | | | | | | | | | | |

*Comments:*

Report generated on 3/17/2010 9:46 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net)

# Traffic Counts – 24-Hour Tube Data

**LOCATION:** Warner Milne Rd btwn PGE E. and W. Dwys

**QC JOB #:** 10487709

**SPECIFIC LOCATION:** 0 ft from

**DIRECTION:** EB

**CITY/STATE:** Oregon City, OR

**DATE:** Mar 11 2010 - Mar 11 2010

| Start Time | Mon | Tue | Wed | Thu 11-Mar-10 | Fri | Average Weekday Hourly Traffic | Sat | Sun | Average Week Hourly Traffic | Average Week Profile |
|---|---|---|---|---|---|---|---|---|---|---|
| **12:00 AM** | | | | 26 | | 26 | | | 26 | |
| **1:00 AM** | | | | 7 | | 7 | | | 7 | |
| **2:00 AM** | | | | 7 | | 7 | | | 7 | |
| **3:00 AM** | | | | 9 | | 9 | | | 9 | |
| **4:00 AM** | | | | 33 | | 33 | | | 33 | |
| **5:00 AM** | | | | 83 | | 83 | | | 83 | |
| **6:00 AM** | | | | 222 | | 222 | | | 222 | |
| **7:00 AM** | | | | **450** | | **450** | | | **450** | |
| **8:00 AM** | | | | 424 | | 424 | | | 424 | |
| **9:00 AM** | | | | 349 | | 349 | | | 349 | |
| **10:00 AM** | | | | 368 | | 368 | | | 368 | |
| **11:00 AM** | | | | 416 | | 416 | | | 416 | |
| **12:00 PM** | | | | 436 | | 436 | | | 436 | |
| **1:00 PM** | | | | 371 | | 371 | | | 371 | |
| **2:00 PM** | | | | 429 | | 429 | | | 429 | |
| **3:00 PM** | | | | **445** | | **445** | | | **445** | |
| **4:00 PM** | | | | 402 | | 402 | | | 402 | |
| **5:00 PM** | | | | 439 | | 439 | | | 439 | |
| **6:00 PM** | | | | 383 | | 383 | | | 383 | |
| **7:00 PM** | | | | 284 | | 284 | | | 284 | |
| **8:00 PM** | | | | 184 | | 184 | | | 184 | |
| **9:00 PM** | | | | 117 | | 117 | | | 117 | |
| **10:00 PM** | | | | 69 | | 69 | | | 69 | |
| **11:00 PM** | | | | 28 | | 28 | | | 28 | |
| **Day Total** | | | | 5981 | | 5981 | | | 5981 | |
| % Weekday Average | | | | 100.0% | | | | | | |
| % Week Average | | | | 100.0% | | 100.0% | | | | |
| AM Peak Volume | | | | 7:00 AM 450 | | 7:00 AM 450 | | | 7:00 AM 450 | |
| PM Peak Volume | | | | 3:00 PM 445 | | 3:00 PM 445 | | | 3:00 PM 445 | |

*Comments:*

**LOCATION:** Warner Milne Rd btwn PGE E. and W. Dwys
**QC JOB #:** 10487709
**SPECIFIC LOCATION:** 0 ft from
**DIRECTION:** WB
**CITY/STATE:** Oregon City, OR
**DATE:** Mar 11 2010 - Mar 11 2010

| Start Time | Mon | Tue | Wed | Thu 11-Mar-10 | Fri | Average Weekday Hourly Traffic | Sat | Sun | Average Week Hourly Traffic | Average Week Profile |
|---|---|---|---|---|---|---|---|---|---|---|
| **12:00 AM** | | | | 33 | | 33 | | | 33 | |
| **1:00 AM** | | | | 12 | | 12 | | | 12 | |
| **2:00 AM** | | | | 13 | | 13 | | | 13 | |
| **3:00 AM** | | | | 6 | | 6 | | | 6 | |
| **4:00 AM** | | | | 14 | | 14 | | | 14 | |
| **5:00 AM** | | | | 36 | | 36 | | | 36 | |
| **6:00 AM** | | | | 108 | | 108 | | | 108 | |
| **7:00 AM** | | | | 201 | | 201 | | | 201 | |
| **8:00 AM** | | | | 246 | | 246 | | | 246 | |
| **9:00 AM** | | | | 251 | | 251 | | | 251 | |
| **10:00 AM** | | | | 307 | | 307 | | | 307 | |
| **11:00 AM** | | | | **373** | | **373** | | | **373** | |
| **12:00 PM** | | | | 420 | | 420 | | | 420 | |
| **1:00 PM** | | | | 402 | | 402 | | | 402 | |
| **2:00 PM** | | | | 410 | | 410 | | | 410 | |
| **3:00 PM** | | | | 554 | | 554 | | | 554 | |
| **4:00 PM** | | | | 566 | | 566 | | | 566 | |
| **5:00 PM** | | | | **577** | | **577** | | | **577** | |
| **6:00 PM** | | | | 569 | | 569 | | | 569 | |
| **7:00 PM** | | | | 358 | | 358 | | | 358 | |
| **8:00 PM** | | | | 253 | | 253 | | | 253 | |
| **9:00 PM** | | | | 189 | | 189 | | | 189 | |
| **10:00 PM** | | | | 125 | | 125 | | | 125 | |
| **11:00 PM** | | | | 43 | | 43 | | | 43 | |
| **Day Total** | | | | 6066 | | 6066 | | | 6066 | |
| % Weekday Average | | | | 100.0% | | | | | | |
| % Week Average | | | | 100.0% | | 100.0% | | | | |
| AM Peak | | | | 11:00 AM | | 11:00 AM | | | 11:00 AM | |
| Volume | | | | 373 | | 373 | | | 373 | |
| PM Peak | | | | 5:00 PM | | 5:00 PM | | | 5:00 PM | |
| Volume | | | | 577 | | 577 | | | 577 | |

*Comments:*

**LOCATION:** Warner Milne Rd btwn PGE E. and W. Dwys
**SPECIFIC LOCATION:** 0 ft from
**CITY/STATE:** Oregon City, OR

**QC JOB #:** 10487709
**DIRECTION:** EB
**DATE:** Mar 11 2010

| Start Time | 1<br>15 | 16<br>20 | 21<br>25 | 26<br>30 | 31<br>35 | 36<br>40 | 41<br>45 | 46<br>50 | 51<br>55 | 56<br>60 | 61<br>65 | 66<br>70 | 71<br>75 | 76<br>999 | Total | Pace Speed | Number in Pace |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **12:00 AM** | 0 | 0 | 1 | 10 | 11 | 3 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 26 | 26-35 | 21 |
| **1:00 AM** | 0 | 0 | 1 | 1 | 3 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 31-40 | 5 |
| **2:00 AM** | 0 | 0 | 0 | 4 | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 26-35 | 6 |
| **3:00 AM** | 0 | 0 | 0 | 5 | 3 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 9 | 26-35 | 8 |
| **4:00 AM** | 0 | 0 | 0 | 8 | 19 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 33 | 28-37 | 26 |
| **5:00 AM** | 0 | 0 | 4 | 24 | 43 | 10 | **2** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 83 | 26-35 | 67 |
| **6:00 AM** | 4 | 1 | 15 | 87 | 100 | **15** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 222 | 26-35 | 186 |
| **7:00 AM** | 16 | 5 | 52 | **226** | **138** | 12 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **450** | 26-35 | 364 |
| **8:00 AM** | 20 | **7** | 72 | 214 | 107 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 424 | 26-35 | 320 |
| **9:00 AM** | 9 | 7 | 61 | 177 | 90 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 349 | 26-35 | 267 |
| **10:00 AM** | 21 | 5 | 60 | 210 | 69 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 368 | 26-35 | 279 |
| **11:00 AM** | **22** | 4 | **85** | 218 | 81 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 416 | 22-31 | 302 |
| **12:00 PM** | 33 | 9 | 89 | 233 | 69 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 436 | 21-30 | 321 |
| **1:00 PM** | 35 | **12** | 78 | 168 | 72 | 5 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 371 | 21-30 | 245 |
| **2:00 PM** | **49** | 11 | **106** | 183 | 73 | 5 | **2** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 429 | 21-30 | 288 |
| **3:00 PM** | 33 | 6 | 96 | 233 | 72 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **445** | 21-30 | 328 |
| **4:00 PM** | 35 | 7 | 52 | 206 | 89 | 13 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 402 | 26-35 | 295 |
| **5:00 PM** | 39 | 3 | 42 | **240** | 105 | 9 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 439 | 26-35 | 345 |
| **6:00 PM** | 31 | 4 | 14 | 193 | **129** | 12 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 383 | 26-35 | 321 |
| **7:00 PM** | 20 | 0 | 16 | 109 | 125 | 13 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 284 | 26-35 | 233 |
| **8:00 PM** | 8 | 3 | 8 | 68 | 82 | **14** | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 184 | 26-35 | 150 |
| **9:00 PM** | 2 | 0 | 7 | 49 | 49 | 8 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 117 | 26-35 | 98 |
| **10:00 PM** | 0 | 0 | 4 | 30 | 30 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 69 | 26-35 | 60 |
| **11:00 PM** | 0 | 0 | 3 | 11 | 11 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 28 | 26-35 | 22 |
| **Day Total** | 377 | 84 | 866 | 2907 | 1572 | 163 | 12 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5981 | 26-35 | 4479 |
| **Percent** | 6.3% | 1.4% | 14.5% | 48.6% | 26.3% | 2.7% | 0.2% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | | | |

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AM Peak | 11:00 AM | 8:00 AM | 11:00 AM | 7:00 AM | 7:00 AM | 6:00 AM | 5:00 AM | | | | | | | | 7:00 AM | | |
| Volume | 22 | 7 | 85 | 226 | 138 | 15 | 2 | | | | | | | | 450 | | |
| PM Peak | 2:00 PM | 1:00 PM | 2:00 PM | 5:00 PM | 6:00 PM | 8:00 PM | 2:00 PM | | | | | | | | 3:00 PM | | |
| Volume | 49 | 12 | 106 | 240 | 129 | 14 | 2 | | | | | | | | 445 | | |

*Comments:*

# SUMMARY - Tube Count - Speed Data



**LOCATION:** Warner Milne Rd btwn PGE E. and W. Dwys
**QC JOB #:** 10487709
**SPECIFIC LOCATION:** 0 ft from
**DIRECTION:** EB
**CITY/STATE:** Oregon City, OR
**DATE:** Mar 11 2010 - Mar 11 2010

| Start Time | 1<br>15 | 16<br>20 | 21<br>25 | 26<br>30 | 31<br>35 | 36<br>40 | 41<br>45 | 46<br>50 | 51<br>55 | 56<br>60 | 61<br>65 | 66<br>70 | 71<br>75 | 76<br>999 | Total | Pace Speed | Number in Pace |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Grand Total** | 377 | 84 | 866 | 2907 | 1572 | 163 | 12 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5981 | 26-35 | 4479 |
| **Percent** | 6.3% | 1.4% | 14.5% | 48.6% | 26.3% | 2.7% | 0.2% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | | | |
| **Cumulative Percent** | 6.3% | 7.7% | 22.2% | 70.8% | 97.1% | 99.8% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | | | |

**85th Percentile:** 32 MPH

**Mean Speed(Average):** 26 MPH
**Median** 27 MPH
**Mode:** 28 MPH

*Comments:*

Report generated on 3/17/2010 9:47 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net)

**LOCATION:** Warner Milne Rd btwn PGE E. and W. Dwys
**SPECIFIC LOCATION:** 0 ft from
**CITY/STATE:** Oregon City, OR

**QC JOB #:** 10487709
**DIRECTION:** WB
**DATE:** Mar 11 2010

| Start Time | 1<br>15 | 16<br>20 | 21<br>25 | 26<br>30 | 31<br>35 | 36<br>40 | 41<br>45 | 46<br>50 | 51<br>55 | 56<br>60 | 61<br>65 | 66<br>70 | 71<br>75 | 76<br>999 | Total | Pace Speed | Number in Pace |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **12:00 AM** | 0 | 0 | 4 | 13 | 14 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 33 | 26-35 | 26 |
| **1:00 AM** | 0 | 0 | 0 | 7 | 3 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 12 | 26-35 | 10 |
| **2:00 AM** | 0 | 0 | 3 | 6 | 3 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 13 | 26-35 | 9 |
| **3:00 AM** | 0 | 0 | 0 | 5 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 6 | 26-35 | 6 |
| **4:00 AM** | 0 | 0 | 2 | 6 | 3 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 14 | 26-35 | 9 |
| **5:00 AM** | 0 | 4 | 10 | 17 | 3 | 1 | **1** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 36 | 21-30 | 27 |
| **6:00 AM** | 7 | 6 | 34 | 45 | 16 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 108 | 21-30 | 79 |
| **7:00 AM** | 17 | 3 | 37 | 105 | 37 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 201 | 26-35 | 142 |
| **8:00 AM** | 24 | 4 | 56 | 111 | 48 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 246 | 21-30 | 167 |
| **9:00 AM** | 13 | 7 | 72 | 115 | 41 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 251 | 21-30 | 186 |
| **10:00 AM** | 15 | 8 | 59 | 159 | **60** | 4 | 1 | 0 | **1** | 0 | 0 | 0 | 0 | 0 | 307 | 26-35 | 218 |
| **11:00 AM** | **27** | **19** | **85** | **182** | 53 | **7** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **373** | 21-30 | 267 |
| **12:00 PM** | 32 | 19 | 132 | 196 | 39 | 1 | **1** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 420 | 21-30 | 328 |
| **1:00 PM** | 22 | 21 | **136** | 191 | 30 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 402 | 21-30 | 327 |
| **2:00 PM** | 44 | 13 | 105 | 198 | 43 | **6** | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 410 | 21-30 | 302 |
| **3:00 PM** | 37 | **25** | 136 | 279 | 73 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 554 | 21-30 | 415 |
| **4:00 PM** | **61** | 14 | 115 | 297 | 77 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 566 | 21-30 | 412 |
| **5:00 PM** | 51 | 11 | 124 | 313 | 75 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **577** | 21-30 | 436 |
| **6:00 PM** | 32 | 11 | 94 | **332** | **97** | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 569 | 26-35 | 429 |
| **7:00 PM** | 13 | 2 | 71 | 208 | 62 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 358 | 21-30 | 278 |
| **8:00 PM** | 9 | 7 | 47 | 156 | 29 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 253 | 21-30 | 203 |
| **9:00 PM** | 5 | 0 | 18 | 106 | 55 | 4 | 0 | **1** | 0 | 0 | 0 | 0 | 0 | 0 | 189 | 26-35 | 161 |
| **10:00 PM** | 1 | 0 | 21 | 60 | 41 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 125 | 26-35 | 100 |
| **11:00 PM** | 0 | 1 | 4 | 19 | 14 | 2 | 1 | 0 | 0 | **1** | **1** | 0 | 0 | 0 | 43 | 26-35 | 32 |
| **Day Total** | 410 | 175 | 1365 | 3126 | 917 | 64 | 5 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 6066 | 21-30 | 4491 |
| **Percent** | 6.8% | 2.9% | 22.5% | 51.5% | 15.1% | 1.1% | 0.1% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | | | |

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AM Peak | 11:00 AM | 11:00 AM | 11:00 AM | 11:00 AM | 10:00 AM | 11:00 AM | 5:00 AM | | 10:00 AM | | | | | | 11:00 AM | | |
| Volume | 27 | 19 | 85 | 182 | 60 | 7 | 1 | | 1 | | | | | | 373 | | |
| PM Peak | 4:00 PM | 3:00 PM | 1:00 PM | 6:00 PM | 6:00 PM | 2:00 PM | 12:00 PM | 9:00 PM | | 11:00 PM | 11:00 PM | | | | 5:00 PM | | |
| Volume | 61 | 25 | 136 | 332 | 97 | 6 | 1 | 1 | | 1 | 1 | | | | 577 | | |

*Comments:*

# SUMMARY - Tube Count - Speed Data



**LOCATION:** Warner Milne Rd btwn PGE E. and W. Dwys
**QC JOB #:** 10487709
**SPECIFIC LOCATION:** 0 ft from
**DIRECTION:** WB
**CITY/STATE:** Oregon City, OR
**DATE:** Mar 11 2010 - Mar 11 2010

| Start Time | 1<br>15 | 16<br>20 | 21<br>25 | 26<br>30 | 31<br>35 | 36<br>40 | 41<br>45 | 46<br>50 | 51<br>55 | 56<br>60 | 61<br>65 | 66<br>70 | 71<br>75 | 76<br>999 | Total | Pace Speed | Number in Pace |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Grand Total** | 410 | 175 | 1365 | 3126 | 917 | 64 | 5 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 6066 | 21-30 | 4491 |
| **Percent** | 6.8% | 2.9% | 22.5% | 51.5% | 15.1% | 1.1% | 0.1% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | | | |
| **Cumulative Percent** | 6.8% | 9.6% | 32.1% | 83.7% | 98.8% | 99.9% | 99.9% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | | | |

**85th Percentile:** 30 MPH

**Mean Speed(Average):** 25 MPH
**Median** 26 MPH
**Mode:** 28 MPH

*Comments:*

Report generated on 3/17/2010 9:47 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net)

**LOCATION:** Warner Milne Rd btwn PGE E. and W. Dwys
**QC JOB #:** 10487709
**SPECIFIC LOCATION:** 0 ft from
**DIRECTION:** EB
**CITY/STATE:** Oregon City, OR
**DATE:** Mar 11 2010

| Start Time | Bikes | Cars & Trailer | 2 Axle Long | Buses | 2 Axle 6 Tire | 3 Axle Single | 4 Axle Single | <5 Axle Double | 5 Axle Double | >6 Axle Double | <6 Axle Multi | 6 Axle Multi | >6 Axle Multi | Not Classified | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **12:00 AM** | 0 | 21 | 4 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 26 |
| **1:00 AM** | 0 | 4 | 2 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7 |
| **2:00 AM** | 0 | 4 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7 |
| **3:00 AM** | 0 | 7 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 9 |
| **4:00 AM** | 0 | 21 | 4 | 0 | 6 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 33 |
| **5:00 AM** | 0 | 56 | 23 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 83 |
| **6:00 AM** | 2 | 138 | 56 | 5 | 15 | 0 | 0 | 1 | **1** | 0 | 0 | 0 | 0 | 4 | 222 |
| **7:00 AM** | 3 | **295** | **92** | **12** | **28** | 2 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 17 | **450** |
| **8:00 AM** | 5 | 282 | 80 | 10 | 17 | **3** | 0 | **6** | 0 | 0 | 0 | 0 | 0 | 21 | 424 |
| **9:00 AM** | 0 | 234 | 84 | 2 | 14 | 0 | **1** | 3 | 1 | 0 | 0 | 0 | 0 | 10 | 349 |
| **10:00 AM** | 2 | 240 | 81 | 3 | 15 | 2 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 23 | 368 |
| **11:00 AM** | **7** | 267 | 88 | 6 | 22 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | **24** | 416 |
| **12:00 PM** | **10** | 267 | **100** | 2 | 17 | 4 | 0 | **3** | 0 | 0 | 0 | 0 | 0 | 33 | 436 |
| **1:00 PM** | 10 | 225 | 77 | 6 | 19 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 33 | 371 |
| **2:00 PM** | 8 | 241 | 90 | **9** | **23** | 1 | **1** | 1 | **1** | **1** | 0 | 0 | 0 | **53** | 429 |
| **3:00 PM** | 10 | 276 | 91 | 9 | 18 | 0 | 0 | 2 | 1 | 0 | 0 | 0 | 0 | 38 | **445** |
| **4:00 PM** | 10 | 266 | 60 | 4 | 16 | **7** | 1 | 2 | 1 | 0 | 0 | 0 | 0 | 35 | 402 |
| **5:00 PM** | 7 | **287** | 86 | 2 | 12 | 3 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 40 | 439 |
| **6:00 PM** | 6 | 242 | 78 | 3 | 19 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 32 | 383 |
| **7:00 PM** | 2 | 196 | 49 | 3 | 12 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 21 | 284 |
| **8:00 PM** | 2 | 131 | 32 | 1 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 8 | 184 |
| **9:00 PM** | 2 | 87 | 23 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 117 |
| **10:00 PM** | 1 | 55 | 9 | 2 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 69 |
| **11:00 PM** | 0 | 22 | 2 | 2 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 28 |
| **Day Total** | 87 | 3864 | 1216 | 83 | 272 | 29 | 4 | 25 | 5 | 1 | 0 | 0 | 0 | 395 | 5981 |
| **Percent** | 1.5% | 64.6% | 20.3% | 1.4% | 4.5% | 0.5% | 0.1% | 0.4% | 0.1% | 0.0% | 0.0% | 0.0% | 0.0% | 6.6% | |

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AM Peak | 11:00 AM | 7:00 AM | 7:00 AM | 7:00 AM | 7:00 AM | 8:00 AM | 9:00 AM | 8:00 AM | 6:00 AM | | | | | 11:00 AM | 7:00 AM |
| Volume | 7 | 295 | 92 | 12 | 28 | 3 | 1 | 6 | 1 | | | | | 24 | 450 |
| PM Peak | 12:00 PM | 5:00 PM | 12:00 PM | 2:00 PM | 2:00 PM | 4:00 PM | 2:00 PM | 12:00 PM | 2:00 PM | 2:00 PM | | | | 2:00 PM | 3:00 PM |
| Volume | 10 | 287 | 100 | 9 | 23 | 7 | 1 | 3 | 1 | 1 | | | | 53 | 445 |

*Comments:*

**SUMMARY - Tube Count - Vehicle Classification Data**



**LOCATION:** Warner Milne Rd btwn PGE E. and W. Dwys
**QC JOB #:** 10487709
**SPECIFIC LOCATION:** 0 ft from
**DIRECTION:** EB
**CITY/STATE:** Oregon City, OR
**DATE:** Mar 11 2010 - Mar 11 2010

| Start Time | Bikes | Cars & Trailer | 2 Axle Long | Buses | 2 Axle 6 Tire | 3 Axle Single | 4 Axle Single | <5 Axle Double | 5 Axle Double | >6 Axle Double | <6 Axle Multi | 6 Axle Multi | >6 Axle Multi | Not Classified | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Grand Total** | 87 | 3864 | 1216 | 83 | 272 | 29 | 4 | 25 | 5 | 1 | 0 | 0 | 0 | 395 | 5981 |
| **Percent** | 1.5% | 64.6% | 20.3% | 1.4% | 4.5% | 0.5% | 0.1% | 0.4% | 0.1% | 0.0% | 0.0% | 0.0% | 0.0% | 6.6% | |

*Comments:*

Report generated on 3/17/2010 9:47 AM

**LOCATION:** Warner Milne Rd btwn PGE E. and W. Dwys
**QC JOB #:** 10487709
**SPECIFIC LOCATION:** 0 ft from
**DIRECTION:** WB
**CITY/STATE:** Oregon City, OR
**DATE:** Mar 11 2010

| Start Time | Bikes | Cars & Trailer | 2 Axle Long | Buses | 2 Axle 6 Tire | 3 Axle Single | 4 Axle Single | <5 Axle Double | 5 Axle Double | >6 Axle Double | <6 Axle Multi | 6 Axle Multi | >6 Axle Multi | Not Classified | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **12:00 AM** | 0 | 27 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 33 |
| **1:00 AM** | 0 | 10 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 12 |
| **2:00 AM** | 0 | 11 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 13 |
| **3:00 AM** | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 6 |
| **4:00 AM** | 0 | 8 | 3 | 2 | 0 | 0 | 0 | 0 | **1** | 0 | 0 | 0 | 0 | 0 | 14 |
| **5:00 AM** | 0 | 19 | 8 | 3 | 3 | 0 | 0 | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 36 |
| **6:00 AM** | 0 | 63 | 23 | 7 | 7 | **1** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 108 |
| **7:00 AM** | 5 | 107 | 48 | **12** | 11 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 17 | 201 |
| **8:00 AM** | **6** | 127 | 54 | 4 | **19** | 1 | 0 | **8** | 0 | 0 | 0 | 0 | 0 | **27** | 246 |
| **9:00 AM** | 0 | 159 | 62 | 4 | 10 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 13 | 251 |
| **10:00 AM** | 6 | 195 | 72 | 6 | 9 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 17 | 307 |
| **11:00 AM** | 6 | **205** | **113** | 3 | 19 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 25 | **373** |
| **12:00 PM** | **13** | 274 | 76 | 3 | 19 | **4** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 31 | 420 |
| **1:00 PM** | 9 | 249 | 84 | **10** | 19 | 2 | **1** | **5** | 0 | **2** | 0 | 0 | 0 | 21 | 402 |
| **2:00 PM** | 10 | 248 | 81 | 7 | 18 | 1 | 0 | 3 | **1** | 0 | 0 | 0 | 0 | 41 | 410 |
| **3:00 PM** | 7 | 355 | **124** | 8 | 14 | 3 | 1 | 2 | 0 | 0 | 0 | 0 | 0 | 40 | 554 |
| **4:00 PM** | 13 | 363 | 92 | 5 | **24** | 4 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | **64** | 566 |
| **5:00 PM** | 8 | 384 | 107 | 2 | 19 | 2 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 51 | **577** |
| **6:00 PM** | 7 | **398** | 106 | 2 | 21 | 1 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 32 | 569 |
| **7:00 PM** | 3 | 250 | 73 | 1 | 18 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 13 | 358 |
| **8:00 PM** | 1 | 188 | 43 | 1 | 10 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 8 | 253 |
| **9:00 PM** | 1 | 130 | 45 | 1 | 5 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 5 | 189 |
| **10:00 PM** | 0 | 96 | 23 | 1 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 125 |
| **11:00 PM** | 0 | 29 | 12 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 43 |
| **Day Total** | 95 | 3901 | 1258 | 84 | 250 | 24 | 2 | 34 | 3 | 2 | 0 | 0 | 0 | 413 | 6066 |
| **Percent** | 1.6% | 64.3% | 20.7% | 1.4% | 4.1% | 0.4% | 0.0% | 0.6% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 6.8% | |

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AM Peak | 8:00 AM | 11:00 AM | 11:00 AM | 7:00 AM | 8:00 AM | 6:00 AM | | 8:00 AM | 4:00 AM | | | | | 8:00 AM | 11:00 AM |
| Volume | 6 | 205 | 113 | 12 | 19 | 1 | | 8 | 1 | | | | | 27 | 373 |
| PM Peak | 12:00 PM | 6:00 PM | 3:00 PM | 1:00 PM | 4:00 PM | 12:00 PM | 1:00 PM | 1:00 PM | 2:00 PM | 1:00 PM | | | | 4:00 PM | 5:00 PM |
| Volume | 13 | 398 | 124 | 10 | 24 | 4 | 1 | 5 | 1 | 2 | | | | 64 | 577 |

*Comments:*

**SUMMARY - Tube Count - Vehicle Classification Data**



**LOCATION:** Warner Milne Rd btwn PGE E. and W. Dwys
**QC JOB #:** 10487709
**SPECIFIC LOCATION:** 0 ft from
**DIRECTION:** WB
**CITY/STATE:** Oregon City, OR
**DATE:** Mar 11 2010 - Mar 11 2010

| Start Time | Bikes | Cars & Trailer | 2 Axle Long | Buses | 2 Axle 6 Tire | 3 Axle Single | 4 Axle Single | <5 Axle Double | 5 Axle Double | >6 Axle Double | <6 Axle Multi | 6 Axle Multi | >6 Axle Multi | Not Classified | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Grand Total** | 95 | 3901 | 1258 | 84 | 250 | 24 | 2 | 34 | 3 | 2 | 0 | 0 | 0 | 413 | 6066 |
| **Percent** | 1.6% | 64.3% | 20.7% | 1.4% | 4.1% | 0.4% | 0.0% | 0.6% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 6.8% | |

*Comments:*

Report generated on 3/17/2010 9:47 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net)

# Level of Service Descriptions

## TRAFFIC LEVELS OF SERVICE

Analysis of traffic volumes is useful in understanding the general nature of traffic in an area, but by itself indicates neither the ability of the street network to carry additional traffic nor the quality of service afforded by the street facilities. For this, the concept of *level of service* has been developed to subjectively describe traffic performance. Level of service can be measured at intersections and along key roadway segments.

Level of service categories are similar to report card ratings for traffic performance. Intersections are typically the controlling bottlenecks of traffic flow and the ability of a roadway system to carry traffic efficiently is generally diminished in their vicinities. Levels of Service A, B and C indicate conditions where traffic moves without significant delays over periods of peak travel demand. Level of service D and E are progressively worse peak hour operating conditions and F conditions represent where demand exceeds the capacity of an intersection. Most urban communities set level of service D as the minimum acceptable level of service for peak hour operation and plan for level of service C or better for all other times of the day. The *Highway Capacity Manual* provides level of service calculation methodology for both intersections and arterials.[1] The following two sections provide interpretations of the analysis approaches.

[1] *2000 Highway Capacity Manual*, Transportation Research Board, Washington D.C., 2000, Chapters 16 and 17.

**UNSIGNALIZED INTERSECTIONS (Two-Way Stop Controlled)**

Unsignalized intersection level of service is reported for the major street and minor street (generally, left turn movements). The method assesses available and critical gaps in the traffic stream which make it possible for side street traffic to enter the main street flow. The *2000 Highway Capacity Manual* describes the detailed methodology. It is not unusual for an intersection to experience level of service E or F conditions for the minor street left turn movement. It should be understood that, often, a poor level of service is experienced by only a few vehicles and the intersection as a whole operates acceptably.

Unsignalized intersection levels of service are described in the following table.

| Level of Service | Expected Delay | (Sec/Veh) |
|---|---|---|
| A | Little or no delay | 0-10.0 |
| B | Short traffic delay | >10.1-15.0 |
| C | Average traffic delays | >15.1-25.0 |
| D | Long traffic delays | >25.1-35.0 |
| E | Very long traffic delays | >35.1-50.0 |
| F | Extreme delays potentially affecting other traffic movements in the intersection | > 50 |

Source: 2000 *Highway Capacity Manual*, Transportation Research Board Washington, D.C.

## SIGNALIZED INTERSECTIONS

For signalized intersections, level of service is evaluated based upon average vehicle delay experienced by vehicles entering an intersection. Control delay (or signal delay) includes initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay. In previous versions of this chapter of the HCM (1994 and earlier), delay included only stopped delay. As delay increases, the level of service decreases. Calculations for signalized and unsignalized intersections are different due to the variation in traffic control. The *2000 Highway Capacity Manual* provides the basis for these calculations.

| Level of Service | Delay (secs.) | Description |
|---|---|---|
| A | ≤10.00 | **Free Flow/Insignificant Delays:** No approach phase is fully utilized by traffic and no vehicle waits longer than one red indication. Most vehicles do not stop at all. Progression is extremely favorable and most vehicles arrive during the green phase. |
| B | 10.1-20.0 | **Stable Operation/Minimal Delays:** An occasional approach phase is fully utilized. Many drivers begin to feel somewhat restricted within platoons of vehicles. This level generally occurs with good progression, short cycle lengths, or both. |
| C | 20.1-35.0 | **Stable Operation/Acceptable Delays:** Major approach phases fully utilized. Most drivers feel somewhat restricted. Higher delays may result from fair progression, longer cycle lengths, or both. Individual cycle failures may begin to appear at this level, and the number of vehicles stopping is significant. |
| D | 35.1-55.0 | **Approaching Unstable/Tolerable Delays:** The influence of congestion becomes more noticeable. Drivers may have to wait through more than one red signal indication. Longer delays may result from some combination of unfavorable progression, long cycle lengths, or high v/c ratios. The proportion of vehicles not stopping declines, and individual cycle failures are noticeable. |
| E | 55.1-80.0 | **Unstable Operation/Significant Delays:** Volumes at or near capacity. Vehicles may wait though several signal cycles. Long queues form upstream from intersection. These high delay values generally indicate poor progression, long cycle lengths, and high v/c ratios. Individual cycle failures are a frequent occurrence. |
| F | ≥80.0 | **Forced Flow/Excessive Delays:** Represents jammed conditions. Queues may block upstream intersections. This level occurs when arrival flow rates exceed intersection capacity, and is considered to be unacceptable to most drivers. Poor progression, long cycle lengths, and v/c ratios approaching 1.0 may contribute to these high delay levels. |

Source: *2000 Highway Capacity Manual*, Transportation Research Board, Washington D.C.

# HCM Analysis – With Turn Lanes

| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Sign Control | Free | | | Free | Stop | |
| Grade | 0% | | | 0% | 0% | |
| Volume (veh/h) | 512 | 7 | 2 | 233 | 7 | 9 |
| Peak Hour Factor | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 |
| Hourly flow rate (vph) | 582 | 8 | 2 | 265 | 8 | 10 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | | | TWLTL | |
| Median storage veh) | | | | | 1 | |
| Upstream signal (ft) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | | | 590 | | 855 | 586 |
| vC1, stage 1 conf vol | | | | | 586 | |
| vC2, stage 2 conf vol | | | | | 269 | |
| vCu, unblocked vol | | | 590 | | 855 | 586 |
| tC, single (s) | | | 4.1 | | 6.4 | 6.2 |
| tC, 2 stage (s) | | | | | 5.4 | |
| tF (s) | | | 2.2 | | 3.5 | 3.3 |
| p0 queue free % | | | 100 | | 98 | 98 |
| cM capacity (veh/h) | | | 996 | | 440 | 514 |

| Direction, Lane # | EB 1 | WB 1 | WB 2 | NB 1 |
|---|---|---|---|---|
| Volume Total | 590 | 2 | 265 | 18 |
| Volume Left | 0 | 2 | 0 | 8 |
| Volume Right | 8 | 0 | 0 | 10 |
| cSH | 1700 | 996 | 1700 | 479 |
| Volume to Capacity | 0.35 | 0.00 | 0.16 | 0.04 |
| Queue Length 95th (ft) | 0 | 0 | 0 | 3 |
| Control Delay (s) | 0.0 | 8.6 | 0.0 | 12.8 |
| Lane LOS | | A | | B |
| Approach Delay (s) | 0.0 | 0.1 | | 12.8 |
| Approach LOS | | | | B |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 0.3 | | |
| Intersection Capacity Utilization | 38.9% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |





| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Sign Control | Free | | | Free | Stop | |
| Grade | 0% | | | 0% | 0% | |
| Volume (veh/h) | 495 | 26 | 2 | 235 | 0 | 0 |
| Peak Hour Factor | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 |
| Hourly flow rate (vph) | 562 | 30 | 2 | 267 | 0 | 0 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | | | TWLTL | |
| Median storage veh) | | | | | 1 | |
| Upstream signal (ft) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | | | 592 | | 849 | 577 |
| vC1, stage 1 conf vol | | | | | 577 | |
| vC2, stage 2 conf vol | | | | | 272 | |
| vCu, unblocked vol | | | 592 | | 849 | 577 |
| tC, single (s) | | | 4.1 | | 6.4 | 6.2 |
| tC, 2 stage (s) | | | | | 5.4 | |
| tF (s) | | | 2.2 | | 3.5 | 3.3 |
| p0 queue free % | | | 100 | | 100 | 100 |
| cM capacity (veh/h) | | | 994 | | 443 | 520 |

| Direction, Lane # | EB 1 | WB 1 | WB 2 |
|---|---|---|---|
| Volume Total | 592 | 2 | 267 |
| Volume Left | 0 | 2 | 0 |
| Volume Right | 30 | 0 | 0 |
| cSH | 1700 | 994 | 1700 |
| Volume to Capacity | 0.35 | 0.00 | 0.16 |
| Queue Length 95th (ft) | 0 | 0 | 0 |
| Control Delay (s) | 0.0 | 8.6 | 0.0 |
| Lane LOS | | A | |
| Approach Delay (s) | 0.0 | 0.1 | |
| Approach LOS | | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 0.0 | | |
| Intersection Capacity Utilization | 39.2% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

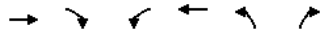
| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Sign Control | Free | | | Free | Stop | |
| Grade | 0% | | | 0% | 0% | |
| Volume (veh/h) | 495 | 0 | 0 | 237 | 0 | 0 |
| Peak Hour Factor | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 |
| Hourly flow rate (vph) | 562 | 0 | 0 | 269 | 0 | 0 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | | | TWLTL | |
| Median storage veh) | | | | | 1 | |
| Upstream signal (ft) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | | | 562 | | 832 | 562 |
| vC1, stage 1 conf vol | | | | | 562 | |
| vC2, stage 2 conf vol | | | | | 269 | |
| vCu, unblocked vol | | | 562 | | 832 | 562 |
| tC, single (s) | | | 4.1 | | 6.4 | 6.2 |
| tC, 2 stage (s) | | | | | 5.4 | |
| tF (s) | | | 2.2 | | 3.5 | 3.3 |
| p0 queue free % | | | 100 | | 100 | 100 |
| cM capacity (veh/h) | | | 1019 | | 451 | 530 |

| Direction, Lane # | EB 1 | WB 1 | NB 1 |
|---|---|---|---|
| Volume Total | 562 | 269 | 0 |
| Volume Left | 0 | 0 | 0 |
| Volume Right | 0 | 0 | 0 |
| cSH | 1700 | 1700 | 1700 |
| Volume to Capacity | 0.33 | 0.16 | 0.00 |
| Queue Length 95th (ft) | 0 | 0 | 0 |
| Control Delay (s) | 0.0 | 0.0 | 0.0 |
| Lane LOS | | | A |
| Approach Delay (s) | 0.0 | 0.0 | 0.0 |
| Approach LOS | | | A |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | | 0.0 | |
| Intersection Capacity Utilization | | 39.2% | ICU Level of Service A |
| Analysis Period (min) | | 15 | |



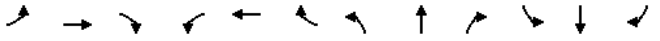




| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Sign Control | Free | | | Free | Stop | |
| Grade | 0% | | | 0% | 0% | |
| Volume (veh/h) | 493 | 2 | 2 | 237 | 0 | 0 |
| Peak Hour Factor | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 |
| Hourly flow rate (vph) | 560 | 2 | 2 | 269 | 0 | 0 |
| Pedestrians | | | | | 7 | |
| Lane Width (ft) | | | | | 0.0 | |
| Walking Speed (ft/s) | | | | | 4.0 | |
| Percent Blockage | | | | | 0 | |
| Right turn flare (veh) | | | | | | |
| Median type | | | | | TWLTL | |
| Median storage veh) | | | | | 1 | |
| Upstream signal (ft) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | | | 570 | | 842 | 568 |
| vC1, stage 1 conf vol | | | | | 568 | |
| vC2, stage 2 conf vol | | | | | 274 | |
| vCu, unblocked vol | | | 570 | | 842 | 568 |
| tC, single (s) | | | 4.1 | | 6.4 | 6.2 |
| tC, 2 stage (s) | | | | | 5.4 | |
| tF (s) | | | 2.2 | | 3.5 | 3.3 |
| p0 queue free % | | | 100 | | 100 | 100 |
| cM capacity (veh/h) | | | 1013 | | 446 | 526 |

| Direction, Lane # | EB 1 | WB 1 | WB 2 |
|---|---|---|---|
| Volume Total | 562 | 2 | 269 |
| Volume Left | 0 | 2 | 0 |
| Volume Right | 2 | 0 | 0 |
| cSH | 1700 | 1013 | 1700 |
| Volume to Capacity | 0.33 | 0.00 | 0.16 |
| Queue Length 95th (ft) | 0 | 0 | 0 |
| Control Delay (s) | 0.0 | 8.6 | 0.0 |
| Lane LOS | | A | |
| Approach Delay (s) | 0.0 | 0.1 | |
| Approach LOS | | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | | 0.0 | |
| Intersection Capacity Utilization | | 30.9% | ICU Level of Service A |
| Analysis Period (min) | | 15 | |



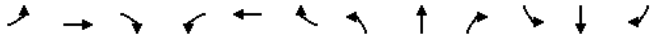
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Volume (veh/h) | 6 | 487 | 0 | 0 | 230 | 17 | 1 | 0 | 2 | 8 | 0 | 8 |
| Peak Hour Factor | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 |
| Hourly flow rate (vph) | 7 | 553 | 0 | 0 | 261 | 19 | 1 | 0 | 2 | 9 | 0 | 9 |
| Pedestrians | | | | | | | | 7 | | | 3 | |
| Lane Width (ft) | | | | | | | | 12.0 | | | 12.0 | |
| Walking Speed (ft/s) | | | | | | | | 4.0 | | | 4.0 | |
| Percent Blockage | | | | | | | | 1 | | | 0 | |
| Right turn flare (veh) | | | | | | | | | | | | |
| Median type | | | | | | | | TWLTL | | | TWLTL | |
| Median storage veh) | | | | | | | | 1 | | | 1 | |
| Upstream signal (ft) | | | | | | | | | | | | |
| pX, platoon unblocked | | | | | | | | | | | | |
| vC, conflicting volume | 284 | | | 560 | | | 854 | 858 | 560 | 843 | 848 | 274 |
| vC1, stage 1 conf vol | | | | | | | 574 | 574 | | 274 | 274 | |
| vC2, stage 2 conf vol | | | | | | | 280 | 284 | | 569 | 574 | |
| vCu, unblocked vol | 284 | | | 560 | | | 854 | 858 | 560 | 843 | 848 | 274 |
| tC, single (s) | 4.1 | | | 4.1 | | | 7.1 | 6.5 | 6.2 | 7.4 | 6.5 | 6.3 |
| tC, 2 stage (s) | | | | | | | 6.1 | 5.5 | | 6.4 | 5.5 | |
| tF (s) | 2.2 | | | 2.2 | | | 3.5 | 4.0 | 3.3 | 3.7 | 4.0 | 3.4 |
| p0 queue free % | 99 | | | 100 | | | 100 | 100 | 100 | 97 | 100 | 99 |
| cM capacity (veh/h) | 1287 | | | 1015 | | | 387 | 390 | 528 | 361 | 393 | 739 |

| Direction, Lane # | EB 1 | EB 2 | WB 1 | NB 1 | SB 1 |
|---|---|---|---|---|---|
| Volume Total | 7 | 553 | 281 | 3 | 18 |
| Volume Left | 7 | 0 | 0 | 1 | 9 |
| Volume Right | 0 | 0 | 19 | 2 | 9 |
| cSH | 1287 | 1700 | 1700 | 471 | 485 |
| Volume to Capacity | 0.01 | 0.33 | 0.17 | 0.01 | 0.04 |
| Queue Length 95th (ft) | 0 | 0 | 0 | 1 | 3 |
| Control Delay (s) | 7.8 | 0.0 | 0.0 | 12.7 | 12.7 |
| Lane LOS | A | | | B | B |
| Approach Delay (s) | 0.1 | | 0.0 | 12.7 | 12.7 |
| Approach LOS | | | | B | B |

| Intersection Summary | | | | |
|---|---|---|---|---|
| Average Delay | 0.4 | | | |
| Intersection Capacity Utilization | 37.1% | ICU Level of Service | A | |
| Analysis Period (min) | 15 | | | |







| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Volume (veh/h) | 0 | 492 | 5 | 2 | 244 | 2 | 1 | 1 | 2 | 22 | 0 | 2 |
| Peak Hour Factor | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 |
| Hourly flow rate (vph) | 0 | 559 | 6 | 2 | 277 | 2 | 1 | 1 | 2 | 25 | 0 | 2 |
| Pedestrians | | | | | | | | 9 | | | 2 | |
| Lane Width (ft) | | | | | | | | 12.0 | | | 12.0 | |
| Walking Speed (ft/s) | | | | | | | | 4.0 | | | 4.0 | |
| Percent Blockage | | | | | | | | 1 | | | 0 | |
| Right turn flare (veh) | | | | | | | | | | | | |
| Median type | | | | | | | | TWLTL | | | TWLTL | |
| Median storage veh) | | | | | | | | 1 | | | 1 | |
| Upstream signal (ft) | | | | | | | | | | | | |
| pX, platoon unblocked | | | | | | | | | | | | |
| vC, conflicting volume | 282 | | | 574 | | | 855 | 857 | 571 | 847 | 859 | 280 |
| vC1, stage 1 conf vol | | | | | | | 571 | 571 | | 285 | 285 | |
| vC2, stage 2 conf vol | | | | | | | 284 | 286 | | 562 | 574 | |
| vCu, unblocked vol | 282 | | | 574 | | | 855 | 857 | 571 | 847 | 859 | 280 |
| tC, single (s) | 4.1 | | | 4.1 | | | 7.1 | 6.5 | 6.2 | 7.6 | 6.5 | 6.2 |
| tC, 2 stage (s) | | | | | | | 6.1 | 5.5 | | 6.6 | 5.5 | |
| tF (s) | 2.2 | | | 2.2 | | | 3.5 | 4.0 | 3.3 | 4.0 | 4.0 | 3.3 |
| p0 queue free % | 100 | | | 100 | | | 100 | 100 | 100 | 92 | 100 | 100 |
| cM capacity (veh/h) | 1290 | | | 1002 | | | 390 | 392 | 520 | 332 | 390 | 762 |

| Direction, Lane # | EB 1 | EB 2 | WB 1 | WB 2 | NB 1 | SB 1 |
|---|---|---|---|---|---|---|
| Volume Total | 0 | 565 | 2 | 280 | 5 | 27 |
| Volume Left | 0 | 0 | 2 | 0 | 1 | 25 |
| Volume Right | 0 | 6 | 0 | 2 | 2 | 2 |
| cSH | 1700 | 1700 | 1002 | 1700 | 446 | 348 |
| Volume to Capacity | 0.00 | 0.33 | 0.00 | 0.16 | 0.01 | 0.08 |
| Queue Length 95th (ft) | 0 | 0 | 0 | 0 | 1 | 6 |
| Control Delay (s) | 0.0 | 0.0 | 8.6 | 0.0 | 13.1 | 16.2 |
| Lane LOS | | | A | | B | C |
| Approach Delay (s) | 0.0 | | 0.1 | | 13.1 | 16.2 |
| Approach LOS | | | | | B | C |

| Intersection Summary | | | | |
|---|---|---|---|---|
| Average Delay | 0.6 | | | |
| Intersection Capacity Utilization | 38.5% | ICU Level of Service | A | |
| Analysis Period (min) | 15 | | | |

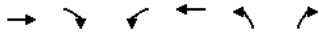
| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Sign Control | Free | | | Free | Stop | |
| Grade | 0% | | | 0% | 0% | |
| Volume (veh/h) | 417 | 7 | 10 | 655 | 2 | 10 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 453 | 8 | 11 | 712 | 2 | 11 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | | | TWLTL | |
| Median storage veh) | | | | | 1 | |
| Upstream signal (ft) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | | | 461 | | 1191 | 457 |
| vC1, stage 1 conf vol | | | | | 457 | |
| vC2, stage 2 conf vol | | | | | 734 | |
| vCu, unblocked vol | | | 461 | | 1191 | 457 |
| tC, single (s) | | | 4.1 | | 6.4 | 6.2 |
| tC, 2 stage (s) | | | | | 5.4 | |
| tF (s) | | | 2.2 | | 3.5 | 3.3 |
| p0 queue free % | | | 99 | | 99 | 98 |
| cM capacity (veh/h) | | | 1111 | | 340 | 608 |

| Direction, Lane # | EB 1 | WB 1 | WB 2 | NB 1 |
|---|---|---|---|---|
| Volume Total | 461 | 11 | 712 | 13 |
| Volume Left | 0 | 11 | 0 | 2 |
| Volume Right | 8 | 0 | 0 | 11 |
| cSH | 1700 | 1111 | 1700 | 537 |
| Volume to Capacity | 0.27 | 0.01 | 0.42 | 0.02 |
| Queue Length 95th (ft) | 0 | 1 | 0 | 2 |
| Control Delay (s) | 0.0 | 8.3 | 0.0 | 11.9 |
| Lane LOS | | A | | B |
| Approach Delay (s) | 0.0 | 0.1 | | 11.9 |
| Approach LOS | | | | B |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 0.2 | | |
| Intersection Capacity Utilization | 46.4% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |







| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Sign Control | Free | | | Free | Stop | |
| Grade | 0% | | | 0% | 0% | |
| Volume (veh/h) | 422 | 5 | 1 | 665 | 0 | 0 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 459 | 5 | 1 | 723 | 0 | 0 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | | | TWLTL | |
| Median storage veh) | | | | | 1 | |
| Upstream signal (ft) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | | | 464 | | 1186 | 461 |
| vC1, stage 1 conf vol | | | | | 461 | |
| vC2, stage 2 conf vol | | | | | 725 | |
| vCu, unblocked vol | | | 464 | | 1186 | 461 |
| tC, single (s) | | | 4.1 | | 6.4 | 6.2 |
| tC, 2 stage (s) | | | | | 5.4 | |
| tF (s) | | | 2.2 | | 3.5 | 3.3 |
| p0 queue free % | | | 100 | | 100 | 100 |
| cM capacity (veh/h) | | | 1108 | | 344 | 604 |

| Direction, Lane # | EB 1 | WB 1 | WB 2 |
|---|---|---|---|
| Volume Total | 464 | 1 | 723 |
| Volume Left | 0 | 1 | 0 |
| Volume Right | 5 | 0 | 0 |
| cSH | 1700 | 1108 | 1700 |
| Volume to Capacity | 0.27 | 0.00 | 0.43 |
| Queue Length 95th (ft) | 0 | 0 | 0 |
| Control Delay (s) | 0.0 | 8.3 | 0.0 |
| Lane LOS | | A | |
| Approach Delay (s) | 0.0 | 0.0 | |
| Approach LOS | | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 0.0 | | |
| Intersection Capacity Utilization | 46.9% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

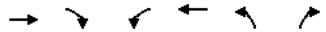
| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Sign Control | Free | | | Free | Stop | |
| Grade | 0% | | | 0% | 0% | |
| Volume (veh/h) | 422 | 0 | 0 | 665 | 1 | 0 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 459 | 0 | 0 | 723 | 1 | 0 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | | | TWLTL | |
| Median storage veh) | | | | | 1 | |
| Upstream signal (ft) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | | | 459 | | 1182 | 459 |
| vC1, stage 1 conf vol | | | | | 459 | |
| vC2, stage 2 conf vol | | | | | 723 | |
| vCu, unblocked vol | | | 459 | | 1182 | 459 |
| tC, single (s) | | | 4.1 | | 6.4 | 6.2 |
| tC, 2 stage (s) | | | | | 5.4 | |
| tF (s) | | | 2.2 | | 3.5 | 3.3 |
| p0 queue free % | | | 100 | | 100 | 100 |
| cM capacity (veh/h) | | | 1113 | | 345 | 606 |

| Direction, Lane # | EB 1 | WB 1 | NB 1 |
|---|---|---|---|
| Volume Total | 459 | 723 | 1 |
| Volume Left | 0 | 0 | 1 |
| Volume Right | 0 | 0 | 0 |
| cSH | 1700 | 1700 | 345 |
| Volume to Capacity | 0.27 | 0.43 | 0.00 |
| Queue Length 95th (ft) | 0 | 0 | 0 |
| Control Delay (s) | 0.0 | 0.0 | 15.5 |
| Lane LOS | | | C |
| Approach Delay (s) | 0.0 | 0.0 | 15.5 |
| Approach LOS | | | C |

| Intersection Summary | | | | |
|---|---|---|---|---|
| Average Delay | | 0.0 | | |
| Intersection Capacity Utilization | | 46.9% | ICU Level of Service | A |
| Analysis Period (min) | | 15 | | |



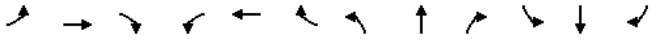




| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Sign Control | Free | | | Free | Stop | |
| Grade | 0% | | | 0% | 0% | |
| Volume (veh/h) | 422 | 0 | 1 | 665 | 0 | 0 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 459 | 0 | 1 | 723 | 0 | 0 |
| Pedestrians | | | | | 1 | |
| Lane Width (ft) | | | | | 0.0 | |
| Walking Speed (ft/s) | | | | | 4.0 | |
| Percent Blockage | | | | | 0 | |
| Right turn flare (veh) | | | | | | |
| Median type | | | | | TWLTL | |
| Median storage veh) | | | | | 1 | |
| Upstream signal (ft) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | | | 460 | | 1185 | 460 |
| vC1, stage 1 conf vol | | | | | 460 | |
| vC2, stage 2 conf vol | | | | | 725 | |
| vCu, unblocked vol | | | 460 | | 1185 | 460 |
| tC, single (s) | | | 4.1 | | 6.4 | 6.2 |
| tC, 2 stage (s) | | | | | 5.4 | |
| tF (s) | | | 2.2 | | 3.5 | 3.3 |
| p0 queue free % | | | 100 | | 100 | 100 |
| cM capacity (veh/h) | | | 1112 | | 344 | 606 |

| Direction, Lane # | EB 1 | WB 1 | WB 2 |
|---|---|---|---|
| Volume Total | 459 | 1 | 723 |
| Volume Left | 0 | 1 | 0 |
| Volume Right | 0 | 0 | 0 |
| cSH | 1700 | 1112 | 1700 |
| Volume to Capacity | 0.27 | 0.00 | 0.43 |
| Queue Length 95th (ft) | 0 | 0 | 0 |
| Control Delay (s) | 0.0 | 8.2 | 0.0 |
| Lane LOS | | A | |
| Approach Delay (s) | 0.0 | 0.0 | |
| Approach LOS | | | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| Average Delay | | 0.0 | | |
| Intersection Capacity Utilization | | 40.3% | ICU Level of Service | A |
| Analysis Period (min) | | 15 | | |



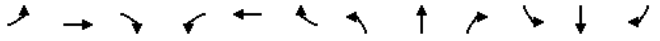
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Volume (veh/h) | 0 | 422 | 0 | 0 | 641 | 2 | 13 | 0 | 7 | 7 | 0 | 12 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 0 | 459 | 0 | 0 | 697 | 2 | 14 | 0 | 8 | 8 | 0 | 13 |
| Pedestrians | | | | | | | | 1 | | | 1 | |
| Lane Width (ft) | | | | | | | | 12.0 | | | 12.0 | |
| Walking Speed (ft/s) | | | | | | | | 4.0 | | | 4.0 | |
| Percent Blockage | | | | | | | | 0 | | | 0 | |
| Right turn flare (veh) | | | | | | | | | | | | |
| Median type | | | | | | | | TWLTL | | | TWLTL | |
| Median storage veh) | | | | | | | | 1 | | | 1 | |
| Upstream signal (ft) | | | | | | | | | | | | |
| pX, platoon unblocked | | | | | | | | | | | | |
| vC, conflicting volume | 700 | | | 460 | | | 1171 | 1160 | 460 | 1165 | 1159 | 699 |
| vC1, stage 1 conf vol | | | | | | | 460 | 460 | | 699 | 699 | |
| vC2, stage 2 conf vol | | | | | | | 711 | 700 | | 466 | 460 | |
| vCu, unblocked vol | 700 | | | 460 | | | 1171 | 1160 | 460 | 1165 | 1159 | 699 |
| tC, single (s) | 4.1 | | | 4.1 | | | 7.1 | 6.5 | 6.2 | 7.1 | 6.5 | 6.2 |
| tC, 2 stage (s) | | | | | | | 6.1 | 5.5 | | 6.1 | 5.5 | |
| tF (s) | 2.2 | | | 2.2 | | | 3.5 | 4.0 | 3.3 | 3.5 | 4.0 | 3.3 |
| p0 queue free % | 100 | | | 100 | | | 95 | 100 | 99 | 97 | 100 | 97 |
| cM capacity (veh/h) | 906 | | | 1111 | | | 294 | 315 | 605 | 301 | 316 | 443 |

| Direction, Lane # | EB 1 | EB 2 | WB 1 | NB 1 | SB 1 |
|---|---|---|---|---|---|
| Volume Total | 0 | 459 | 699 | 22 | 21 |
| Volume Left | 0 | 0 | 0 | 14 | 8 |
| Volume Right | 0 | 0 | 2 | 8 | 13 |
| cSH | 1700 | 1700 | 1700 | 358 | 377 |
| Volume to Capacity | 0.00 | 0.27 | 0.41 | 0.06 | 0.05 |
| Queue Length 95th (ft) | 0 | 0 | 0 | 5 | 4 |
| Control Delay (s) | 0.0 | 0.0 | 0.0 | 15.7 | 15.1 |
| Lane LOS | | | | C | C |
| Approach Delay (s) | 0.0 | | 0.0 | 15.7 | 15.1 |
| Approach LOS | | | | C | C |

| Intersection Summary | | | | |
|---|---|---|---|---|
| Average Delay | 0.5 | | | |
| Intersection Capacity Utilization | 45.7% | ICU Level of Service | A | |
| Analysis Period (min) | 15 | | | |







| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Volume (veh/h) | 0 | 433 | 3 | 2 | 635 | 3 | 7 | 0 | 2 | 3 | 0 | 1 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 0 | 471 | 3 | 2 | 690 | 3 | 8 | 0 | 2 | 3 | 0 | 1 |
| Pedestrians | | | | | | | | | | | 1 | |
| Lane Width (ft) | | | | | | | | | | | 12.0 | |
| Walking Speed (ft/s) | | | | | | | | | | | 4.0 | |
| Percent Blockage | | | | | | | | | | | 0 | |
| Right turn flare (veh) | | | | | | | | | | | | |
| Median type | | | | | | | | TWLTL | | | TWLTL | |
| Median storage veh) | | | | | | | | 1 | | | 1 | |
| Upstream signal (ft) | | | | | | | | | | | | |
| pX, platoon unblocked | | | | | | | | | | | | |
| vC, conflicting volume | 694 | | | 474 | | | 1168 | 1171 | 472 | 1170 | 1171 | 693 |
| vC1, stage 1 conf vol | | | | | | | 472 | 472 | | 697 | 697 | |
| vC2, stage 2 conf vol | | | | | | | 696 | 699 | | 473 | 474 | |
| vCu, unblocked vol | 694 | | | 474 | | | 1168 | 1171 | 472 | 1170 | 1171 | 693 |
| tC, single (s) | 4.1 | | | 4.1 | | | 7.1 | 6.5 | 6.2 | 7.4 | 6.5 | 7.2 |
| tC, 2 stage (s) | | | | | | | 6.1 | 5.5 | | 6.4 | 5.5 | |
| tF (s) | 2.2 | | | 2.2 | | | 3.5 | 4.0 | 3.3 | 3.8 | 4.0 | 4.2 |
| p0 queue free % | 100 | | | 100 | | | 97 | 100 | 100 | 99 | 100 | 100 |
| cM capacity (veh/h) | 910 | | | 1099 | | | 301 | 313 | 596 | 265 | 313 | 312 |

| Direction, Lane # | EB 1 | EB 2 | WB 1 | WB 2 | NB 1 | SB 1 |
|---|---|---|---|---|---|---|
| Volume Total | 0 | 474 | 2 | 693 | 10 | 4 |
| Volume Left | 0 | 0 | 2 | 0 | 8 | 3 |
| Volume Right | 0 | 3 | 0 | 3 | 2 | 1 |
| cSH | 1700 | 1700 | 1099 | 1700 | 339 | 276 |
| Volume to Capacity | 0.00 | 0.28 | 0.00 | 0.41 | 0.03 | 0.02 |
| Queue Length 95th (ft) | 0 | 0 | 0 | 0 | 2 | 1 |
| Control Delay (s) | 0.0 | 0.0 | 8.3 | 0.0 | 16.0 | 18.3 |
| Lane LOS | | | A | | C | C |
| Approach Delay (s) | 0.0 | | 0.0 | | 16.0 | 18.3 |
| Approach LOS | | | | | C | C |

| Intersection Summary | | | | |
|---|---|---|---|---|
| Average Delay | 0.2 | | | |
| Intersection Capacity Utilization | 45.5% | ICU Level of Service | A | |
| Analysis Period (min) | 15 | | | |

# HCM Analysis – Without Turn Lanes

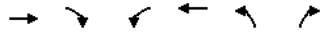
| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Sign Control | Free | | | Free | Stop | |
| Grade | 0% | | | 0% | 0% | |
| Volume (veh/h) | 512 | 7 | 2 | 233 | 7 | 9 |
| Peak Hour Factor | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 |
| Hourly flow rate (vph) | 582 | 8 | 2 | 265 | 8 | 10 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | | | None | |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | | | 590 | | 855 | 586 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | | | 590 | | 855 | 586 |
| tC, single (s) | | | 4.1 | | 6.4 | 6.2 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | | | 2.2 | | 3.5 | 3.3 |
| p0 queue free % | | | 100 | | 98 | 98 |
| cM capacity (veh/h) | | | 996 | | 330 | 514 |

| Direction, Lane # | EB 1 | WB 1 | NB 1 |
|---|---|---|---|
| Volume Total | 590 | 267 | 18 |
| Volume Left | 0 | 2 | 8 |
| Volume Right | 8 | 0 | 10 |
| cSH | 1700 | 996 | 414 |
| Volume to Capacity | 0.35 | 0.00 | 0.04 |
| Queue Length 95th (ft) | 0 | 0 | 3 |
| Control Delay (s) | 0.0 | 0.1 | 14.1 |
| Lane LOS | | A | B |
| Approach Delay (s) | 0.0 | 0.1 | 14.1 |
| Approach LOS | | | B |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | | 0.3 | |
| Intersection Capacity Utilization | | 38.9% | ICU Level of Service A |
| Analysis Period (min) | | 15 | |







| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Sign Control | Free | | | Free | Stop | |
| Grade | 0% | | | 0% | 0% | |
| Volume (veh/h) | 495 | 26 | 2 | 235 | 0 | 0 |
| Peak Hour Factor | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 |
| Hourly flow rate (vph) | 562 | 30 | 2 | 267 | 0 | 0 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | | | None | |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | | | 592 | | 849 | 577 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | | | 592 | | 849 | 577 |
| tC, single (s) | | | 4.1 | | 6.4 | 6.2 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | | | 2.2 | | 3.5 | 3.3 |
| p0 queue free % | | | 100 | | 100 | 100 |
| cM capacity (veh/h) | | | 994 | | 333 | 520 |

| Direction, Lane # | EB 1 | WB 1 |
|---|---|---|
| Volume Total | 592 | 269 |
| Volume Left | 0 | 2 |
| Volume Right | 30 | 0 |
| cSH | 1700 | 994 |
| Volume to Capacity | 0.35 | 0.00 |
| Queue Length 95th (ft) | 0 | 0 |
| Control Delay (s) | 0.0 | 0.1 |
| Lane LOS | | A |
| Approach Delay (s) | 0.0 | 0.1 |
| Approach LOS | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | | 0.0 | |
| Intersection Capacity Utilization | | 32.5% | ICU Level of Service A |
| Analysis Period (min) | | 15 | |

| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Sign Control | Free | | | Free | Stop | |
| Grade | 0% | | | 0% | 0% | |
| Volume (veh/h) | 495 | 0 | 0 | 237 | 0 | 0 |
| Peak Hour Factor | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 |
| Hourly flow rate (vph) | 562 | 0 | 0 | 269 | 0 | 0 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | | | None | |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | | | 562 | | 832 | 562 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | | | 562 | | 832 | 562 |
| tC, single (s) | | | 4.1 | | 6.4 | 6.2 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | | | 2.2 | | 3.5 | 3.3 |
| p0 queue free % | | | 100 | | 100 | 100 |
| cM capacity (veh/h) | | | 1019 | | 342 | 530 |

| Direction, Lane # | EB 1 | WB 1 | NB 1 |
|---|---|---|---|
| Volume Total | 562 | 269 | 0 |
| Volume Left | 0 | 0 | 0 |
| Volume Right | 0 | 0 | 0 |
| cSH | 1700 | 1700 | 1700 |
| Volume to Capacity | 0.33 | 0.16 | 0.00 |
| Queue Length 95th (ft) | 0 | 0 | 0 |
| Control Delay (s) | 0.0 | 0.0 | 0.0 |
| Lane LOS | | | A |
| Approach Delay (s) | 0.0 | 0.0 | 0.0 |
| Approach LOS | | | A |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | | 0.0 | |
| Intersection Capacity Utilization | | 30.8% | ICU Level of Service A |
| Analysis Period (min) | | 15 | |



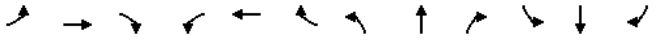


| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Sign Control | Free | | | Free | Stop | |
| Grade | 0% | | | 0% | 0% | |
| Volume (veh/h) | 493 | 2 | 2 | 237 | 0 | 0 |
| Peak Hour Factor | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 |
| Hourly flow rate (vph) | 560 | 2 | 2 | 269 | 0 | 0 |
| Pedestrians | | | | | 7 | |
| Lane Width (ft) | | | | | 0.0 | |
| Walking Speed (ft/s) | | | | | 4.0 | |
| Percent Blockage | | | | | 0 | |
| Right turn flare (veh) | | | | | | |
| Median type | | | | | None | |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | | | 570 | | 842 | 568 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | | | 570 | | 842 | 568 |
| tC, single (s) | | | 4.1 | | 6.4 | 6.2 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | | | 2.2 | | 3.5 | 3.3 |
| p0 queue free % | | | 100 | | 100 | 100 |
| cM capacity (veh/h) | | | 1013 | | 336 | 526 |

| Direction, Lane # | EB 1 | WB 1 |
|---|---|---|
| Volume Total | 562 | 272 |
| Volume Left | 0 | 2 |
| Volume Right | 2 | 0 |
| cSH | 1700 | 1013 |
| Volume to Capacity | 0.33 | 0.00 |
| Queue Length 95th (ft) | 0 | 0 |
| Control Delay (s) | 0.0 | 0.1 |
| Lane LOS | | A |
| Approach Delay (s) | 0.0 | 0.1 |
| Approach LOS | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | | 0.0 | |
| Intersection Capacity Utilization | | 30.9% | ICU Level of Service A |
| Analysis Period (min) | | 15 | |

HCM Unsignalized Intersection Capacity Analysis Supplemental Warner Milne Restriping Study
5: Warner Milne Rd & PGE (West)/Red Soils (Center) outbound Existing A.M. -- No Turn Lanes



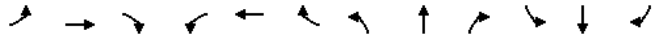
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | ↕ | | | ↕ | | | ↕ | | | ↕ | |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Volume (veh/h) | 6 | 487 | 0 | 0 | 230 | 17 | 1 | 0 | 2 | 8 | 0 | 8 |
| Peak Hour Factor | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 |
| Hourly flow rate (vph) | 7 | 553 | 0 | 0 | 261 | 19 | 1 | 0 | 2 | 9 | 0 | 9 |
| Pedestrians | | | | | | | | 7 | | | 3 | |
| Lane Width (ft) | | | | | | | | 12.0 | | | 12.0 | |
| Walking Speed (ft/s) | | | | | | | | 4.0 | | | 4.0 | |
| Percent Blockage | | | | | | | | 1 | | | 0 | |
| Right turn flare (veh) | | | | | | | | | | | | |
| Median type | | | | | | | | None | | | None | |
| Median storage veh) | | | | | | | | | | | | |
| Upstream signal (ft) | | | | | | | | | | | | |
| pX, platoon unblocked | | | | | | | | | | | | |
| vC, conflicting volume | 284 | | | 560 | | | 854 | 858 | 560 | 843 | 848 | 274 |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 284 | | | 560 | | | 854 | 858 | 560 | 843 | 848 | 274 |
| tC, single (s) | 4.1 | | | 4.1 | | | 7.1 | 6.5 | 6.2 | 7.4 | 6.5 | 6.3 |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 2.2 | | | 2.2 | | | 3.5 | 4.0 | 3.3 | 3.7 | 4.0 | 3.4 |
| p0 queue free % | 99 | | | 100 | | | 100 | 100 | 100 | 96 | 100 | 99 |
| cM capacity (veh/h) | 1287 | | | 1015 | | | 273 | 293 | 528 | 255 | 296 | 739 |

| Direction, Lane # | EB 1 | WB 1 | NB 1 | SB 1 |
|---|---|---|---|---|
| Volume Total | 560 | 281 | 3 | 18 |
| Volume Left | 7 | 0 | 1 | 9 |
| Volume Right | 0 | 19 | 2 | 9 |
| cSH | 1287 | 1015 | 403 | 379 |
| Volume to Capacity | 0.01 | 0.00 | 0.01 | 0.05 |
| Queue Length 95th (ft) | 0 | 0 | 1 | 4 |
| Control Delay (s) | 0.2 | 0.0 | 14.0 | 15.0 |
| Lane LOS | A | | B | B |
| Approach Delay (s) | 0.2 | 0.0 | 14.0 | 15.0 |
| Approach LOS | | | B | B |

| Intersection Summary | | | | |
|---|---|---|---|---|
| Average Delay | 0.5 | | | |
| Intersection Capacity Utilization | 42.1% | ICU Level of Service | A | |
| Analysis Period (min) | 15 | | | |



HCM Unsignalized Intersection Capacity Analysis Supplemental Warner Milne Restriping Study
6: Warner Milne Rd & PGE (East)/Red Soils (East) Existing A.M. -- No Turn Lanes



| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | ↕ | | | ↕ | | | ↕ | | | ↕ | |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Volume (veh/h) | 0 | 492 | 5 | 2 | 244 | 2 | 1 | 1 | 2 | 22 | 0 | 2 |
| Peak Hour Factor | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 |
| Hourly flow rate (vph) | 0 | 559 | 6 | 2 | 277 | 2 | 1 | 1 | 2 | 25 | 0 | 2 |
| Pedestrians | | | | | | | | 9 | | | 2 | |
| Lane Width (ft) | | | | | | | | 12.0 | | | 12.0 | |
| Walking Speed (ft/s) | | | | | | | | 4.0 | | | 4.0 | |
| Percent Blockage | | | | | | | | 1 | | | 0 | |
| Right turn flare (veh) | | | | | | | | | | | | |
| Median type | | | | | | | | None | | | None | |
| Median storage veh) | | | | | | | | | | | | |
| Upstream signal (ft) | | | | | | | | | | | | |
| pX, platoon unblocked | | | | | | | | | | | | |
| vC, conflicting volume | 282 | | | 574 | | | 856 | 857 | 571 | 850 | 859 | 280 |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 282 | | | 574 | | | 856 | 857 | 571 | 850 | 859 | 280 |
| tC, single (s) | 4.1 | | | 4.1 | | | 7.1 | 6.5 | 6.2 | 7.6 | 6.5 | 6.2 |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 2.2 | | | 2.2 | | | 3.5 | 4.0 | 3.3 | 4.0 | 4.0 | 3.3 |
| p0 queue free % | 100 | | | 100 | | | 100 | 100 | 100 | 89 | 100 | 100 |
| cM capacity (veh/h) | 1290 | | | 1002 | | | 275 | 294 | 520 | 229 | 293 | 762 |

| Direction, Lane # | EB 1 | WB 1 | NB 1 | SB 1 |
|---|---|---|---|---|
| Volume Total | 565 | 282 | 5 | 27 |
| Volume Left | 0 | 2 | 1 | 25 |
| Volume Right | 6 | 2 | 2 | 2 |
| cSH | 1290 | 1002 | 367 | 243 |
| Volume to Capacity | 0.00 | 0.00 | 0.01 | 0.11 |
| Queue Length 95th (ft) | 0 | 0 | 1 | 9 |
| Control Delay (s) | 0.0 | 0.1 | 14.9 | 21.7 |
| Lane LOS | | A | B | C |
| Approach Delay (s) | 0.0 | 0.1 | 14.9 | 21.7 |
| Approach LOS | | | B | C |

| Intersection Summary | | | | |
|---|---|---|---|---|
| Average Delay | 0.8 | | | |
| Intersection Capacity Utilization | 38.5% | ICU Level of Service | A | |
| Analysis Period (min) | 15 | | | |

| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Sign Control | Free | | | Free | Stop | |
| Grade | 0% | | | 0% | 0% | |
| Volume (veh/h) | 417 | 7 | 10 | 655 | 2 | 10 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 453 | 8 | 11 | 712 | 2 | 11 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | | | None | |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | | | 461 | | 1191 | 457 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | | | 461 | | 1191 | 457 |
| tC, single (s) | | | 4.1 | | 6.4 | 6.2 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | | | 2.2 | | 3.5 | 3.3 |
| p0 queue free % | | | 99 | | 99 | 98 |
| cM capacity (veh/h) | | | 1111 | | 207 | 608 |

| Direction, Lane # | EB 1 | WB 1 | NB 1 |
|---|---|---|---|
| Volume Total | 461 | 723 | 13 |
| Volume Left | 0 | 11 | 2 |
| Volume Right | 8 | 0 | 11 |
| cSH | 1700 | 1111 | 460 |
| Volume to Capacity | 0.27 | 0.01 | 0.03 |
| Queue Length 95th (ft) | 0 | 1 | 2 |
| Control Delay (s) | 0.0 | 0.3 | 13.1 |
| Lane LOS | | A | B |
| Approach Delay (s) | 0.0 | 0.3 | 13.1 |
| Approach LOS | | | B |

| Intersection Summary | | | | |
|---|---|---|---|---|
| Average Delay | | 0.3 | | |
| Intersection Capacity Utilization | | 54.8% | ICU Level of Service | A |
| Analysis Period (min) | | 15 | | |





| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Sign Control | Free | | | Free | Stop | |
| Grade | 0% | | | 0% | 0% | |
| Volume (veh/h) | 422 | 5 | 1 | 665 | 0 | 0 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 459 | 5 | 1 | 723 | 0 | 0 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | | | None | |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | | | 464 | | 1186 | 461 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | | | 464 | | 1186 | 461 |
| tC, single (s) | | | 4.1 | | 6.4 | 6.2 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | | | 2.2 | | 3.5 | 3.3 |
| p0 queue free % | | | 100 | | 100 | 100 |
| cM capacity (veh/h) | | | 1108 | | 210 | 604 |

| Direction, Lane # | EB 1 | WB 1 |
|---|---|---|
| Volume Total | 464 | 724 |
| Volume Left | 0 | 1 |
| Volume Right | 5 | 0 |
| cSH | 1700 | 1108 |
| Volume to Capacity | 0.27 | 0.00 |
| Queue Length 95th (ft) | 0 | 0 |
| Control Delay (s) | 0.0 | 0.0 |
| Lane LOS | | A |
| Approach Delay (s) | 0.0 | 0.0 |
| Approach LOS | | |

| Intersection Summary | | | | |
|---|---|---|---|---|
| Average Delay | | 0.0 | | |
| Intersection Capacity Utilization | | 41.1% | ICU Level of Service | A |
| Analysis Period (min) | | 15 | | |

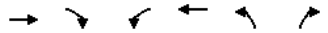
| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Sign Control | Free | | | Free | Stop | |
| Grade | 0% | | | 0% | 0% | |
| Volume (veh/h) | 422 | 0 | 0 | 665 | 1 | 0 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 459 | 0 | 0 | 723 | 1 | 0 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | | | None | |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | | | 459 | | 1182 | 459 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | | | 459 | | 1182 | 459 |
| tC, single (s) | | | 4.1 | | 6.4 | 6.2 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | | | 2.2 | | 3.5 | 3.3 |
| p0 queue free % | | | 100 | | 99 | 100 |
| cM capacity (veh/h) | | | 1113 | | 212 | 606 |

| Direction, Lane # | EB 1 | WB 1 | NB 1 |
|---|---|---|---|
| Volume Total | 459 | 723 | 1 |
| Volume Left | 0 | 0 | 1 |
| Volume Right | 0 | 0 | 0 |
| cSH | 1700 | 1700 | 212 |
| Volume to Capacity | 0.27 | 0.43 | 0.01 |
| Queue Length 95th (ft) | 0 | 0 | 0 |
| Control Delay (s) | 0.0 | 0.0 | 22.1 |
| Lane LOS | | | C |
| Approach Delay (s) | 0.0 | 0.0 | 22.1 |
| Approach LOS | | | C |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | | 0.0 | |
| Intersection Capacity Utilization | | 46.9% | ICU Level of Service A |
| Analysis Period (min) | | 15 | |



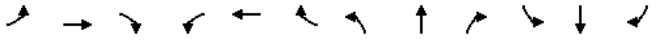




| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Sign Control | Free | | | Free | Stop | |
| Grade | 0% | | | 0% | 0% | |
| Volume (veh/h) | 422 | 0 | 1 | 665 | 0 | 0 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 459 | 0 | 1 | 723 | 0 | 0 |
| Pedestrians | | | | | 1 | |
| Lane Width (ft) | | | | | 0.0 | |
| Walking Speed (ft/s) | | | | | 4.0 | |
| Percent Blockage | | | | | 0 | |
| Right turn flare (veh) | | | | | | |
| Median type | | | | | None | |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | | | 460 | | 1185 | 460 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | | | 460 | | 1185 | 460 |
| tC, single (s) | | | 4.1 | | 6.4 | 6.2 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | | | 2.2 | | 3.5 | 3.3 |
| p0 queue free % | | | 100 | | 100 | 100 |
| cM capacity (veh/h) | | | 1112 | | 211 | 606 |

| Direction, Lane # | EB 1 | WB 1 |
|---|---|---|
| Volume Total | 459 | 724 |
| Volume Left | 0 | 1 |
| Volume Right | 0 | 0 |
| cSH | 1700 | 1112 |
| Volume to Capacity | 0.27 | 0.00 |
| Queue Length 95th (ft) | 0 | 0 |
| Control Delay (s) | 0.0 | 0.0 |
| Lane LOS | | A |
| Approach Delay (s) | 0.0 | 0.0 |
| Approach LOS | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | | 0.0 | |
| Intersection Capacity Utilization | | 41.1% | ICU Level of Service A |
| Analysis Period (min) | | 15 | |



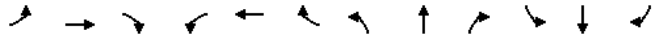
| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | ↕ | | | ↕ | | | ↕ | | | ↕ | |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Volume (veh/h) | 0 | 422 | 0 | 0 | 641 | 2 | 13 | 0 | 7 | 7 | 0 | 12 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 0 | 459 | 0 | 0 | 697 | 2 | 14 | 0 | 8 | 8 | 0 | 13 |
| Pedestrians | | | | | | | | 1 | | | 1 | |
| Lane Width (ft) | | | | | | | | 12.0 | | | 12.0 | |
| Walking Speed (ft/s) | | | | | | | | 4.0 | | | 4.0 | |
| Percent Blockage | | | | | | | | 0 | | | 0 | |
| Right turn flare (veh) | | | | | | | | | | | | |
| Median type | | | | | | | | None | | | None | |
| Median storage veh) | | | | | | | | | | | | |
| Upstream signal (ft) | | | | | | | | | | | | |
| pX, platoon unblocked | | | | | | | | | | | | |
| vC, conflicting volume | 700 | | | 460 | | | 1171 | 1160 | 460 | 1165 | 1159 | 699 |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 700 | | | 460 | | | 1171 | 1160 | 460 | 1165 | 1159 | 699 |
| tC, single (s) | 4.1 | | | 4.1 | | | 7.1 | 6.5 | 6.2 | 7.1 | 6.5 | 6.2 |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 2.2 | | | 2.2 | | | 3.5 | 4.0 | 3.3 | 3.5 | 4.0 | 3.3 |
| p0 queue free % | 100 | | | 100 | | | 91 | 100 | 99 | 96 | 100 | 97 |
| cM capacity (veh/h) | 906 | | | 1111 | | | 166 | 197 | 605 | 170 | 197 | 443 |

| Direction, Lane # | EB 1 | WB 1 | NB 1 | SB 1 |
|---|---|---|---|---|
| Volume Total | 459 | 699 | 22 | 21 |
| Volume Left | 0 | 0 | 14 | 8 |
| Volume Right | 0 | 2 | 8 | 13 |
| cSH | 906 | 1111 | 222 | 278 |
| Volume to Capacity | 0.00 | 0.00 | 0.10 | 0.07 |
| Queue Length 95th (ft) | 0 | 0 | 8 | 6 |
| Control Delay (s) | 0.0 | 0.0 | 22.9 | 19.0 |
| Lane LOS | | | C | C |
| Approach Delay (s) | 0.0 | 0.0 | 22.9 | 19.0 |
| Approach LOS | | | C | C |

| Intersection Summary | | | | |
|---|---|---|---|---|
| Average Delay | 0.7 | | | |
| Intersection Capacity Utilization | 45.7% | ICU Level of Service | A | |
| Analysis Period (min) | 15 | | | |







| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | ↕ | | | ↕ | | | ↕ | | | ↕ | |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Volume (veh/h) | 0 | 433 | 3 | 2 | 635 | 3 | 7 | 0 | 2 | 3 | 0 | 1 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 0 | 471 | 3 | 2 | 690 | 3 | 8 | 0 | 2 | 3 | 0 | 1 |
| Pedestrians | | | | | | | | | | | 1 | |
| Lane Width (ft) | | | | | | | | | | | 12.0 | |
| Walking Speed (ft/s) | | | | | | | | | | | 4.0 | |
| Percent Blockage | | | | | | | | | | | 0 | |
| Right turn flare (veh) | | | | | | | | | | | | |
| Median type | | | | | | | | None | | | None | |
| Median storage veh) | | | | | | | | | | | | |
| Upstream signal (ft) | | | | | | | | | | | | |
| pX, platoon unblocked | | | | | | | | | | | | |
| vC, conflicting volume | 694 | | | 474 | | | 1170 | 1171 | 472 | 1172 | 1171 | 693 |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 694 | | | 474 | | | 1170 | 1171 | 472 | 1172 | 1171 | 693 |
| tC, single (s) | 4.1 | | | 4.1 | | | 7.1 | 6.5 | 6.2 | 7.4 | 6.5 | 7.2 |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 2.2 | | | 2.2 | | | 3.5 | 4.0 | 3.3 | 3.8 | 4.0 | 4.2 |
| p0 queue free % | 100 | | | 100 | | | 96 | 100 | 100 | 98 | 100 | 100 |
| cM capacity (veh/h) | 910 | | | 1099 | | | 171 | 194 | 596 | 146 | 194 | 312 |

| Direction, Lane # | EB 1 | WB 1 | NB 1 | SB 1 |
|---|---|---|---|---|
| Volume Total | 474 | 696 | 10 | 4 |
| Volume Left | 0 | 2 | 8 | 3 |
| Volume Right | 3 | 3 | 2 | 1 |
| cSH | 910 | 1099 | 203 | 169 |
| Volume to Capacity | 0.00 | 0.00 | 0.05 | 0.03 |
| Queue Length 95th (ft) | 0 | 0 | 4 | 2 |
| Control Delay (s) | 0.0 | 0.1 | 23.7 | 26.9 |
| Lane LOS | | A | C | D |
| Approach Delay (s) | 0.0 | 0.1 | 23.7 | 26.9 |
| Approach LOS | | | C | D |

| Intersection Summary | | | | |
|---|---|---|---|---|
| Average Delay | 0.3 | | | |
| Intersection Capacity Utilization | 47.1% | ICU Level of Service | A | |
| Analysis Period (min) | 15 | | | |

# Turn Lane Warrants

# Left Turn Lane Warrant Analysis

## Project: Oregon City Warner Milne Restriping Study (Linn Ave to Beavercreek Rd)

### A.M. Peak Hour

| Intersection | Approach (NB,SB, EB,WB) | Number of Advancing Lanes | Number of Opposing Lanes | Volume Advancing (Va) | LT Vol | LT % | Volume Opposing (Vo) | Warrant Factor | 5% Warrant Va | Va Warrant Threshold | HRB Warrant Met? | ODOT Volume | ODOT Criteria Met? |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Hilltop Ct -- Warner Milne Rd | WB | 1 | 1 | 235 | 2 | 1% | 519 | 2.37 | 446 | 1059 | No | 754 | Consider |
| Red Soils (W) inbound -- Warner Milne Rd | WB | 1 | 1 | 237 | 2 | 1% | 521 | 2.38 | 444 | 1057 | No | 758 | Consider |
| Red Soils (C) inbound -- Warner Milne Rd | WB | 1 | 1 | 239 | 2 | 1% | 495 | 2.39 | 456 | 1092 | No | 734 | No |
| PGE (W)/Red Soils (C) outbound -- Warner Milne Rd | EB | 1 | 1 | 493 | 6 | 1% | 247 | 1.99 | 605 | 1202 | No | 740 | No |
| PGE (E)/Red Soils (E) -- Warner Milne Rd | EB | 1 | 1 | 497 | 0 | 0% | 246 | N/A | 605 | N/A | N/A | 743 | No |
| PGE (E)/Red Soils (E) -- Warner Milne Rd | WB | 1 | 1 | 248 | 2 | 1% | 497 | 2.44 | 456 | 1112 | No | 745 | No |

### P.M. Peak Hour

| Intersection | Approach (NB,SB, EB,WB) | Number of Advancing Lanes | Number of Opposing Lanes | Volume Advancing (Va) | LT Vol | LT % | Volume Opposing (Vo) | Warrant Factor | 5% Warrant Va | Va Warrant Threshold | HRB Warrant Met? | ODOT Volume | ODOT Criteria Met? |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Hilltop Ct -- Warner Milne Rd | WB | 1 | 1 | 665 | 10 | 2% | 424 | 1.79 | 496 | 889 | No | 1089 | Consider |
| Red Soils (W) inbound -- Warner Milne Rd | WB | 1 | 1 | 666 | 1 | 0% | 427 | 5.63 | 494 | 2779 | No | 1093 | Consider |
| Red Soils (C) inbound -- Warner Milne Rd | WB | 1 | 1 | 666 | 1 | 0% | 422 | 5.63 | 496 | 2794 | No | 1088 | Consider |
| PGE (W)/Red Soils (C) outbound -- Warner Milne Rd | EB | 1 | 1 | 422 | 0 | 0% | 643 | N/A | 390 | N/A | N/A | 1065 | No |
| PGE (E)/Red Soils (E) -- Warner Milne Rd | EB | 1 | 1 | 436 | 0 | 0% | 638 | N/A | 392 | N/A | N/A | 1074 | No |
| PGE (E)/Red Soils (E) -- Warner Milne Rd | WB | 1 | 1 | 640 | 2 | 0% | 436 | 3.90 | 488 | 1906 | No | 1076 | Consider |

ODOT LEFT TURN CRITERIA IS BASED ON THE **8-13-03** LEFT TURN CRITERIA