# Traffic Impact Study for the Chevron Remodel Project



Prepared for the Town of Windsor

Submitted by
**W-Trans**

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TRAFFIC ENGINEERING
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# Executive Summary

The Chevron remodel project would update the existing fuel station with a convenience store and carwash to include a larger, 6,270-square foot convenience store, an additional 3,860-square feet of retail space, two additional fueling positions and two electrical vehicle charging stations. The project would be expected to generate a total of 5,252 trips per day at the driveways, including 521 during the morning peak hour and 434 during the evening peak hour. After deducting trips associated with the existing uses and accounting for trips drawn from traffic passing the site anyway, the project is expected to generate an average of 1,540 net new trips daily, with 145 of these occurring during the morning peak hour and 131 during the evening peak hour.

Three intersections connecting the site to US 101 were evaluated as the locations most likely to experience a significant traffic impact. These three intersections all have an operational standard of LOS E, and the analysis indicates that they are all currently operating acceptably and are expected to continue doing so under future volumes and with project trips added, indicating a less-than-significant impact on traffic operation. The project results in increases to the projected queue lengths in the southbound Old Redwood Highway left-turn pocket to continue southeast on Old Redwood Highway and, during the morning peak under future volumes only, in the right-turn lane from eastbound Old Redwood Highway to the US 101 South on-ramp. While the impact is not significant for the southbound approach due to the shared use of the right lane (left-turn/through/right-turn), the queue for the right-turn to the US 101 on-ramp would exceed the length of the block between the ramp and Conde Lane. As there are no feasible means of addressing this queue length, it is suggested that the Town Engineer grant an exemption to a finding of significance.

The frequency of collisions at the three intersections was also reviewed, and it was determined that only Old Redwood Highway/US 101 North-Lakewood Drive had a collision rate that exceeds the Statewide average for similar facilities. The predominant type of crash at this location was rear-end collisions, which is typical for locations that experience congestion, such as is routine at this site. Caltrans owns and operates this intersection, and may wish to review their timing to determine if some changes are warranted.

The project site has adequate access for travel by alternative modes, and is located at one terminus of a proposed pathway over US 101 that would serve both pedestrians and bicyclists. Vehicular access and circulation were also reviewed, and are adequate as proposed. It is recommended that modifications to the site's driveway be designed to be consistent with the planned improvements associated with the bicycle-pedestrian promenade and to maintain full access to the existing Shell station.

The proposed parking supply of 55 spaces is less than the 66 spaces required under the Town's zoning code, but more than the 50 parking spaces estimated to be the peak demand based on standard parking rates. The Town may wish to consider a parking variance to accept the parking as proposed. The project should also provide at least 13 bicycle parking spaces.

# Introduction

This report presents an analysis of the potential traffic impacts that would be associated with the redevelopment of the existing Chevron service station located at 9120 Old Redwood Highway and the adjacent vacant parcel located at 9200 Old Redwood Highway in the Town of Windsor. The traffic study was completed in accordance with the criteria established by the Town of Windsor, is consistent with standard traffic engineering techniques, and reflects a scope of work reviewed and approved by Town staff. Caltrans had commented on the project prior to initiating the analysis, so the scope of work also reflects the analysis requested by Caltrans. Further, the Caltrans letter and a response-to-comments letter are provided in Appendix A.

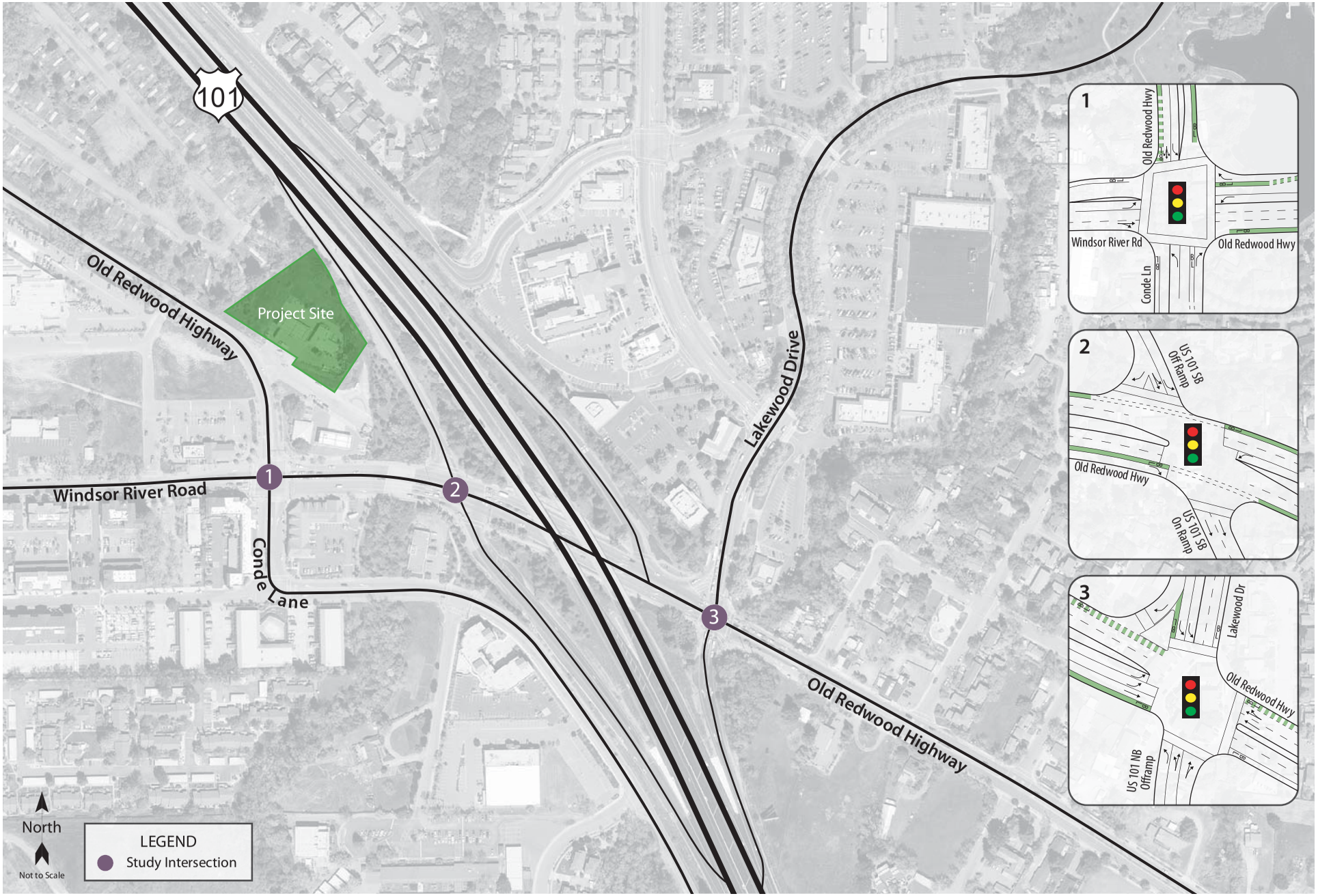
## Prelude

The purpose of a traffic impact study is to provide Town staff and policy makers with data that they can use to make an informed decision regarding the potential traffic impacts of a proposed project, and any associated improvements that would be required to mitigate these impacts to a level of insignificance as defined by the Town's General Plan or other policies. Vehicular traffic impacts are typically evaluated by determining the number of new trips that the proposed use would be expected to generate, distributing these trips to the surrounding street system based on existing travel patterns or anticipated travel patterns specific to the proposed project, then analyzing the impact the new traffic would be expected to have on critical intersections or roadway segments. Impacts relative to access for pedestrians, bicyclists, and to transit are also addressed.

## Project Profile

The project applicant seeks to redevelop the existing Chevron service station at 9120 Old Redwood Highway and the adjacent vacant parcel located at 9200 Old Redwood Highway. The existing convenience store and car wash are to be demolished and the six existing fuel pumps, canopy, and underground piping are to remain. The proposed redevelopment includes a 6,270-square foot convenience store and restaurant, a 3,860-square foot retail storefront to house one or two tenants, a 2,314-square foot (85-foot long) tunnel car wash with ten self-service vacuum stations, two additional fuel dispensers, and two electrical vehicle (EV) charging stations. The project would provide 55 vehicle parking spaces. Bicycle parking is to be provided via a bike rack located at the north side of the retail store.

The location of the project site is shown in Figure 1.




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Traffic Impact Study for the Chevron Remodel Project

**Figure 1 – Study Area and Lane Configurations**

# Transportation Setting

## Operational Analysis

### Study Area and Periods

The study area consists of the section of Old Redwood Highway fronting the project site and the project access point as well as the following intersections:

1. Old Redwood Highway-Conde Lane/Windsor River Road
2. Old Redwood Highway/US 101 South Ramps
3. Old Redwood Highway/US 101 North Off-ramp-Lakewood Drive

Operating conditions during the a.m. and p.m. peak periods were evaluated to capture the highest potential impacts for the proposed project as well as the highest volumes on the local transportation network. The morning peak hour occurs between 7:00 and 9:00 a.m. and reflects conditions during the home to work or school commute, while the p.m. peak hour occurs between 4:00 and 6:00 p.m. and typically reflects the highest level of congestion during the homeward bound commute.

### Study Intersections

The roadways in the study area are generally skewed at an angle from northwest to southeast. To maintain continuity with the north-south direction of US 101, Old Redwood Highway is treated as an east-west street through most of the study area.

**Old Redwood Highway-Conde Lane/Windsor River Road** is a four-legged signalized intersection with protected left-turn phasing on the eastbound Windsor River Road and westbound Old Redwood Highway approaches and split phasing for the southbound Old Redwood Highway and northbound Conde Lane approaches. It is noted that for analysis purposes, Old Redwood Highway changes alignment at this intersection from north-south to east-west. Right-turn overlap phasing exists on the westbound and northbound approaches and crosswalks are marked on all legs.

**Old Redwood Highway/US 101 South Ramps** is a signalized four-way intersection with protected left-turn phasing on the westbound Old Redwood Highway approach. The north leg is an off-ramp for vehicles exiting southbound US 101 and the south leg is an on-ramp for vehicles entering southbound US 101. The north and south legs include marked crosswalks.

**Old Redwood Highway/US 101 North Off-ramp-Lakewood Drive** is a four-legged intersection with protected left-turn phasing on the eastbound Old Redwood Highway approach and split phasing for the southbound Lakewood Drive and northbound US 101 off-ramp approaches. The southbound Lakewood Drive approach has a right-turn overlap phase.

The locations of the study intersections and the existing lane configurations and controls are shown in Figure 1.

### Study Roadway

**Old Redwood Highway** traverses the Town of Windsor and serves as one of its main streets through the Downtown area. While generally retaining its two-lane character, it expands to five lanes between Hembree Lane and Windsor River Road. At the Downtown interchange, Old Redwood Highway carries approximately 28,050 vehicles per day.

## Collision History

The collision history for the study area was reviewed to determine any trends or patterns that may indicate a safety issue. Collision rates were calculated based on records available from the California Highway Patrol as published in their Statewide Integrated Traffic Records System (SWITRS) reports. The most current five-year period available is September 1, 2012 through August 31, 2017.

As presented in Table 1, the calculated collision rates for the study intersections were compared to average collision rates for similar facilities statewide, as indicated in *2013 Collision Data on California State Highways*, California Department of Transportation (Caltrans). The calculated collision rates for the study intersections of Old Redwood Highway-Conde Lane/Windsor River Road and Old Redwood Highway/US 101 SB Ramps are lower than the statewide average for similar facilities, indicating that these are operating within acceptable safety parameters. The collision rate calculations are provided in Appendix B.

**Table 1 – Collision Rates at the Study Intersections**

| Study Intersection | Number of Collisions (2012-2017) | Calculated Collision Rate (c/mve) | Statewide Average Collision Rate (c/mve) |
|---|---|---|---|
| 1. ORH-Conde Ln/Windsor River Rd | 12 | 0.25 | 0.27 |
| 2. ORH/US 101 SB Ramps | 6 | 0.12 | 0.43 |
| 3. ORH/US 101 NB Off-ramp-Lakewood Dr | 27 | **0.37** | 0.27 |

Note: c/mve = collisions per million vehicles entering; ORH = Old Redwood Highway; **bold** text = collision rate is higher than the Statewide average

Old Redwood Highway/US 101 NB Off-ramp-Lakewood Drive has experienced collisions at a higher rate than the statewide average for similar facilities and 48.1 percent of crashes resulted in injuries, which is higher than the statewide average injury rate of 41.9 percent. The most notable trend was rear-end collisions, which are associated with congestion at the intersection. The Town installed a second left-turn lane on Lakewood Drive that provided additional capacity and reduced congestion, but clearance intervals should be reviewed by Town staff to ensure that they are adequate given the slightly skewed alignment of the intersection.

## Alternative Modes

### Pedestrian Facilities

Pedestrian facilities include sidewalks, crosswalks, pedestrian signal phases, curb ramps, curb extensions, and various streetscape amenities such as lighting, benches, etc. A connected network of sidewalks, crosswalks, pedestrian signals, and curb ramps provide access for pedestrians near the proposed project site.

- **Old Redwood Highway** – Full sidewalk coverage is provided on the east side of Old Redwood Highway along the project frontage with curb ramps and crosswalks existing at most side street approaches. The nearby intersection of Old Redwood Highway-Conde Lane/Windsor River Road has marked crosswalks and pedestrian phasing on all approaches. Lighting is provided by overhead street lights.

- **Windsor River Road** – Continuous sidewalks are provided on both sides of Windsor River Road between Windsor Road and Old Redwood Highway. Crosswalks are marked at side street intersections and overhead street lights exist on both sides of Windsor River Road.

- **Conde Lane** – The project site is generally well-connected to the area south via existing pedestrian facilities on Conde Lane. Sidewalks and street lights exist on both sides of Conde Lane from its intersection with Windsor River Road to Armando Renzullo Way.

The Town is currently reviewing options for expanding pedestrian connectivity by installing a connection either over or under US 101; this connection would have its westerly landing near the project site.

## Bicycle Facilities

The *Highway Design Manual*, Caltrans, 2017, classifies bikeways into four categories:

- **Class I Multi-Use Path** – a completely separated right-of-way for the exclusive use of bicycles and pedestrians with cross flows of motorized traffic minimized.
- **Class II Bike Lane** – a striped and signed lane for one-way bike travel on a street or highway.
- **Class III Bike Route** – signing only for shared use with motor vehicles within the same travel lane on a street or highway.
- **Class IV Bikeway** – also known as a separated bikeway, a Class IV Bikeway is for the exclusive use of bicycles and includes a separation between the bikeway and the motor vehicle traffic lane. The separation may include, but is not limited to, grade separation, flexible posts, inflexible physical barriers, or on-street parking.

In the project area, bike lanes exist on Conde Lane, Old Redwood Highway, and Windsor River Road. Bicyclists ride in the roadway and/or on sidewalks along all other streets within the project study area. Table 2 summarizes the existing and planned bicycle facilities in the project vicinity, as contained in the Town of Windsor *Bicycle and Pedestrian Master Plan*, 2014.

**Table 2 – Bicycle Facility Summary**

| Status<br>Facility | Class | Length (miles) | Begin Point | End Point |
|---|---|---|---|---|
| **Existing** | | | | |
| Conde Lane | II | 0.30 | Old Redwood Highway | Oakfield Lane |
| Old Redwood Highway | II | 1.50 | North Town Limit | Conde Lane |
| Old Redwood Highway | II | 2.35 | Conde Lane | South Town Limits |
| Windsor River Road | III | 1.32 | West Town Limit | Old Redwood Highway |
| **Planned** | | | | |
| Windsor Creek Trail | I | 0.48 | Windsor River Road | SMART Trail |
| Conde Lane | II | 1.00 | Oakfield Lane | Mitchell Lane |
| Lakewood Drive | II | 0.68 | Old Redwood Highway | Lakewood/Foothill Trail |

Source: *Town of Windsor Bicycle and Pedestrian Master Plan*, 2014

## Transit Facilities

### *Sonoma County Transit (SCT)*

Transit service in the Town of Windsor, and throughout Sonoma County, are provided by Sonoma County Transit (SCT). There are three SCT transit stops within what is typically considered an acceptable walking distance (one-quarter mile) of the site. SCT Route 66 provides loop service to destinations throughout the Town and stops on the west side of Old Redwood Highway, just south of the project site. This route operates on weekdays with

approximately 45-minute headways between 8:00 a.m. and 5:00 p.m. Weekend service operates with approximately one-hour headways between 9:30 a.m. and 3:30 p.m.

Route 60 provides regional service to destinations from Santa Rosa to Cloverdale and has stops located on both sides of Windsor River Road, just west of the intersection with Old Redwood Highway-Conde Lane. Route 60 operates seven days a week with approximately one-hour headways on weekdays between 6:00 a.m. and 10:00 p.m. and approximately one-and-a-half-hour headways on weekends from 7:30 a.m. to 10:00 p.m.

Two to three bicycles can be carried on most SCT buses. Bike rack space is on a first-come, first-served basis. Additional bicycles are allowed on SCT buses at the discretion of the driver.

Dial-a-ride, also known as paratransit, or door-to-door service, is available for those who are unable to independently use the transit system due to a physical or mental disability. SCT Paratransit is designed to serve the needs of individuals with disabilities within Sonoma and the greater County of Sonoma area.

### *Sonoma-Marin Area Rail Transit (SMART)*

The SMART commuter rail system currently includes 43 miles of rail corridor and 10 stations from the Sonoma County Airport to Downtown San Rafael. Upon completion, the passenger rail service will extend 70 miles from Cloverdale, at the north end of Sonoma County, to Larkspur where the Golden Gate Ferry connects Marin County with San Francisco. A future phase of the project will extend the rail line to Windsor's station at Windsor River Road and Windsor Road, approximately one-half mile from the project site. The SMART project is also intended to provide a critical north-south transportation route for bicyclists and pedestrians, with a combination of multi-use pathways and on-street facilities located along or adjacent to the right-of-way, though many segments of the pathway also remain unfunded.

# Capacity Analysis

## Intersection Level of Service Methodologies

Level of Service (LOS) is used to rank traffic operation on various types of facilities based on traffic volumes and roadway capacity using a series of letter designations ranging from A to F. Generally, Level of Service A represents free flow conditions and Level of Service F represents forced flow or breakdown conditions. A unit of measure that indicates a level of delay generally accompanies the LOS designation.

The study intersections were analyzed using the signalized methodology published in the *Highway Capacity Manual* (HCM), Transportation Research Board, 2010. This source contains methodologies for various types of intersection control, all of which are related to a measurement of delay in average number of seconds per vehicle. The applied methodology is based on factors including traffic volumes, green time for each movement, phasing, whether or not the signals are coordinated, truck traffic, and pedestrian activity. Average stopped delay per vehicle in seconds is used as the basis for evaluation in this LOS methodology. For purposes of this study, delays were calculated using actual signal timing from Caltrans timing sheets provided by the Town.

The ranges of delay associated with the various levels of service are indicated in Table 3.

| Table 3 – Signalized Intersection Level of Service Criteria | |
|---|---|
| LOS A | Delay of 0 to 10 seconds. Most vehicles arrive during the green phase, so do not stop at all. |
| LOS B | Delay of 10 to 20 seconds. More vehicles stop than with LOS A, but many drivers still do not have to stop. |
| LOS C | Delay of 20 to 35 seconds. The number of vehicles stopping is significant, although many still pass through without stopping. |
| LOS D | Delay of 35 to 55 seconds. The influence of congestion is noticeable, and most vehicles have to stop. |
| LOS E | Delay of 55 to 80 seconds. Most, if not all, vehicles must stop and drivers consider the delay excessive. |
| LOS F | Delay of more than 80 seconds. Vehicles may wait through more than one cycle to clear the intersection. |

Reference: *Highway Capacity Manual*, Transportation Research Board, 2010

## Traffic Operation Standards

The *Town of Windsor 2040 General Plan: Revised Public Review Draft*, October 2017, contains the following policies applicable to the traffic impact study. The 2040 General Plan and associated EIR have been forwarded to the Town Council by the Planning Commission for final approval, which is expected to occur soon.

> **Policy M-3.16 – Level of Service Application.** The Town shall maintain level of service standards that define the minimum acceptable operating characteristics for intersections and streets. A level of service D (LOS D) is defined as the minimum acceptable level of congestion during the weekday morning and evening peak periods for high-volume facilities such as freeways, crosstown streets, and signalized or all-way stop-controlled intersections. This standard should apply at all these locations except the following intersections, which are regional gateways to the Town's commercial and civic areas, and where a Level of Service E is tolerated by the Town and considered acceptable:
>
> - Old Redwood Highway/US 101 Northbound off ramp/Lakewood Drive
> - Old Redwood Highway/US 101 Southbound ramps
> - Old Redwood Highway/Conde Lane/Windsor River Road

If an intersection is operating at LOS E or F without project-generated traffic added, the project's impact shall be considered less-than-significant if it does not cause operation to fall from LOS E to LOS F and it increases average delay for the intersection as a whole by 5 seconds or less.

**Policy M-3.17 – Queuing.** Intersection queuing shall be evaluated in tandem with LOS. Projected 95th percentile queues at signalized intersections shall not extend through upstream signalized intersections. A queuing impact shall be considered significant if:

a. The 95th percentile queue length can be contained within the available stacking length without the project, and the project causes the queue to exceed the stacking length; or.

b. The queue length exceeds the available stacking length without the project and the project increases the 95th percentile queue by more than 10 feet, or approximately one-half a car-length. Exceptions to this policy may be granted by the Town Engineer, where there is insufficient block length to accommodate projected queuing or physical constraints that make it infeasible to construct the improvement that would be necessary to achieve adequate stacking length, such as geometrics, a lack of right-of-way, adjacent slopes or hills, and soil conditions.

## Existing Conditions

The Existing Conditions scenario provides an evaluation of current operation based on existing traffic volumes during the a.m. and p.m. peak periods. This condition does not include project-generated traffic volumes. Volume data was collected on December 5, 2017 while local schools were in session.

### Intersection Levels of Service

Under existing conditions, the study intersections operate acceptably at LOS D or better during both peak periods. The existing traffic volumes are shown in Figure 2. A summary of the intersection level of service calculations is contained in Table 4, and copies of the Level of Service calculations are provided in Appendix C.

**Table 4 – Existing Peak Hour Intersection Levels of Service**

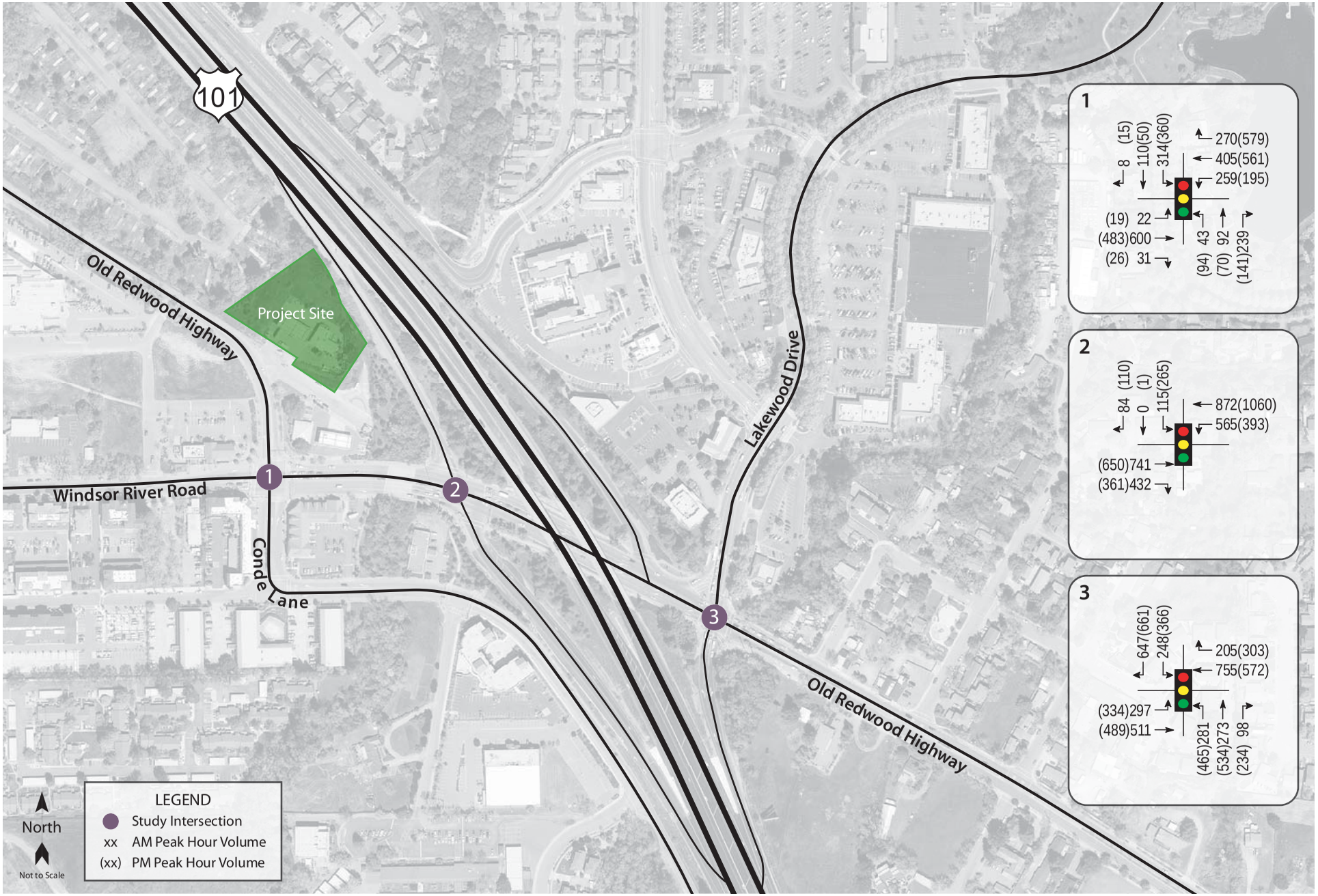
| Study Intersection | AM Peak | | PM Peak | |
|---|---|---|---|---|
| | Delay | LOS | Delay | LOS |
| 1. ORH-Conde Ln/Windsor River Rd | 29.5 | C | 23.0 | C |
| 2. ORH/US 101 SB Ramps | 23.2 | C | 20.4 | C |
| 3. ORH/US 101 NB Off-ramp-Lakewood Dr | 54.4 | D | 54.5 | D |

Notes: Delay is measured in average seconds per vehicle; LOS = Level of Service; ORH = Old Redwood Highway

## Future Conditions

Turning movement volumes for the horizon year of 2040 were obtained from the analysis performed for the EIR supporting the update to the Town's General Plan. The completion of the Arata Interchange to include a northbound on-ramp is included in the Town's Traffic Impact Mitigation Fee Program and was assumed in the modeling performed to project future volumes.

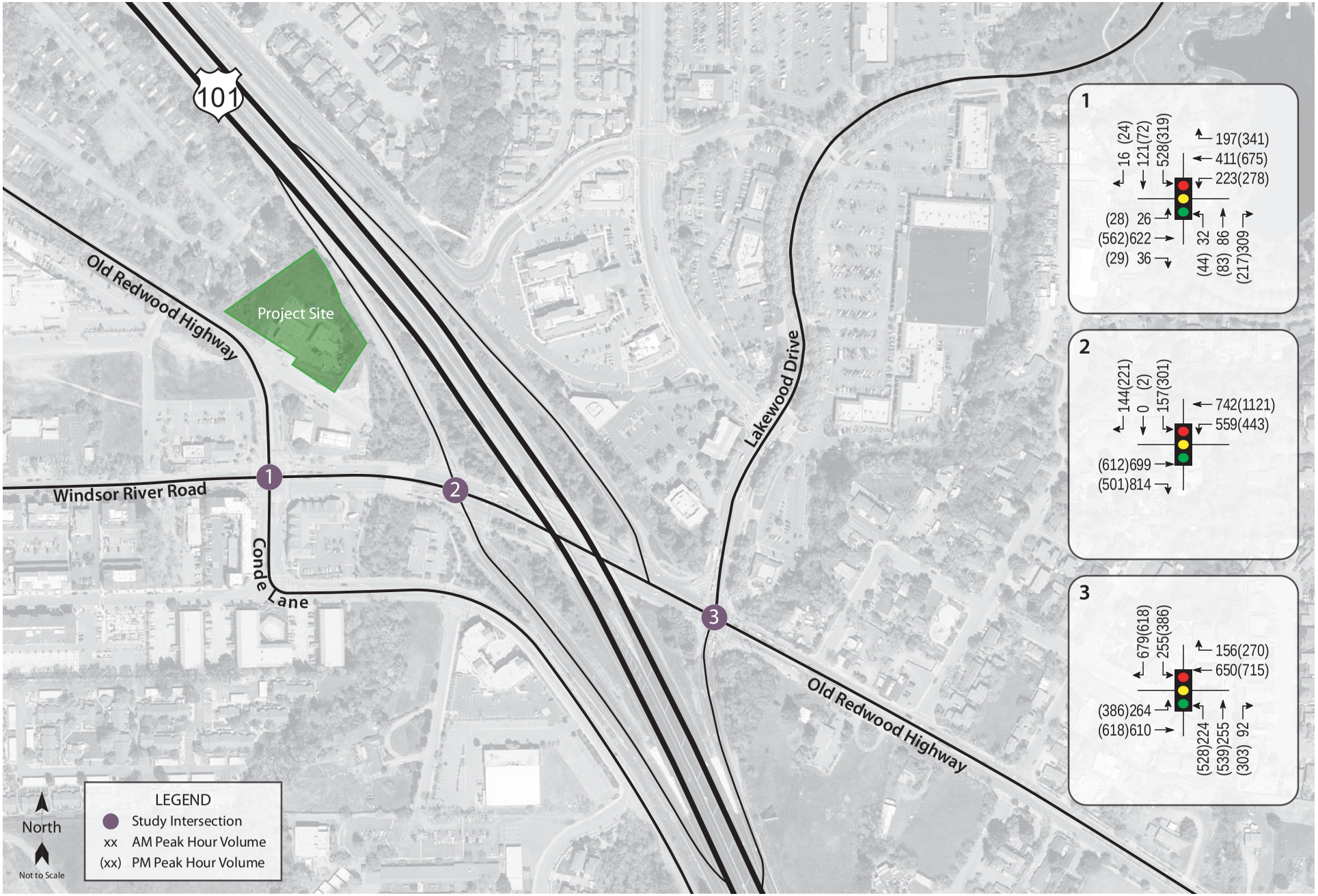
Under these anticipated Future volumes, and with the addition of the planned improvements, the study intersections are expected to operate acceptably at LOS E or better. Future volumes are shown in Figure 3 and operating conditions are summarized in Table 5.




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**Figure 2 – Existing Traffic Volumes**




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**Figure 3 – Future Traffic Volumes**

| Table 5 – Future Peak Hour Intersection Levels of Service | | | | |
|---|---|---|---|---|
| **Study Intersection** | **AM Peak** | | **PM Peak** | |
| | **Delay** | **LOS** | **Delay** | **LOS** |
| 1. ORH-Conde Ln/Windsor River Rd | 36.4 | D | 27.1 | C |
| 2. ORH/US 101 SB Ramps | 28.1 | C | 23.4 | C |
| 3. ORH/US 101 NB Off-ramp-Lakewood Dr | 32.9 | C | 57.1 | E |

Notes: Delay is measured in average seconds per vehicle; LOS = Level of Service; ORH = Old Redwood Highway

It is noted that the study intersection of Old Redwood Highway/US 101 northbound off-ramp-Lakewood Drive operates at a better service level during the morning peak hour under future conditions than under existing conditions. This is due to the identified future improvements near the study area; specifically, the addition of a northbound on-ramp to Highway 101 from Arata Lane, which is expected to reduce vehicular volumes at the study intersections.

## Project Description

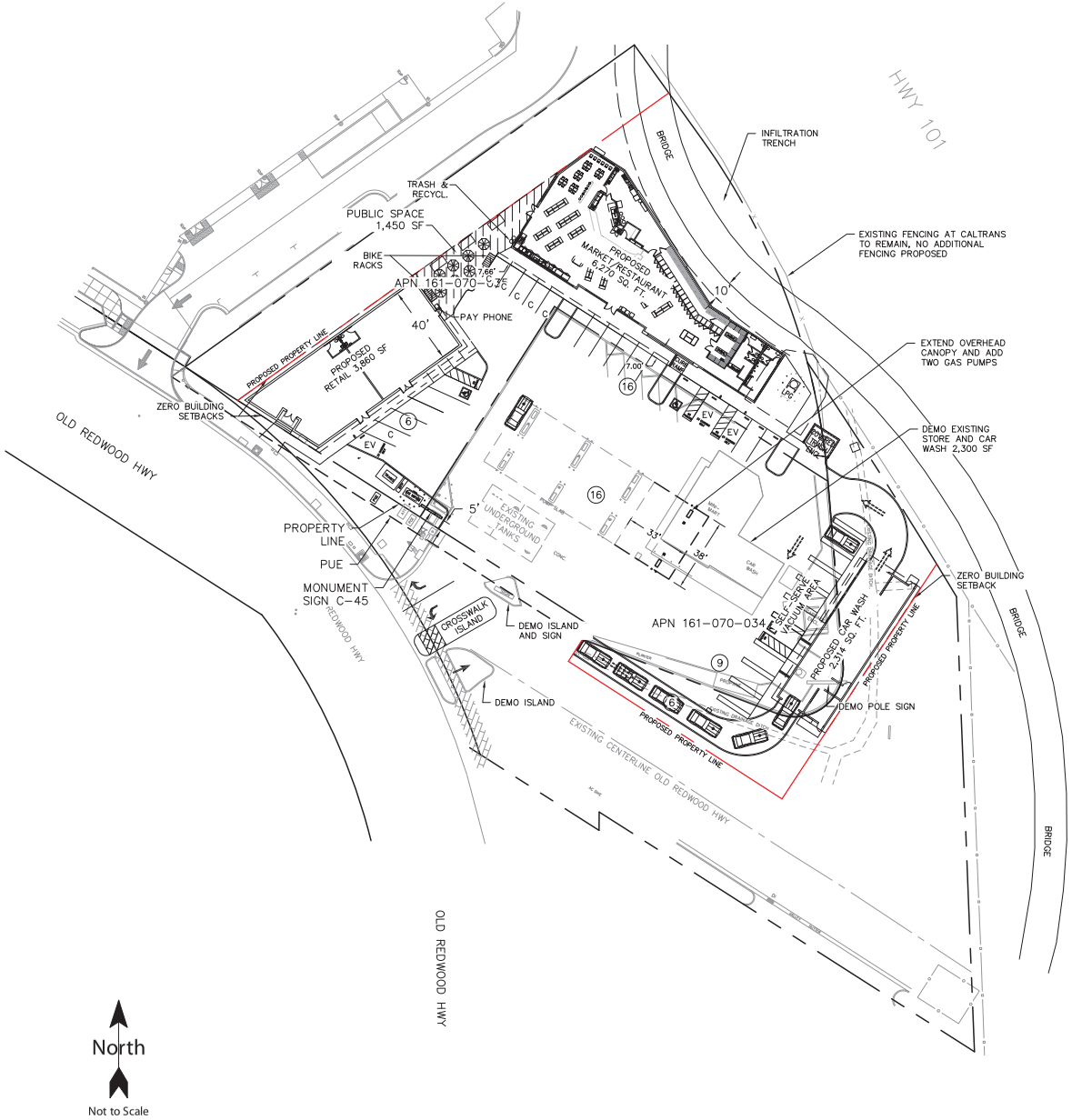
The proposed project is the redevelopment of the existing Chevron facility at 9120 Old Redwood Highway and adjacent vacant parcel. The existing convenience store and car wash would be demolished, though the six existing fuel pumps and canopy would remain. New uses would include a 6,270-square foot convenience store and restaurant, a 3,860-square foot retail storefront to house one or two tenants, a tunnel car wash with ten self-service vacuum stations, two additional fuel dispensers, and two EV charging stations. The project site would have 55 vehicle parking spaces and bicycle parking at the west entrance of the convenience store. Site access would be modified so that inbound trips would occur directly from Old Redwood Highway rather than via the section of Old Redwood Highway that was abandoned when the US 101 South Ramps intersection was realigned and signaled. The proposed project site plan is shown in Figure 4.

## Trip Generation

The anticipated trip generation for the project was estimated using standard rates published by the Institute of Transportation Engineers (ITE) in the *Trip Generation Manual*, 10th Edition, 2017 for "Super Convenience Market/Gas Station" (Land Use #960) and "Shopping Center" (Land Use #820). Because the site is currently occupied by the existing Chevron and convenience store, the trip generation of the existing uses was considered using rates for "Gasoline/Service Station with Convenience Market" (Land Use #945).

### Pass-by Trips

Some portion of traffic associated with the gas station is drawn from existing traffic on nearby streets. These vehicle trips are not considered "new," but are instead comprised of drivers who are already driving on the adjacent street system and choose to make an interim stop, and are referred to as "pass-by." The percentage of these pass-by trips was developed based on information provided in the *Trip Generation Manual*. This reference includes pass-by data collected at numerous locations for many land uses, such as the gas station use applied in this traffic analysis. Rates for both the a.m. and p.m. peak periods are available for gas stations. These rates were applied as a deduction to the overall trips generated by the project. At the proposed project, pass-by trips would in essence be "captured" from traffic on Old Redwood Highway.




LEGEND

| | |
|---|---|
| (16) | NO. OF PARKING SPACES IN AREA |
| EV | ELECTRIC VEHICLE CHARGING |

PARKING TABLE

| USE | AREA (SQUARE FEET) | PARKING FACTOR | Parking Factor | SPACE(S) | |
|---|---|---|---|---|---|
| PARKING REQUIRED: | | | | | |
| CAR WASH | | 10 + 6 PER WASH LANE | 6 | 16 | |
| CONVENIENCE STORE | 5,780 | 1/250 SQUARE FEET | 250 | 23 | |
| GENERAL STORE | 3,860 | 1/200 SQUARE FEET | 200 | 19 | |
| PROPANE SALES | | 1 PER PUMP | 1 | 1 | |
| RESTAURANT | 400 | 1/60 SQ. FT. DINING AREA | 60 | 7 | |
| | | TOTAL PARKING REQUIRED: | | 66 | |
| PARKING PROVIDED: | | | | | |
| FULL SIZE, STRIPED | | | | 11 | |
| COMPACT, STRIPED | | | | 6 | 0.10 |
| ELECTRIC VEHICLE CHARGING | | | | 3 | |
| FUELING POSITIONS | | | | 16 | |
| LOADING | | | | 1 | |
| VACUUM POSITIONS | | | | 8 | |
| VAN ACCESSIBLE | | | | 1 | |
| ACCESSIBLE | | | | 3 | |
| Credit for Removing Proposed Parking at Front | | | | 7 | |
| Car Wash Stacking | | | | 6 | |
| | | TOTAL PARKING PROVIDED: | | 62 | |

Source: Trans Tech Consultants 6/18

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# Traffic Impact Study for the Chevron Remodel Project

## Figure 4 – Site Plan

## Total Project Trip Generation

The expected trip generation potential for the proposed project is indicated in Table 6, with deductions taken for trips made to and from the existing Chevron facility at the site as well as for pass-by trips. After deductions are considered, the project would be expected to generate 1,540 net new primary trips on a daily basis, including 145 during the morning peak hour and 131 during the evening peak hour; these new trips represent the increase in traffic associated with the project compared to existing volumes.

**Table 6 – Trip Generation Summary**

| Land Use | Units | Daily | | AM Peak Hour | | | | PM Peak Hour | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Rate | Trips | Rate | Trips | In | Out | Rate | Trips | In | Out |
| **Existing** | | | | | | | | | | | |
| Gasoline/Svc Station w/ Convenience Mkt | 12 vfp | 205.36 | 2,464 | 12.47 | 150 | 76 | 74 | 13.99 | 168 | 86 | 82 |
| *Pass-by* | | *-50%* | *-1,232* | *-62%* | *-93* | *-47* | *-46* | *-56%* | *-94* | *-48* | *-46* |
| **Proposed** | | | | | | | | | | | |
| Super Convenience Market/Gas Station | 6.27 ksf | 837.58 | 5,252 | 83.14 | 521 | 261 | 260 | 69.28 | 434 | 217 | 217 |
| *Pass-by* | | *-50%* | *-2,626* | *-62%* | *-323* | *-162* | *-161* | *-56%* | *-244* | *-122* | *-122* |
| Shopping Center | 3.86 ksf | 37.75 | 146 | 0.94 | 4 | 2 | 2 | 3.81 | 15 | 7 | 8 |
| **Net Increase in Trips** | | | **1,540** | | **145** | **72** | **73** | | **131** | **64** | **67** |

Note: vfp = vehicle fueling positions; ksf = 1,000 square feet

## Trip Distribution

Given the project location together with the proposed use, most of the trips are expected to be to and from US 101. The remaining trips are assumed to have origins/destinations within the Town of Windsor, to the north via Old Redwood Highway, west via Windsor River Road, south via Conde Lane, or east via Old Redwood Highway. The proposed distribution assumptions are shown in Table 7.

**Table 7 – Trip Distribution Assumptions**

| Route | Percent | Daily Trips | AM Trips | PM Trips |
|---|---|---|---|---|
| To/from the North via US 101 | 20% | 308 | 29 | 26 |
| To/from the North via Old Redwood Hwy | 5% | 77 | 7 | 7 |
| To/from the South via US 101 | 30% | 462 | 43 | 39 |
| To/from the South via Conde Ln | 5% | 77 | 7 | 7 |
| To/from the East via Old Redwood Hwy | 30% | 462 | 43 | 39 |
| To/from the West via Windsor River Rd | 10% | 154 | 15 | 13 |
| **Total** | **100%** | **1540** | **144*** | **131** |

Note: The sum of trips does not equal the calculated trip generation due to rounding

## Intersection Operation

### Existing plus Project Conditions

Upon the addition of project-related traffic to the Existing volumes, the study intersections are expected to continue operating acceptably at LOS E or better. Project traffic volumes are shown in Figure 5, and Existing plus Project levels of service are summarized in Table 8.

**Table 8 – Existing and Existing plus Project Peak Hour Intersection Levels of Service**

| Study Intersection | Existing Conditions | | | | Existing plus Project | | | |
|---|---|---|---|---|---|---|---|---|
| | AM Peak | | PM Peak | | AM Peak | | PM Peak | |
| | Delay | LOS | Delay | LOS | Delay | LOS | Delay | LOS |
| 1. ORH-Conde Ln/Windsor River Rd | 29.5 | C | 23.0 | C | 30.1 | C | 23.8 | C |
| 2. ORH/US 101 SB Ramps | 23.2 | C | 20.4 | C | 23.1 | C | 20.3 | C |
| 3. ORH/US 101 NB Off-ramp-Lakewood Dr | 54.4 | D | 54.5 | D | 57.9 | E | 56.6 | E |

Notes: Delay is measured in average seconds per vehicle; LOS = Level of Service; ORH = Old Redwood Highway

**Finding** – The study intersections are expected to continue operating acceptably upon the addition of project-generated traffic.

### Future plus Project Conditions

Upon the addition of project-generated traffic to the anticipated Future volumes, and with the planned improvements, the study intersections are expected to continue operating at acceptable service levels. The Future plus Project operating conditions are summarized in Table 9.

**Table 9 – Future and Future plus Project Peak Hour Intersection Levels of Service**

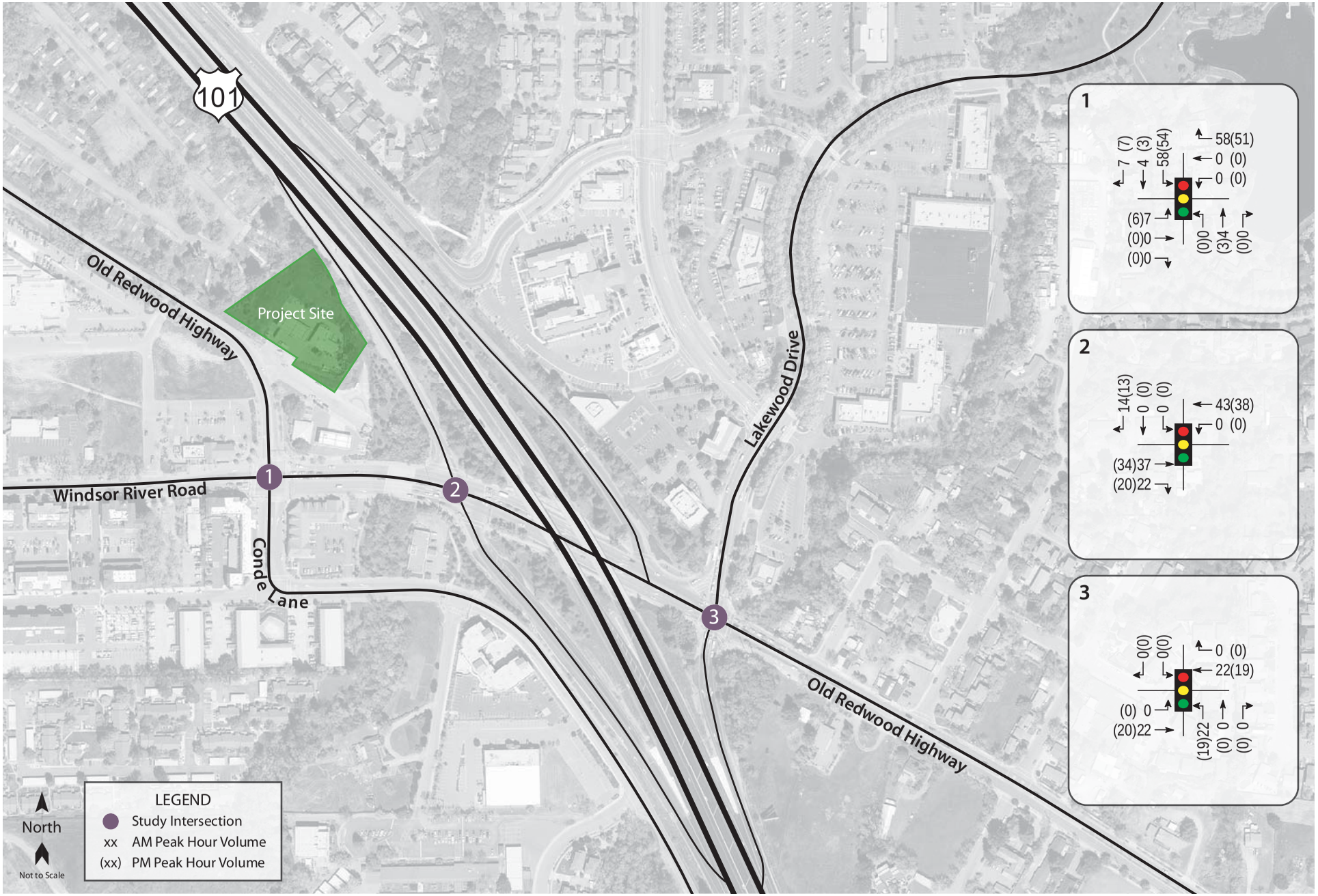
| Study Intersection | Future Conditions | | | | Future plus Project | | | |
|---|---|---|---|---|---|---|---|---|
| | AM Peak | | PM Peak | | AM Peak | | PM Peak | |
| | Delay | LOS | Delay | LOS | Delay | LOS | Delay | LOS |
| 1. ORH-Conde Ln/Windsor River Rd | 36.4 | D | 27.1 | C | 38.5 | C | 28.4 | C |
| 2. ORH/US 101 SB Ramps | 28.1 | C | 23.4 | C | 30.1 | C | 23.6 | C |
| 3. ORH/US 101 NB Off-ramp-Lakewood Dr | 32.9 | C | 57.1 | E | 33.3 | C | 59.2 | E |

Notes: Delay is measured in average seconds per vehicle; LOS = Level of Service; ORH = Old Redwood Highway; ** = delay greater than 120 seconds

**Finding** – The study intersections are expected to continue operating acceptably at LOS E or better with project traffic added, at the same Levels of Service as without it.

## Queuing

Under each scenario, the projected 95$^{th}$ percentile queues in dedicated turn pockets at the study intersections were determined using Vistro. Summarized in Table 10 are the predicted queue lengths for dedicated turn lanes on the approaches to the three study intersections. It is noted that because the southbound approach to Old




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Traffic Impact Study for the Chevron Remodel Project

**Figure 5 – Project Traffic Volumes**

Redwood Highway/Windsor River Road-Conde Lane has a shared left-turn/through/right-turn lane, the available stacking space includes both the dedicated left-turn lane and the shared lane.

**Table 10 – 95th Percentile Queues Exceeding Available Storage**

| Study Intersection Approach | Available Storage | 95th Percentile Queues | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | AM Peak Hour | | | | PM Peak Hour | | | |
| | | E | E+P | F | F+P | E | E+P | F | F+P |
| ORH-Conde Ln/Windsor River Rd | | | | | | | | | |
| Eastbound Left-turn | 115 | 32 | 42 | 34 | 43 | 25 | 34 | 36 | 44 |
| Westbound Left-turn | 225 | **324** | **324** | **245** | **245** | **237** | **237** | **312** | **312** |
| Westbound Right-turn | 80 | 5 | 6 | 4 | 5 | 14 | 17 | 7 | 9 |
| Northbound Left-turn | 100 | 57 | 57 | 34 | 34 | 122 | 122 | 51 | 51 |
| Northbound Right-turn | 70 | **112** | **112** | **248** | **248** | **76** | **76** | **182** | **182** |
| Southbound Left-turn | 180/500 | 269 | 303 | 395 | 448 | 243 | 270 | 247 | 282 |
| ORH/US 101 SB Ramps | | | | | | | | | |
| Eastbound Right-turn | 435 | 233 | 250 | **456** | **483** | 202 | 215 | 246 | 262 |
| Westbound Left-turn | 425 | **644** | **644** | **605** | **605** | **448** | **448** | **485** | **485** |
| ORH/US 101 NB Ramp | | | | | | | | | |
| Eastbound Left-turn | 175 | 140 | 140 | 108 | 109 | 171 | 171 | 168 | 168 |

Notes: 95th Percentile Queue based on the Vistro operational analysis output; all distances are measured in feet; E = existing conditions; E+P = existing plus project conditions; F = future conditions; F+P = future plus project conditions; **Bold** text = queue length exceeds available storage

**Finding** – The 95th percentile queues exceed the available storage space for several approaches under at least one scenario, though the project would be expected to result in no increase in the queue length for most of the impacted movements. The project would cause 95th percentile queues on the southbound approach to the intersection of Old Redwood Highway-Conde Lane/Windsor River Road to increase by more than ten feet under all scenarios during both peak hours; however, because this would occur in a shared lane and therefore not result in a safety concern, the impact is considered less-than-significant.

Queuing in the eastbound right-turn lane from Old Redwood Highway to US 101 South also exceeds the available stacking space during the morning peak hour under projected future volumes and would be expected to increase by more than ten feet with project traffic added. It is noted that the stacking space is the entire length of the block between Conde Lane and US 101 South, so there is no potential for increasing stacking length within the block to accommodate the projected future queues. The only potential option for increasing the stacking length would be to add a second right-turn lane on this approach. Given the proximity of Windsor Creek just west of the US 101 South ramps and the Old Redwood Highway Bridge that spans it, such an improvement would have substantial negative impacts on this waterway. It is further noted that future operating conditions are based on projections that may or may not be realized. Changes in transportation modes are rapidly evolving, and may result in less travel demand in the future compared to today – which is one of the goals of using Vehicle Miles Traveled (VMT) as a metric for evaluating the impacts of future development. Because there is not a feasible improvement coupled with the potential for future volumes to vary from those projected, and noting that the queue is expected to exceed the available stacking length without or with the project, the queuing impact may be considered less-than-significant with the Town Engineer's approval.

**Recommendation** – The Town Engineer should consider granting an exception to the Town's queuing policy for the eastbound right-turn movement from Old Redwood Highway to US 101 South for the reasons mentioned above.

# Alternative Modes

## Pedestrian Facilities

Given the proximity of the project site to the Town Green and associated commercial and public facilities as well as nearby residential land uses, it is reasonable to assume that some project patrons and employees will want to walk, bicycle, and/or use transit to reach the project site. Existing sidewalks on Windsor River Road and Old Redwood Highway connect the project site to the nearby transit stops for both Routes 60 and 66.

**Project Site** – Existing sidewalks along the project frontage are well-connected to the surrounding pedestrian network. Additionally, the applicant plans to exchange land with the Town of Windsor to accommodate a walking path on the northwest side of the property as well as the area underneath the future pedestrian bridge which is currently in a conceptual planning stage. Project plans also include a bicycle and pedestrian promenade along the southwest side of the property which would provide a connection to the pedestrian bridge. These future plans are shown in a preliminary drawing in Figure 6.

**Finding** – Pedestrian facilities serving the project site are adequate.

## Bicycle Facilities

Existing bicycle facilities, including Class II bike lanes on Old Redwood Highway and Conde Lane and Class III bike lanes on Windsor River Road, together with planned future facilities and shared use of minor streets provide adequate access for bicyclists.

### Bicycle Storage

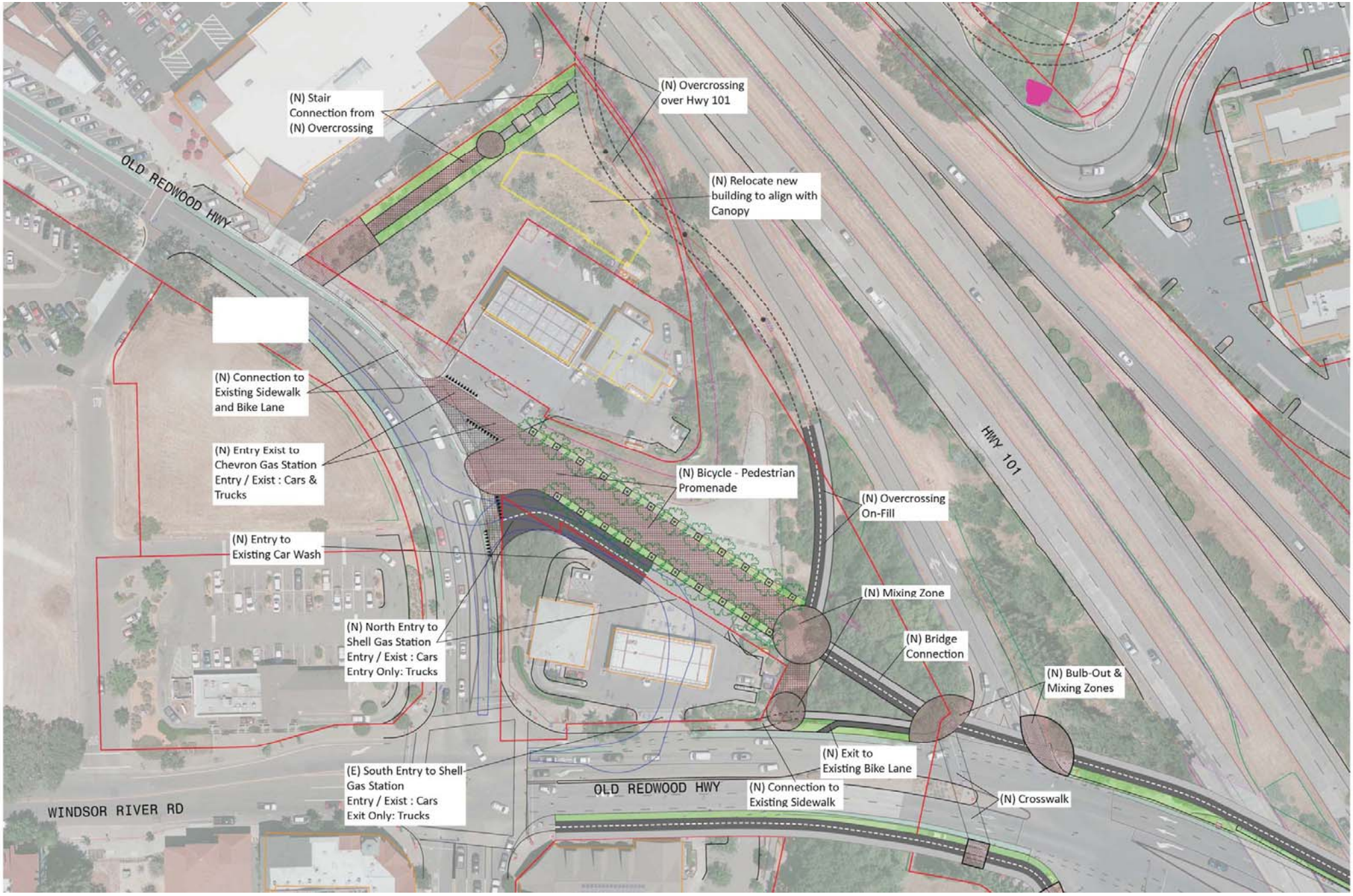
Short-term bicycle parking will be provided at the site by bike racks to be located on the northeast side of the proposed retail store. Zoning regulations for the Town of Windsor do not state a rate at which bicycle parking should be provided for commercial projects. According to the County of Sonoma's municipal code, Section 26-86-010, commercial projects should provide one bicycle parking space per five spaces of required automobile parking. With a vehicle parking requirement of 66 spaces, the project should provide a minimum of 13 bicycle parking spaces.

**Recommendation** – The project applicant should ensure the storage can accommodate at least 13 bicycles.

## Transit

Existing transit routes are adequate to accommodate project-generated transit trips. Existing stops are within a quarter-mile of the site, which is considered to be acceptable walking distance, with continuous sidewalk and pedestrian phasing at the signalized intersection of Old Redwood Highway-Conde Lane/Windsor River Road to serve such trips.

**Finding** – Transit facilities serving the project site are adequate.






Traffic Impact Study for the Chevron Remodel Project

**Figure 6 – Preliminary Plans for Bicycle-Pedestrian Promenade**

# Access and Circulation

## Site Access

As proposed, the project would take access via a modified full-access driveway on Old Redwood Highway. The existing pedestrian refuge island located in the middle of the driveway would be removed and a new pedestrian island would be installed slightly north of the existing location, creating a more direct path for inbound trips. The modifications proposed are consistent with a planned bicycle-pedestrian promenade along the abandoned section of Old Redwood Highway between the Chevron and Shell gas stations. It is noted that the planned promenade would eliminate access from the north side of the Shell station unless a new driveway were to be built. In the interim, however, modification made to the Chevron site would need to ensure that access to and from the Shell is maintained.

**Recommendation**: The driveway modifications should be designed to ensure compliance with plans for the bicycle-pedestrian promenade. Striping should be installed as necessary to maintain full access to the Shell station through what is currently a very wide eastbound land until these planned improvements are constructed.

### Sight Distance

At driveways a substantially clear line of sight should be maintained between the driver of a vehicle waiting on the driveway and the driver of an approaching vehicle. Sight distances along Old Redwood Highway from the project access point were evaluated based on stopping sight distance criteria contained in the *Highway Design Manual* published by Caltrans. Sight distances at the proposed driveway were measured based on aerial photography available from Google Earth. Based on a design speed of 25 mph, the minimum stopping sight distance needed is 150 feet. Sight lines south of the driveway exceed 300 feet, extending past the Old Redwood Highway-Conde Lane/Windsor River Road intersection. Similarly, sight lines north of the project driveway are clear for more than 500 feet towards the roundabout at the intersection of Old Redwood Highway/Market Street. To maintain adequate sight distance for drivers of fuel tankers, it is noted that any vegetation near the project's driveways should be trimmed down to a height of less than three feet and trees trimmed up so that nothing hangs below a height of eight feet from the surface of the roadway.

### On-Site Circulation

The AutoTURN application of AutoCAD was used to evaluate the adequacy of on-site passenger vehicle access for the car wash in the proposed site plan layout. Graphics indicating travel paths for passenger vehicles accessing the car wash and fuel tankers traversing the site are provided in Appendix D.

**Findings** – The proposed modifications to the splitter island at Old Redwood Highway as shown on the site plan used for this analysis would limit access to the Shell station.

**Recommendation** – The island modifications should be designed to ensure that access to the Shell station is retained.

# Parking

Based on the most recent site plan, the proposed project would provide 55 parking spaces, including 10 spaces for the self-serve vacuum area with five stacking spaces at the car wash tunnel entrance and one space inside the tunnel, 16 spaces for vehicle fueling, and 23 spaces to be shared by the retail, convenience market, and restaurant uses.

The *Town of Windsor Zoning Ordinance* stipulates the Town's parking requirements for new developments. Parking requirements are specified by land use. As shown in Table 11, based on the Town's requirements, the proposed project would be required to supply 60 vehicle parking spaces, which is greater than the proposed supply.

**Table 11 – Parking Analysis**

| Land Use | Units | Rate | Parking Spaces |
|---|---|---|---|
| **Town Parking Requirements** | | | |
| General Retail Stores | 3.86 ksf | 1 space/200 sf | 19 |
| Full Service Car Wash | | 10 spaces + 6 spaces for each wash lane for queueing and drying area | 16 |
| Service Stations | 6.27 ksf | 1 space/250 sf plus 3 spaces/service bay | 25 |
| *Town Required Parking Total* | | | *60* |
| **ITE Parking Demand Estimate** | | | |
| Gasoline/Service Station w/Convenience Market | 16 vfp | 1.03 spaces / vfp | 17 |
| Shopping Center* | 3.86 ksf | 3.16 spaces / ksf | 12 |
| Fast-Food Restaurant w/o Drive-Through Window, Non-Hamburger | 0.4 ksf | 12.33 spaces / ksf | *5* |
| *ITE Parking Demand Estimate Total* | | | *34* |
| Car wash (per Town requirements) | | | 16 |
| *Total Parking Demand Estimate* | | | 50 |
| **Proposed Parking Supply** | | | **55** |

Notes: ksf = 1,000 square feet; sf = square foot; vfp = vehicle fueling position; * Because ITE *Parking Generation* did not have parking generation rates for Specialty Retail Center, Shopping Center (LU#820) rates were used instead

Parking demand was also estimated using standard rates published by ITE in *Parking Generation*, 4th Edition, 2010, for "Gasoline Service Station with Convenience Market" (ITE LU#945), "Shopping Center" (ITE LU#820), and "Fast-Food Restaurant without Drive-Through Window, Non-Hamburger" (ITE LU#933). All the rates indicate the 85th percentile of the peak demand, so reflect a conservative estimate of peak parking demand. Because ITE does not include parking demand rates for full service car washes, the Town's requirement was used. With these assumptions, the total expected parking demand for the gasoline station, convenience store, restaurant, and retail uses per ITE is 34 parking spaces and the required parking for the car wash per the Town's requirement is 16 spaces for a total demand of 50 spaces. With a planned supply of 55 spaces, there would be a sufficient supply to meet this anticipated demand with a surplus of 5 spaces.

**Finding** – Based on an analysis of anticipated actual parking demand associated with the various project components, it is anticipated that the proposed supply of 55 spaces will be adequate as it exceeds the projected peak demand.

**Recommendation** – The Town may wish to consider allowing a reduction from the Town code requirements of five spaces to avoid having an excessive parking supply on the site.

# Conclusions and Recommendations

## Conclusions

- The proposed project is expected to generate an average of 1,540 net new daily trips, including 145 weekday a.m. peak hour trips and 131 weekday p.m. peak hour trips.
- Under existing conditions, the study intersections operate at acceptable LOS E or better and would be expected to continue operating acceptably with the addition of project-generated traffic.
- Under anticipated future volumes, the study intersections are expected to operate acceptably at LOS E or better during both peak hours and would be expected to continue operating at the same service levels with the project as without it.
- Existing pedestrian facilities along the project frontage on Old Redwood Highway and in the surrounding areas are adequate for the proposed project.
- Bicycle facilities, including Class II bike lanes on Old Redwood Highway and Conde Lane and Class III bike routes on Windsor River Road, along with planned future facilities, provide adequate access for bicyclists.
- Transit facilities connect the site to communities from Santa Rosa to Cloverdale and the site is served by bus stops within a quarter-mile walking distance.
- Sight distance along Old Redwood Highway at the project driveway is adequate for the 25-mph design speed.
- On-site circulation is expected to operate acceptably.
- The proposed parking supply is expected to be adequate based on ITE parking demand concepts.

## Recommendations

- Parking for at least 13 bicycles should be provided in the bicycle storage area.
- The Town may wish to grant a parking variance to reflect the anticipated actual peak parking demand.
- The island modifications should be designed to ensure that access to the Shell station is retained

# Study Participants and References

## Study Participants

| | |
|---|---|
| **Principal in Charge** | Dalene J. Whitlock, PE, PTOE, |
| **Transportation Planner** | Zack Matley, AICP |
| **Assistant Engineer** | Kevin Rangel, EIT |
| **Assistant Planner** | Andre Huff |
| **Graphics/Editing/Formatting** | Alex Scrobonia |

## References


*2013 Collision Data on California State Highways*, California Department of Transportation, 2016
*Guide for the Preparation of Traffic Impact Studies*, California Department of Transportation, 2002
*Guidelines for Traffic Impact Studies*, County of Sonoma, 2016
*Highway Capacity Manual*, Transportation Research Board, 2010
*Highway Design Manual*, 6th Edition, California Department of Transportation, 2017
*Parking Generation*, 4th Edition, Institute of Transportation Engineers, 2010
*Recommended Guidelines for Toll Collection Equipment Technology*, Federal Highway Administration, 2006
Sonoma County Transit, http://sctransit.com/
Sonoma Marin Area Rail Transit, http://sonomamarintrain.org/
*Statewide Integrated Traffic Records System (SWITRS)*, California Highway Patrol, 2012-2017
*Town of Windsor 2040 General Plan: Revised Public Review Draft*, Town of Windsor, 2017
*Town of Windsor Zoning Ordinance,* Town of Windsor, 2014
*Trip Generation Manual*, 10th Edition, Institute of Transportation Engineers, 2017
*Windsor Bicycle & Pedestrian Master Plan*, Sonoma County Transportation Authority, 2014


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# Appendix A

## Caltrans Letter and Response-to-Comments Letter

**DEPARTMENT OF TRANSPORTATION**
DISTRICT 4
P.O. BOX 23660
OAKLAND, CA 94623-0660
PHONE (510) 286-5528
FAX (510) 286-5559
TTY 711
www.dot.ca.gov

*Making Conservation a California Way of Life!*

August 31, 2017

04-SON-2017-00178
SON-101-29.57
GTS ID 7375

Ms. Kim Voge
Town of Windsor
Community Development Department
9291 Old Redwood Highway
Town of Windsor, CA 95492

**Chevron Remodel at 9120 Old Redwood Hwy – Use Permit**

Dear Ms. Voge:

Thank you for including the California Department of Transportation (Caltrans) in the environmental review process for the above-referenced project. In tandem with the Metropolitan Transportation Commission's (MTC) Sustainable Communities Strategy (SCS), Caltrans mission signals a modernization of our approach to evaluating and mitigating impacts to the State Transportation Network (STN). Caltrans' *Strategic Management Plan 2015-2020* aims to reduce Vehicle Miles Travelled (VMT) by tripling bicycle and doubling both pedestrian and transit travel by 2020. Our comments are based on the Use Permit.

***Project Understanding***

The applicant requests a Design Review, Use Permit, and Lot Line Adjustment for the redevelopment of the existing Chevron facility located at 9120 Old Redwood Highway. The proposal includes demolition of the existing convenience store and car wash. The six existing fuel dispensers, canopy and all underground piping and lines will remain. The applicant proposes to construct the following: a 6,200 square feet (sf) convenience store and restaurant with outdoor seating, a 3,500 sf retail building for one or two tenants, a 2,314 sf (85 foot long) tunnel car wash, ten self-service vacuum stations, two additional fuel dispensers with an enlarged canopy, replacement of an existing bulk propane dispenser with new 1,000 gallon vertical tank, and the removal of the Chevron "high rise" sign at the southeast corner of the lot. The proposed Lot Line Adjustment will swap land with the Town to accommodate a walking path/pedestrian bridge on the northwest side of the property and the proposed car wash on the south side. The project site is adjacent to US 101. Access to the project site will be provided via the US 101 on- and off-ramps at Old Redwood Highway located approximately 0.1 miles southwest of the project site.

***Lead Agency***
As the Lead Agency, the Town of Windsor (Town) is responsible for all project mitigation, including any needed improvements to the STN. The project's financing, scheduling, implementation responsibilities and monitoring should be fully discussed for all proposed mitigation measures.

***Travel Demand Analysis***
We are concerned with the projected increase in generated trips, which have the potential to create significant speed differentials and increase the number of conflicts. Trip generation and distribution should be identified to determine the scope and significance of issues that may arise from the project's potential conflicts. The California Environmental Quality Act (CEQA) does not exempt these types of operational concerns from evaluation.

With the enactment of Senate Bill (SB) 743, Caltrans is focusing on transportation infrastructure that supports smart growth and efficient development. Recently approved guidance for incorporating SB 743 (*Local Development-Intergovernmental Review Program Interim Guidance, November 2016*) intends to ensure that development projects align with State policies through the use of efficient development patterns, innovative travel demand reduction strategies, necessary multimodal roadway improvements, and VMT as the primary transportation impact metric.

In Caltrans' *Smart Mobility 2010: A Call to Action for the New Decade*, this project falls under **Place Type 5 Rural and Agricultural Lands – Rural Towns**, which includes settlement patterns with widely-spaced towns separated by farms, vineyards, orchard, or grazing lands, which can significantly affect land uses, character and mobility needs. This place type has a mix of housing, services and public institutions in compact form to serve surrounding rural areas. Given this Place Type and intensification of use, which typically leads to high levels of VMT and corresponding low levels of active transportation, we recommend analyzing travel demand by providing VMT analysis resulting from the proposed project which includes:

- A vicinity map, regional location map, and site plan clearly showing the project's location in relation to the STN. Clearly identify State right-of-way (ROW), bicycle paths, and transit facilities within the study area.
- A VMT analysis pursuant to the Town's guidelines or, if the Town has no guidelines, the Office of Planning and Research's Draft Guidelines. Projects that result in automobile VMT per capita greater than 15 percent below existing (i.e. baseline) county-wide or regional values for similar land use types may indicate a significant impact. If necessary, mitigation for increasing VMT should be identified. Mitigation should support the use of transit and active transportation modes. Potential mitigation measures that include the requirements of other agencies—such as Caltrans—are fully enforceable through permit conditions, agreements, or other legally-binding instruments under the control of the County.
- Potential safety issues for all road users should be identified and fully mitigated.
- The project's primary and secondary effects on pedestrians, bicycles, disabled travelers and

transit performance should be evaluated, including countermeasures and trade-offs resulting from mitigating VMT increases. Access to pedestrians, bicycle, and transit facilities must be maintained during construction.

***Vehicle Trip Reduction***

Given this Place Type and the opportunities to reduce VMT, we recommend the Lead Agency implement the following Transportation Demand Management (TDM) elements described below:

- Project design to encourage walking, bicycling, and convenient transit access;
- Electric vehicle (EV) charging stations and designated parking spaces for EVs and clean fuel vehicles;
- Secured bicycle storage facilities; and
- Decrease headway times and improve way-finding on nearby bus lines to provide a better connection between the project, nearby transit stations and regional destinations.

For additional TDM options, please refer to Chapter 8 of Federal Highway Administration's *Integrating Demand Management into the Transportation Planning Process: A Desk Reference*, regarding TDM at the local planning level. The reference is available online at: http://www.ops.fhwa.dot.gov/publications/fhwahop12035/fhwahop12035.pdf.
For information about parking ratios, please see MTC's report, Reforming Parking Policies to Support Smart Growth, or visit the MTC parking webpage: http://www.mtc.ca.gov/planning/smart_growth/parking.

***Multimodal Planning***

This project is located within a Priority Development Area (PDA) in the City of Santa Rosa. PDA's are identified by the Association of Bay Area Governments as areas for investment, new homes, and job growth. To support PDA goals, the project should be conditioned to ensure connections to existing bike lanes and multi-use trails to facilitate walking and biking to the project site. Specifically, the proposed project should connect to the existing and proposed SMART Trail, existing and proposed Windsor Creek Trail, Windsor Intermodal Station, the proposed Windsor SMART station, existing Class II Bike Lanes on Old Redwood Highway and Windsor River Road, and proposed Class III Bike Lanes on Old Redwood Highway, as shown in the 2014 update to the *Sonoma County Transportation Authority's Bicycle and Pedestrian Master Plan*. Providing these connections with streets configured for alternative transportation modes will reduce VMT by promoting usage of nearby Sonoma County Bus Routes 56, 60, 60X, and 66.

***Transportation Permit***

Project work that requires movement of oversized or excessive load vehicles on the STN requires a transportation permit that is issued by Caltrans. To apply, a completed transportation permit application with the determined specific route(s) for the shipper to follow from origin to destination must be submitted to: Caltrans Transportation Permits Office, 1823 14th Street, Sacramento, CA 95811-7119. See the following website for more information:

http://www.dot.ca.gov/hq/traffops/permits.

***Traffic Impact Fees***
Given the potential increase in VMT and proximity to US 101, the project should be conditioned to contribute fair share traffic impact fees toward multi-modal and regional transit improvements to fully mitigate cumulative impacts to regional transportation. These contributions would be used to reduce VMT and improve multimodal transportation facilities in the project vicinity. Caltrans strongly supports measures to increase sustainable mode shares and reduce VMT. The fair share information should also be presented in the Mitigation Monitoring and Reporting Plan of the Final Environmental Document. Required roadway improvements should be completed prior to the issuance of the Certificate of Occupancy.

***Encroachment Permit***
The applicant will be required to apply for and obtain an encroachment permit for any work within Caltrans ROW prior to construction. As part of the encroachment permit process, the applicant must provide appropriate CEQA environmental approval, where applicable, for potential environmental impacts within the ROW. The applicant is responsible for quantifying the environmental impacts of the improvements within Caltrans ROW (project-level analysis) and completing appropriate avoidance, minimization and mitigation measures. Any improvements/mitigation measure affecting the operations of SR 116 requires Caltrans review and approval.

To apply for an encroachment permit, please complete an encroachment permit application, environmental documentation, and five (5) sets of plans clearly indicating State ROW, and submit to the following address: David Salladay, District Office Chief, Office of Permits, California Department of Transportation, District 4, P.O. Box 23660, Oakland, CA 94623-0660. Traffic-related mitigation measures should be incorporated into the construction plans prior to the encroachment permit process. See the website linked below for more information: http://www.dot.ca.gov/hq/traffops/developserv/permits.

Should you have any questions regarding this letter, please call Stephen Conteh at 510-286-5534 or stephen.conteh@dot.ca.gov.

Sincerely,

PATRICIA MAURICE
District Branch Chief
Local Development - Intergovernmental Review

June 7, 2018

Ms. Kim Voge
Town of Windsor
Community Development Department
9291 Old Redwood Highway
Windsor, CA 95492

# Response to Caltrans Comments on the Chevron Remodel

Dear Ms. Voge;

We received the letter dated August 31, 2017, from Ms. Patricia Maurice of Caltrans District 4, and provide the following in response. Note that the comments are paraphrased and provided in italics for ease of review.

## Travel Demand Analysis

*We are concerned with the projected increase in generated trips, which have the potential to create significant speed differentials and increase the number of conflicts. The project's trip generation and distribution should be used to determine the scope and significance of issues that may arise from the project's potential conflicts.*

The *Traffic Impact Study for the Chevron Remodel Project* sets forth the project's anticipated trip generation and distribution. Further, this information was provided to Town staff along with the scope of work for the traffic study and their input received prior to preparing the study. The project results in redevelopment of a site that is already generating trips associated with the gas station, but the net increase due to the project was evaluated and its potential impacts on traffic operation determined. It is noted that the project driveway already exists, and is along a segment of Old Redwood Highway where the 25-mph speed limit is reinforced through use of traffic calming techniques, roundabouts, bike lanes and angled parking. Significant speed differentials and associated issues are therefore not anticipated.

*Caltrans recommends a robust Transportation Demand Management Program and requests a VMT analysis.*

The Town of Windsor has taken an aggressive stance on providing facilities for alternative modes as a way of reducing the travel demand for those who live and work in the Town. This includes provision of bicycle facilities connecting the site to regional trails as well as bus service. Further, the site is anticipated to be adjacent to one end of a planned pedestrian/bicycle connection under US 101 to improve access in the area. It is noted that the location of this site near the Town Center allows both employees and customers to walk or bike for trips other than to purchase fuel.

A VMT analysis was not prepared for this study for several reasons, among them the lack of any adopted standards against which to compare such findings. The "Technical Advisory on Evaluating Transportation Impacts in CEQA" published by the Office of Planning and Research (OPR) in November 2017 notes that "local-serving retail development tends to shorten trips and reduce VMT. Thus, lead agencies generally may presume that such development creates a less-than-significant transportation impact." Since this project would be a local-serving retail development, especially the fuel sales, it can be assumed that the VMT impact would be less-than-significant if there were a standard for its evaluation.

## Vehicle Trip Reduction

*Measures to reduce reliance on single-occupant vehicles are suggested.*

The project as proposed has incorporated some elements intended to reduce the transportation demand, including EV (electrical vehicle) charging stations, bicycle parking, sidewalks along the street frontage and connecting buildings within the side, and the terminus on one end of a planned freeway undercrossing for pedestrians and bicyclists.

### Multimodal Planning

*The proposed project should connect to existing and proposed trails and bike lanes.*

The project already provides such connections; no further modifications are proposed or necessary to achieve connectivity.

## Transportation Permit

*Movement of oversized or excessive load vehicles requires a transportation permit.*

No such movements are anticipated.

## Traffic Impact Fees

*The project should contribute fair share traffic impact fees.*

The Town of Windsor has a traffic mitigation impact fee program, and is expected to levy fees on the project as appropriate.

## Encroachment Permit

*An Encroachment Permit is required for any work in the Caltrans ROW.*

The project does not require any construction in the Caltrans ROW; no permits will therefore be needed.

We hope this information adequately addresses the comments from Caltrans. Please contact me if any further clarification is needed.

Sincerely,

Dalene J. Whitlock, PE, PTOE
Principal

DJW/djw/WIN128.R2C



# Appendix B

## Collision Rate Calculations

## Intersection Collision Rate Calculations

### Chevron Remodel TIS

**Intersection # 1:** Old Redwood Highway & Conde Lane/Windsor River Road
**Date of Count:** Tuesday, December 5, 2017

**Number of Collisions:** 12
**Number of Injuries:** 3
**Number of Fatalities:** 0
**ADT:** 25900
**Start Date:** September 1, 2012
**End Date:** August 31, 2017
**Number of Years:** 5

**Intersection Type:** Four-Legged
**Control Type:** Signals
**Area:** Urban

$$\text{collision rate} = \frac{\text{Number of Collisions x 1 Million}}{\text{ADT x 365 Days per Year x Number of Years}}$$

$$\text{collision rate} = \frac{12 \times 1{,}000{,}000}{25{,}900 \times 365 \times 5}$$

| | Collision Rate | Fatality Rate | Injury Rate |
|---|---|---|---|
| **Study Intersection** | **0.25 c/mve** | **0.0%** | **25.0%** |
| **Statewide Average*** | **0.27 c/mve** | **0.4%** | **41.9%** |

ADT = average daily total vehicles entering intersection
c/mve = collisions per million vehicles entering intersection
* 2013 Collision Data on California State Highways, Caltrans

**Intersection # 2:** Old Redwood Highway & US 101 SB Ramps
**Date of Count:** Tuesday, December 5, 2017

**Number of Collisions:** 6
**Number of Injuries:** 3
**Number of Fatalities:** 0
**ADT:** 28400
**Start Date:** September 1, 2012
**End Date:** August 31, 2017
**Number of Years:** 5

**Intersection Type:** Four-Legged
**Control Type:** Signals
**Area:** Suburban

$$\text{collision rate} = \frac{\text{Number of Collisions x 1 Million}}{\text{ADT x 365 Days per Year x Number of Years}}$$

$$\text{collision rate} = \frac{6 \times 1{,}000{,}000}{28{,}400 \times 365 \times 5}$$

| | Collision Rate | Fatality Rate | Injury Rate |
|---|---|---|---|
| **Study Intersection** | **0.12 c/mve** | **0.0%** | **50.0%** |
| **Statewide Average*** | **0.43 c/mve** | **0.4%** | **37.9%** |

ADT = average daily total vehicles entering intersection
c/mve = collisions per million vehicles entering intersection
* 2013 Collision Data on California State Highways, Caltrans

## Intersection Collision Rate Calculaions

### Chevron Remodel TIS

**Intersection # 3:** Old Redwood Highway & US 101 NB Off-Ramp/Lakewood Drive
**Date of Count:** Tuesday, December 5, 2017

**Number of Collisions:** 27
**Number of Injuries:** 13
**Number of Fatalities:** 0
**ADT:** 39600
**Start Date:** September 1, 2012
**End Date:** August 31, 2017
**Number of Years:** 5

**Intersection Type:** Four-Legged
**Control Type:** Signals
**Area:** Urban

$$\text{collision rate} = \frac{\text{Number of Collisions x 1 Million}}{\text{ADT x 365 Days per Year x Number of Years}}$$

$$\text{collision rate} = \frac{27 \times 1{,}000{,}000}{39{,}600 \times 365 \times 5}$$

| | Collision Rate | Fatality Rate | Injury Rate |
|---|---|---|---|
| **Study Intersection** | **0.37 c/mve** | **0.0%** | **48.1%** |
| **Statewide Average*** | **0.27 c/mve** | **0.4%** | **41.9%** |

ADT = average daily total vehicles entering intersection
c/mve = collisions per million vehicles entering intersection
* 2013 Collision Data on California State Highways, Caltrans

# Appendix C

## Intersection Level of Service Calculations

**Intersection Level Of Service Report**
**Intersection 1: Old Redwood Hwy/Windsor River Rd**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 29.5 |
| Analysis Method: | HCM 2010 | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.598 |

**Intersection Setup**

| Name | Conde Ln | | | Old Redwood Hwy | | | Windsor River Rd | | | Old Redwood Hwy | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | | | | | | | | | | | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Pocket | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 0 |
| Pocket Length [ft] | 75.00 | 100.00 | 75.00 | 75.00 | 100.00 | 100.00 | 75.00 | 100.00 | 75.00 | 200.00 | 100.00 | 100.00 |
| Speed [mph] | 35.00 | | | 35.00 | | | 30.00 | | | 35.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | No | | | No | | | No | | | No | | |

**Volumes**

| Name | Conde Ln | | | Old Redwood Hwy | | | Windsor River Rd | | | Old Redwood Hwy | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 43 | 92 | 239 | 314 | 110 | 8 | 22 | 600 | 31 | 259 | 405 | 270 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Rate | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right-Turn on Red Volume [veh/h] | 0 | 0 | 129 | 0 | 0 | 0 | 0 | 0 | 10 | 0 | 0 | 59 |
| Total Hourly Volume [veh/h] | 43 | 92 | 110 | 314 | 110 | 8 | 22 | 600 | 21 | 259 | 405 | 211 |
| Peak Hour Factor | 0.9200 | 0.9200 | 0.9200 | 0.9200 | 0.9200 | 0.9200 | 0.9200 | 0.9200 | 0.9200 | 0.9200 | 0.9200 | 0.9200 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 12 | 25 | 30 | 85 | 30 | 2 | 6 | 163 | 6 | 70 | 110 | 57 |
| Total Analysis Volume [veh/h] | 47 | 100 | 120 | 341 | 120 | 9 | 24 | 652 | 23 | 282 | 440 | 229 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |



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**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | 1 - Central Windsor |
| Cycle Length [s] | 112 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 20.0 |
| Offset Reference | LeadGreen |
| Permissive Mode | SingleBand |
| Lost time [s] | 12.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Overlap | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Overlap |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal group | 8 | 8 | 1 | 7 | 7 | 0 | 5 | 2 | 0 | 1 | 6 | 7 |
| Auxiliary Signal Groups | | | 1,8 | | | | | | | | | 6,7 |
| Lead / Lag | Lag | - | - | Lead | - | - | Lag | - | - | Lead | - | - |
| Minimum Green [s] | 10 | 10 | 9 | 10 | 10 | 0 | 9 | 8 | 0 | 9 | 8 | 10 |
| Maximum Green [s] | 34 | 34 | 30 | 34 | 34 | 0 | 15 | 52 | 0 | 30 | 52 | 34 |
| Amber [s] | 3.2 | 3.2 | 3.6 | 3.2 | 3.2 | 0.0 | 3.2 | 3.2 | 0.0 | 3.6 | 3.6 | 3.2 |
| All red [s] | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.0 | 0.2 | 0.2 | 0.0 | 0.2 | 0.2 | 0.2 |
| Split [s] | 29 | 29 | 24 | 24 | 24 | 0 | 15 | 35 | 0 | 24 | 44 | 24 |
| Vehicle Extension [s] | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 3.0 |
| Walk [s] | 4 | 4 | 0 | 4 | 4 | 0 | 0 | 5 | 0 | 0 | 5 | 4 |
| Pedestrian Clearance [s] | 25 | 25 | 0 | 20 | 20 | 0 | 0 | 23 | 0 | 0 | 23 | 20 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 2.0 |
| I2, Clearance Lost Time [s] | 1.4 | 1.4 | 1.8 | 1.4 | 1.4 | 0.0 | 1.4 | 1.4 | 0.0 | 1.8 | 1.8 | 1.4 |
| Minimum Recall | No | No | No | No | No | | No | No | | No | No | No |
| Maximum Recall | No | No | No | No | No | | No | No | | No | No | No |
| Pedestrian Recall | No | No | No | No | No | | No | No | | No | No | No |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

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**Lane Group Calculations**

| Lane Group | L | C | R | L | C | L | C | C | L | C | R |
|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 112 | 112 | 112 | 112 | 112 | 112 | 112 | 112 | 112 | 112 | 112 |
| L, Total Lost Time per Cycle [s] | 3.40 | 3.40 | 3.80 | 3.40 | 3.40 | 3.40 | 3.40 | 3.40 | 3.80 | 3.80 | 3.40 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 2.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 1.40 | 1.40 | 0.00 | 1.40 | 1.40 | 1.40 | 1.40 | 1.40 | 1.80 | 1.80 | 0.00 |
| g_i, Effective Green Time [s] | 10 | 10 | 33 | 18 | 18 | 5 | 50 | 50 | 20 | 65 | 95 |
| g / C, Green / Cycle | 0.09 | 0.09 | 0.29 | 0.16 | 0.16 | 0.04 | 0.45 | 0.45 | 0.17 | 0.58 | 0.85 |
| (v / s)_i Volume / Saturation Flow Rate | 0.03 | 0.05 | 0.08 | 0.13 | 0.13 | 0.02 | 0.18 | 0.18 | 0.16 | 0.24 | 0.14 |
| s, saturation flow rate [veh/h] | 1774 | 1863 | 1583 | 1774 | 1809 | 1412 | 1863 | 1840 | 1774 | 1863 | 1583 |
| c, Capacity [veh/h] | 159 | 167 | 467 | 289 | 295 | 105 | 834 | 824 | 310 | 1078 | 1345 |
| d1, Uniform Delay [s] | 47.73 | 49.10 | 30.19 | 45.24 | 45.24 | 53.84 | 20.92 | 20.92 | 42.18 | 6.39 | 0.00 |
| k, delay calibration | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.50 | 0.50 | 0.16 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 1.02 | 3.38 | 0.29 | 5.24 | 5.15 | 1.10 | 1.47 | 1.49 | 13.71 | 1.15 | 0.27 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.33 | 1.33 | 1.33 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.29 | 0.60 | 0.26 | 0.81 | 0.81 | 0.23 | 0.41 | 0.41 | 0.91 | 0.41 | 0.17 |
| d, Delay for Lane Group [s/veh] | 48.75 | 52.48 | 30.47 | 50.49 | 50.39 | 54.94 | 22.39 | 22.42 | 55.90 | 7.54 | 0.27 |
| Lane Group LOS | D | D | C | D | D | D | C | C | E | A | A |
| Critical Lane Group | No | No | Yes | Yes | No | No | No | Yes | Yes | No | No |
| 50th-Percentile Queue Length [veh/ln] | 1.26 | 2.82 | 2.49 | 6.57 | 6.69 | 0.70 | 6.27 | 6.20 | 8.25 | 3.05 | 0.10 |
| 50th-Percentile Queue Length [ft/ln] | 31.59 | 70.61 | 62.18 | 164.31 | 167.37 | 17.51 | 156.67 | 155.08 | 206.25 | 76.32 | 2.56 |
| 95th-Percentile Queue Length [veh/ln] | 2.27 | 5.08 | 4.48 | 10.78 | 10.94 | 1.26 | 10.37 | 10.29 | 12.96 | 5.50 | 0.18 |
| 95th-Percentile Queue Length [ft/ln] | 56.86 | 127.09 | 111.93 | 269.41 | 273.46 | 31.52 | 259.31 | 257.20 | 324.02 | 137.38 | 4.61 |



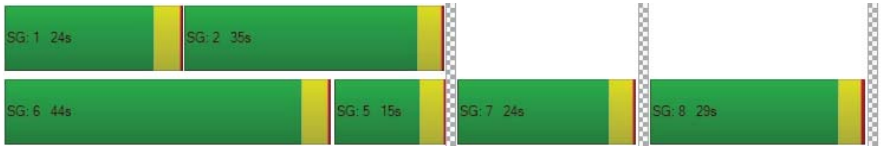
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**Movement, Approach, & Intersection Results**

| d_M, Delay for Movement [s/veh] | 48.75 | 52.48 | 30.47 | 50.46 | 50.39 | 50.39 | 54.94 | 22.40 | 22.42 | 55.90 | 7.54 | 0.27 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Movement LOS | D | D | C | D | D | D | D | C | C | E | A | A |
| d_A, Approach Delay [s/veh] | 41.93 | | | 50.44 | | | 23.52 | | | 20.13 | | |
| Approach LOS | D | | | D | | | C | | | C | | |
| d_I, Intersection Delay [s/veh] | 29.53 | | | | | | | | | | | |
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.598 | | | | | | | | | | | |

**Sequence**

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | 7 | 8 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |




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**Intersection Level Of Service Report**
**Intersection 2: US 101 SB Ramps/Old Redwood Hwy**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 23.2 |
| Analysis Method: | HCM 2010 | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.641 |

**Intersection Setup**

| Name | | | | US 101 SB Ramps | | | Old Redwood Hwy | | | Old Redwood Hwy | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | | | | | | | | | | | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Pocket | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 0 |
| Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 450.00 | 100.00 | 40.00 | 100.00 | 100.00 | 200.00 | 400.00 | 100.00 | 100.00 |
| Speed [mph] | | 30.00 | | | 35.00 | | | 35.00 | | | 35.00 | |
| Grade [%] | | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | |
| Crosswalk | | No | | | No | | | No | | | No | |

**Volumes**

| Name | | | | US 101 SB Ramps | | | Old Redwood Hwy | | | Old Redwood Hwy | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 0 | 0 | 0 | 115 | 0 | 84 | 1 | 741 | 432 | 565 | 872 | 0 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Rate | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right-Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 73 | 0 | 0 | 128 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 0 | 0 | 0 | 115 | 0 | 11 | 1 | 741 | 304 | 565 | 872 | 0 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 0.9500 | 0.9500 | 0.9500 | 1.0000 | 0.9500 | 0.9500 | 0.9500 | 0.9500 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 0 | 0 | 0 | 30 | 0 | 3 | 0 | 195 | 80 | 149 | 229 | 0 |
| Total Analysis Volume [veh/h] | 0 | 0 | 0 | 121 | 0 | 12 | 1 | 780 | 320 | 595 | 918 | 0 |
| Presence of On-Street Parking | | | | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pedestrian Volume [ped/h] | | 0 | | | 0 | | | 0 | | | 0 | |
| Bicycle Volume [bicycles/h] | | 0 | | | 0 | | | 0 | | | 0 | |



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**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | 1 - Central Windsor |
| Cycle Length [s] | 112 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 48.5 |
| Offset Reference | LeadGreen |
| Permissive Mode | SingleBand |
| Lost time [s] | 9.00 |

**Phasing & Timing**

| Control Type | Permiss | Protecte | Permiss | Split | Split | Split | Permiss | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal group | 0 | 0 | 0 | 0 | 8 | 0 | 0 | 6 | 0 | 5 | 2 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | - | - | - | - | - | - | Lead | - | - |
| Minimum Green [s] | 0 | 0 | 0 | 0 | 5 | 0 | 0 | 5 | 0 | 5 | 5 | 0 |
| Maximum Green [s] | 0 | 0 | 0 | 0 | 30 | 0 | 0 | 30 | 0 | 30 | 30 | 0 |
| Amber [s] | 0.0 | 0.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 0.0 | 0.0 | 0.0 | 0.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 0 | 0 | 0 | 0 | 11 | 0 | 0 | 52 | 0 | 49 | 101 | 0 |
| Vehicle Extension [s] | 0.0 | 0.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pedestrian Clearance [s] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Rest In Walk | | | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 0.0 | 0.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 0.0 | 0.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | | | | | No | | | No | | No | No | |
| Maximum Recall | | | | | No | | | No | | No | No | |
| Pedestrian Recall | | | | | No | | | No | | No | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

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AM Existing
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5/24/2018

**Lane Group Calculations**

| Lane Group | | L | C | R | C | R | L | C |
|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | | 112 | 112 | 112 | 112 | 112 | 112 | 112 |
| L, Total Lost Time per Cycle [s] | | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | | 6 | 6 | 6 | 55 | 55 | 40 | 98 |
| g / C, Green / Cycle | | 0.05 | 0.05 | 0.05 | 0.49 | 0.49 | 0.35 | 0.88 |
| (v / s)_i Volume / Saturation Flow Rate | | 0.03 | 0.03 | 0.01 | 0.22 | 0.20 | 0.34 | 0.26 |
| s, saturation flow rate [veh/h] | | 1774 | 1774 | 1583 | 3547 | 1583 | 1774 | 3547 |
| c, Capacity [veh/h] | | 91 | 91 | 81 | 1733 | 774 | 626 | 3112 |
| d1, Uniform Delay [s] | | 52.19 | 52.19 | 50.80 | 18.77 | 18.35 | 35.26 | 1.13 |
| k, delay calibration | | 0.11 | 0.11 | 0.11 | 0.50 | 0.50 | 0.34 | 0.50 |
| I, Upstream Filtering Factor | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | | 8.16 | 8.16 | 0.84 | 0.85 | 1.63 | 19.85 | 0.24 |
| d3, Initial Queue Delay [s] | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | | 0.67 | 0.67 | 0.15 | 0.45 | 0.41 | 0.95 | 0.29 |
| d, Delay for Lane Group [s/veh] | | 60.36 | 60.36 | 51.63 | 19.61 | 19.98 | 55.10 | 1.38 |
| Lane Group LOS | | E | E | D | B | B | E | A |
| Critical Lane Group | | Yes | No | No | Yes | No | Yes | No |
| 50th-Percentile Queue Length [veh/ln] | | 1.86 | 1.86 | 0.34 | 6.60 | 5.48 | 18.68 | 0.54 |
| 50th-Percentile Queue Length [ft/ln] | | 46.50 | 46.50 | 8.45 | 165.00 | 137.04 | 467.07 | 13.40 |
| 95th-Percentile Queue Length [veh/ln] | | 3.35 | 3.35 | 0.61 | 10.81 | 9.32 | 25.77 | 0.96 |
| 95th-Percentile Queue Length [ft/ln] | | 83.70 | 83.70 | 15.22 | 270.33 | 233.03 | 644.29 | 24.11 |



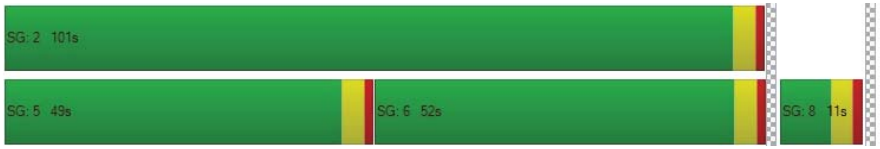
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**Movement, Approach, & Intersection Results**

| d_M, Delay for Movement [s/veh] | 0.00 | 0.00 | 0.00 | 60.36 | 60.36 | 51.63 | 0.00 | 19.61 | 19.98 | 55.10 | 1.38 | 0.00 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Movement LOS | | | | E | E | D | | B | B | E | A | |
| d_A, Approach Delay [s/veh] | 0.00 | | | 59.57 | | | 19.72 | | | 22.50 | | |
| Approach LOS | A | | | E | | | B | | | C | | |
| d_I, Intersection Delay [s/veh] | 23.18 | | | | | | | | | | | |
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.641 | | | | | | | | | | | |

**Sequence**

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | - | 2 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | 8 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |




Chevron TIS
AM Existing
W-Trans
5/24/2018

**Intersection Level Of Service Report**
**Intersection 3: Old Redwood Hwy/US 101 NB Ramp-Lakewood Dr**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 54.4 |
| Analysis Method: | HCM 2010 | Level Of Service: | D |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.831 |

**Intersection Setup**

| Name | US 101 NB Ramp | | | Lakewood Dr | | | Old Redwood Hwy | | | Old Redwood Hwy | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | | | | | | | | | | | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Pocket | 1 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pocket Length [ft] | 250.00 | 100.00 | 150.00 | 180.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| Speed [mph] | 35.00 | | | 35.00 | | | 35.00 | | | 35.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | No | | | No | | | No | | | No | | |

**Volumes**

| Name | US 101 NB Ramp | | | Lakewood Dr | | | Old Redwood Hwy | | | Old Redwood Hwy | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 281 | 273 | 98 | 248 | 0 | 647 | 297 | 511 | 0 | 0 | 755 | 205 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Rate | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right-Turn on Red Volume [veh/h] | 0 | 0 | 58 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 66 |
| Total Hourly Volume [veh/h] | 281 | 273 | 40 | 248 | 0 | 647 | 297 | 511 | 0 | 0 | 755 | 139 |
| Peak Hour Factor | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 1.0000 | 0.9000 | 0.9000 | 0.9000 | 1.0000 | 1.0000 | 0.9000 | 0.9000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 78 | 76 | 11 | 69 | 0 | 180 | 83 | 142 | 0 | 0 | 210 | 39 |
| Total Analysis Volume [veh/h] | 312 | 303 | 44 | 276 | 0 | 719 | 330 | 568 | 0 | 0 | 839 | 154 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |



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**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | 1 - Central Windsor |
| Cycle Length [s] | 112 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 112.0 |
| Offset Reference | LeadGreen |
| Permissive Mode | SingleBand |
| Lost time [s] | 12.00 |

**Phasing & Timing**

| Control Type | Split | Split | Split | Permiss | Protecte | Overlap | Protecte | Permiss | Permiss | Permiss | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal group | 0 | 7 | 0 | 8 | 0 | 1 | 1 | 6 | 0 | 0 | 2 | 0 |
| Auxiliary Signal Groups | | | | | | 1,8 | | | | | | |
| Lead / Lag | - | - | - | Lead | - | - | Lead | - | - | - | - | - |
| Minimum Green [s] | 0 | 5 | 0 | 5 | 0 | 5 | 5 | 5 | 0 | 0 | 5 | 0 |
| Maximum Green [s] | 0 | 30 | 0 | 30 | 0 | 30 | 30 | 30 | 0 | 0 | 30 | 0 |
| Amber [s] | 0.0 | 3.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 |
| All red [s] | 0.0 | 1.0 | 0.0 | 1.0 | 0.0 | 1.0 | 1.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 |
| Split [s] | 0 | 22 | 0 | 12 | 0 | 45 | 45 | 78 | 0 | 0 | 33 | 0 |
| Vehicle Extension [s] | 0.0 | 3.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pedestrian Clearance [s] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Rest In Walk | | No | | No | | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 0.0 | 2.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 0.0 | 2.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 |
| Minimum Recall | | No | | No | | No | No | No | | | No | |
| Maximum Recall | | No | | No | | No | No | No | | | No | |
| Pedestrian Recall | | No | | No | | No | No | No | | | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 50.0 | 0.0 | 50.0 | 0.0 | 50.0 | 50.0 | 50.0 | 0.0 | 0.0 | 50.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

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**Lane Group Calculations**

| Lane Group | L | C | C | L | R | L | C | C | C |
|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 112 | 112 | 112 | 112 | 112 | 112 | 112 | 112 | 112 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 0.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 16 | 16 | 16 | 9 | 55 | 41 | 74 | 29 | 29 |
| g / C, Green / Cycle | 0.15 | 0.15 | 0.15 | 0.08 | 0.49 | 0.37 | 0.66 | 0.26 | 0.26 |
| (v / s)_i Volume / Saturation Flow Rate | 0.13 | 0.13 | 0.13 | 0.08 | 0.45 | 0.10 | 0.30 | 0.27 | 0.28 |
| s, saturation flow rate [veh/h] | 1774 | 1828 | 1633 | 3445 | 1583 | 3445 | 1863 | 1863 | 1766 |
| c, Capacity [veh/h] | 261 | 269 | 240 | 289 | 771 | 1265 | 1233 | 482 | 457 |
| d1, Uniform Delay [s] | 46.63 | 46.61 | 46.62 | 49.52 | 18.01 | 24.80 | 9.21 | 41.51 | 41.51 |
| k, delay calibration | 0.11 | 0.11 | 0.11 | 0.11 | 0.50 | 0.50 | 0.50 | 0.45 | 0.49 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 7.96 | 7.62 | 8.52 | 15.79 | 19.61 | 0.50 | 1.24 | 46.56 | 66.77 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.33 | 1.33 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.86 | 0.85 | 0.86 | 0.95 | 0.93 | 0.26 | 0.46 | 1.03 | 1.09 |
| d, Delay for Lane Group [s/veh] | 54.59 | 54.23 | 55.14 | 65.32 | 37.62 | 25.30 | 10.46 | 88.07 | 108.28 |
| Lane Group LOS | D | D | E | E | D | C | B | F | F |
| Critical Lane Group | Yes | No | No | No | Yes | No | No | No | Yes |
| 50th-Percentile Queue Length [veh/ln] | 6.57 | 6.72 | 6.08 | 4.31 | 13.41 | 3.12 | 6.49 | 19.22 | 20.79 |
| 50th-Percentile Queue Length [ft/ln] | 164.32 | 168.11 | 152.04 | 107.86 | 335.27 | 77.90 | 162.33 | 480.42 | 519.66 |
| 95th-Percentile Queue Length [veh/ln] | 10.78 | 10.98 | 10.13 | 7.72 | 19.42 | 5.61 | 10.67 | 26.88 | 29.68 |
| 95th-Percentile Queue Length [ft/ln] | 269.43 | 274.43 | 253.15 | 193.01 | 485.41 | 140.21 | 266.80 | 672.09 | 742.08 |



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**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 54.48 | 54.71 | 55.14 | 65.32 | 0.00 | 37.62 | 25.30 | 10.46 | 0.00 | 0.00 | 96.32 | 108.28 |
| Movement LOS | D | D | E | E | | D | C | B | | | F | F |
| d_A, Approach Delay [s/veh] | 54.64 | | | 45.30 | | | 15.91 | | | 98.18 | | |
| Approach LOS | D | | | D | | | B | | | F | | |
| d_I, Intersection Delay [s/veh] | 54.40 | | | | | | | | | | | |
| Intersection LOS | D | | | | | | | | | | | |
| Intersection V/C | 0.831 | | | | | | | | | | | |

**Sequence**

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | - | 6 | 7 | 8 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |




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5/24/2018

**Intersection Level Of Service Report**
**Intersection 1: Old Redwood Hwy/Windsor River Rd**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 23.0 |
| Analysis Method: | HCM 2010 | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.551 |

**Intersection Setup**

| Name | Conde Ln | | | Old Redwood Hwy | | | Windsor River Rd | | | Old Redwood Hwy | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | | | | | | | | | | | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Pocket | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 0 |
| Pocket Length [ft] | 75.00 | 100.00 | 75.00 | 75.00 | 100.00 | 100.00 | 75.00 | 100.00 | 75.00 | 200.00 | 100.00 | 100.00 |
| Speed [mph] | 35.00 | | | 35.00 | | | 30.00 | | | 35.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | No | | | No | | | No | | | No | | |

**Volumes**

| Name | Conde Ln | | | Old Redwood Hwy | | | Windsor River Rd | | | Old Redwood Hwy | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 94 | 70 | 141 | 360 | 50 | 15 | 19 | 483 | 26 | 195 | 561 | 579 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Rate | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right-Turn on Red Volume [veh/h] | 0 | 0 | 65 | 0 | 0 | 18 | 0 | 0 | 7 | 0 | 0 | 66 |
| Total Hourly Volume [veh/h] | 94 | 70 | 76 | 360 | 50 | 0 | 19 | 483 | 19 | 195 | 561 | 513 |
| Peak Hour Factor | 0.9800 | 0.9800 | 0.9800 | 0.9800 | 0.9800 | 0.9800 | 0.9800 | 0.9800 | 0.9800 | 0.9800 | 0.9800 | 0.9800 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 24 | 18 | 19 | 92 | 13 | 0 | 5 | 123 | 5 | 50 | 143 | 131 |
| Total Analysis Volume [veh/h] | 96 | 71 | 78 | 367 | 51 | 0 | 19 | 493 | 19 | 199 | 572 | 523 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |



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**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | 1 - Central Windsor |
| Cycle Length [s] | 112 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 61.0 |
| Offset Reference | LeadGreen |
| Permissive Mode | SingleBand |
| Lost time [s] | 12.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Overlap | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Overlap |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal group | 8 | 8 | 1 | 7 | 7 | 0 | 5 | 2 | 0 | 1 | 6 | 7 |
| Auxiliary Signal Groups | | | 1,8 | | | | | | | | | 6,7 |
| Lead / Lag | Lag | - | - | Lead | - | - | Lag | - | - | Lead | - | - |
| Minimum Green [s] | 10 | 10 | 9 | 10 | 10 | 0 | 9 | 8 | 0 | 9 | 8 | 10 |
| Maximum Green [s] | 34 | 34 | 30 | 34 | 34 | 0 | 15 | 52 | 0 | 30 | 52 | 34 |
| Amber [s] | 3.2 | 3.2 | 3.6 | 3.2 | 3.2 | 0.0 | 3.2 | 3.2 | 0.0 | 3.6 | 3.6 | 3.2 |
| All red [s] | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.0 | 0.2 | 0.2 | 0.0 | 0.2 | 0.2 | 0.2 |
| Split [s] | 29 | 29 | 29 | 26 | 26 | 0 | 11 | 30 | 0 | 29 | 46 | 26 |
| Vehicle Extension [s] | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 3.0 |
| Walk [s] | 4 | 4 | 0 | 4 | 4 | 0 | 0 | 5 | 0 | 0 | 5 | 4 |
| Pedestrian Clearance [s] | 25 | 25 | 0 | 20 | 20 | 0 | 0 | 23 | 0 | 0 | 23 | 20 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 2.0 |
| I2, Clearance Lost Time [s] | 1.4 | 1.4 | 1.8 | 1.4 | 1.4 | 0.0 | 1.4 | 1.4 | 0.0 | 1.8 | 1.8 | 1.4 |
| Minimum Recall | No | No | No | No | No | | No | No | | No | No | No |
| Maximum Recall | No | No | No | No | No | | No | No | | No | No | No |
| Pedestrian Recall | No | No | No | No | No | | No | No | | No | No | No |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

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**Lane Group Calculations**

| Lane Group | L | C | R | L | C | L | C | C | L | C | R |
|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 112 | 112 | 112 | 112 | 112 | 112 | 112 | 112 | 112 | 112 | 112 |
| L, Total Lost Time per Cycle [s] | 3.40 | 3.40 | 3.80 | 3.40 | 3.40 | 3.40 | 3.40 | 3.40 | 3.80 | 3.80 | 3.40 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 2.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 1.40 | 1.40 | 0.00 | 1.40 | 1.40 | 1.40 | 1.40 | 1.40 | 1.80 | 1.80 | 0.00 |
| g_i, Effective Green Time [s] | 10 | 10 | 28 | 17 | 17 | 4 | 56 | 56 | 15 | 67 | 95 |
| g / C, Green / Cycle | 0.09 | 0.09 | 0.25 | 0.16 | 0.16 | 0.04 | 0.50 | 0.50 | 0.13 | 0.59 | 0.85 |
| (v / s)_i Volume / Saturation Flow Rate | 0.05 | 0.04 | 0.05 | 0.12 | 0.12 | 0.01 | 0.14 | 0.14 | 0.11 | 0.31 | 0.33 |
| s, saturation flow rate [veh/h] | 1774 | 1863 | 1583 | 1774 | 1795 | 1412 | 1863 | 1839 | 1774 | 1863 | 1583 |
| c, Capacity [veh/h] | 159 | 167 | 399 | 277 | 280 | 96 | 927 | 915 | 234 | 1103 | 1345 |
| d1, Uniform Delay [s] | 49.13 | 48.31 | 33.02 | 45.25 | 45.25 | 54.34 | 16.44 | 16.45 | 45.18 | 6.11 | 0.00 |
| k, delay calibration | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 3.62 | 1.70 | 0.24 | 4.07 | 4.02 | 1.00 | 0.75 | 0.76 | 8.45 | 1.74 | 0.85 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.33 | 1.33 | 1.33 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.60 | 0.42 | 0.20 | 0.75 | 0.75 | 0.20 | 0.28 | 0.28 | 0.85 | 0.52 | 0.39 |
| d, Delay for Lane Group [s/veh] | 52.75 | 50.01 | 33.26 | 49.32 | 49.27 | 55.34 | 17.19 | 17.21 | 53.63 | 7.85 | 0.85 |
| Lane Group LOS | D | D | C | D | D | E | B | B | D | A | A |
| Critical Lane Group | Yes | No | No | Yes | No | Yes | No | No | No | Yes | No |
| 50th-Percentile Queue Length [veh/ln] | 2.72 | 1.94 | 1.68 | 5.77 | 5.83 | 0.56 | 3.99 | 3.96 | 5.61 | 3.87 | 0.32 |
| 50th-Percentile Queue Length [ft/ln] | 68.05 | 48.55 | 42.10 | 144.23 | 145.78 | 13.94 | 99.85 | 98.92 | 140.29 | 96.67 | 7.93 |
| 95th-Percentile Queue Length [veh/ln] | 4.90 | 3.50 | 3.03 | 9.71 | 9.79 | 1.00 | 7.19 | 7.12 | 9.50 | 6.96 | 0.57 |
| 95th-Percentile Queue Length [ft/ln] | 122.48 | 87.39 | 75.78 | 242.70 | 244.79 | 25.10 | 179.72 | 178.06 | 237.42 | 174.01 | 14.27 |



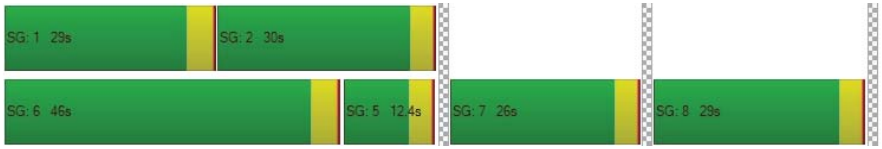
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**Movement, Approach, & Intersection Results**

| d_M, Delay for Movement [s/veh] | 52.75 | 50.01 | 33.26 | 49.30 | 49.27 | 49.27 | 55.34 | 17.20 | 17.21 | 53.63 | 7.85 | 0.85 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Movement LOS | D | D | C | D | D | D | E | B | B | D | A | A |
| d_A, Approach Delay [s/veh] | 45.75 | | | 49.30 | | | 18.56 | | | 12.06 | | |
| Approach LOS | D | | | D | | | B | | | B | | |
| d_I, Intersection Delay [s/veh] | 23.02 | | | | | | | | | | | |
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.551 | | | | | | | | | | | |

**Sequence**

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | 7 | 8 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |




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**Intersection Level Of Service Report**
**Intersection 2: US 101 SB Ramps/Old Redwood Hwy**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 20.4 |
| Analysis Method: | HCM 2010 | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.551 |

**Intersection Setup**

| Name | | | | US 101 SB Ramps | | | Old Redwood Hwy | | | Old Redwood Hwy | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | | | | | | | | | | | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Pocket | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 0 |
| Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 450.00 | 100.00 | 40.00 | 100.00 | 100.00 | 200.00 | 400.00 | 100.00 | 100.00 |
| Speed [mph] | 30.00 | | | 35.00 | | | 35.00 | | | 35.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | No | | | No | | | No | | | No | | |

**Volumes**

| Name | | | | US 101 SB Ramps | | | Old Redwood Hwy | | | Old Redwood Hwy | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 0 | 0 | 0 | 265 | 1 | 110 | 0 | 650 | 361 | 393 | 1060 | 0 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Rate | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right-Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 71 | 0 | 0 | 61 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 0 | 0 | 0 | 265 | 1 | 39 | 0 | 650 | 300 | 393 | 1060 | 0 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 0.9600 | 0.9600 | 0.9600 | 1.0000 | 0.9600 | 0.9600 | 0.9600 | 0.9600 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 0 | 0 | 0 | 69 | 0 | 10 | 0 | 169 | 78 | 102 | 276 | 0 |
| Total Analysis Volume [veh/h] | 0 | 0 | 0 | 276 | 1 | 41 | 0 | 677 | 313 | 409 | 1104 | 0 |
| Presence of On-Street Parking | | | | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |



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**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | 1 - Central Windsor |
| Cycle Length [s] | 112 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 48.5 |
| Offset Reference | LeadGreen |
| Permissive Mode | SingleBand |
| Lost time [s] | 9.00 |

**Phasing & Timing**

| Control Type | Permiss | Protecte | Permiss | Split | Split | Split | Permiss | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal group | 0 | 0 | 0 | 0 | 8 | 0 | 0 | 6 | 0 | 5 | 2 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | - | - | - | - | - | - | Lead | - | - |
| Minimum Green [s] | 0 | 0 | 0 | 0 | 5 | 0 | 0 | 5 | 0 | 5 | 5 | 0 |
| Maximum Green [s] | 0 | 0 | 0 | 0 | 30 | 0 | 0 | 30 | 0 | 30 | 30 | 0 |
| Amber [s] | 0.0 | 0.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 0.0 | 0.0 | 0.0 | 0.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 0 | 0 | 0 | 0 | 17 | 0 | 0 | 48 | 0 | 47 | 95 | 0 |
| Vehicle Extension [s] | 0.0 | 0.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pedestrian Clearance [s] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Rest In Walk | | | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 0.0 | 0.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 0.0 | 0.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | | | | | No | | | No | | No | No | |
| Maximum Recall | | | | | No | | | No | | No | No | |
| Pedestrian Recall | | | | | No | | | No | | No | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

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**Lane Group Calculations**

| Lane Group | | L | C | R | C | R | L | C |
|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | | 112 | 112 | 112 | 112 | 112 | 112 | 112 |
| L, Total Lost Time per Cycle [s] | | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | | 11 | 11 | 11 | 61 | 61 | 28 | 93 |
| g / C, Green / Cycle | | 0.10 | 0.10 | 0.10 | 0.55 | 0.55 | 0.25 | 0.83 |
| (v / s)_i Volume / Saturation Flow Rate | | 0.08 | 0.08 | 0.03 | 0.19 | 0.20 | 0.23 | 0.31 |
| s, saturation flow rate [veh/h] | | 1774 | 1775 | 1583 | 3547 | 1583 | 1774 | 3547 |
| c, Capacity [veh/h] | | 171 | 171 | 152 | 1937 | 865 | 444 | 2952 |
| d1, Uniform Delay [s] | | 49.60 | 49.60 | 46.94 | 14.25 | 14.37 | 40.89 | 2.29 |
| k, delay calibration | | 0.11 | 0.11 | 0.11 | 0.50 | 0.50 | 0.17 | 0.50 |
| I, Upstream Filtering Factor | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | | 8.83 | 8.83 | 0.94 | 0.50 | 1.18 | 11.74 | 0.36 |
| d3, Initial Queue Delay [s] | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | | 0.81 | 0.81 | 0.27 | 0.35 | 0.36 | 0.92 | 0.37 |
| d, Delay for Lane Group [s/veh] | | 58.43 | 58.43 | 47.88 | 14.75 | 15.55 | 52.63 | 2.65 |
| Lane Group LOS | | E | E | D | B | B | D | A |
| Critical Lane Group | | Yes | No | No | No | Yes | Yes | No |
| 50th-Percentile Queue Length [veh/ln] | | 4.17 | 4.18 | 1.09 | 4.74 | 4.58 | 12.19 | 1.84 |
| 50th-Percentile Queue Length [ft/ln] | | 104.37 | 104.40 | 27.30 | 118.48 | 114.42 | 304.72 | 45.91 |
| 95th-Percentile Queue Length [veh/ln] | | 7.51 | 7.52 | 1.97 | 8.31 | 8.09 | 17.91 | 3.31 |
| 95th-Percentile Queue Length [ft/ln] | | 187.87 | 187.92 | 49.14 | 207.74 | 202.13 | 447.87 | 82.63 |



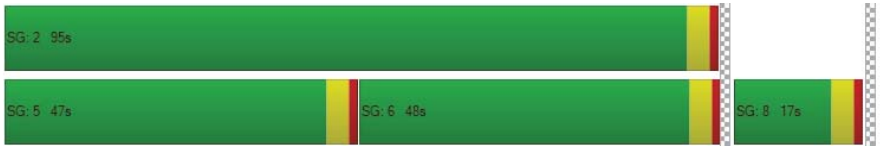
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**Movement, Approach, & Intersection Results**

| d_M, Delay for Movement [s/veh] | 0.00 | 0.00 | 0.00 | 58.43 | 58.43 | 47.88 | 0.00 | 14.75 | 15.55 | 52.63 | 2.65 | 0.00 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Movement LOS | | | | E | E | D | | B | B | D | A | |
| d_A, Approach Delay [s/veh] | 0.00 | | | 57.07 | | | 15.00 | | | 16.16 | | |
| Approach LOS | A | | | E | | | B | | | B | | |
| d_I, Intersection Delay [s/veh] | 20.37 | | | | | | | | | | | |
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.551 | | | | | | | | | | | |

**Sequence**

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | - | 2 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | 8 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |




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**Intersection Level Of Service Report**
**Intersection 3: Old Redwood Hwy/US 101 NB Ramp-Lakewood Dr**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 54.5 |
| Analysis Method: | HCM 2010 | Level Of Service: | D |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.810 |

**Intersection Setup**

| Name | US 101 NB Ramp | | | Lakewood Dr | | | Old Redwood Hwy | | | Old Redwood Hwy | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | | | | | | | | | | | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Pocket | 1 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pocket Length [ft] | 250.00 | 100.00 | 150.00 | 180.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| Speed [mph] | 35.00 | | | 35.00 | | | 35.00 | | | 35.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | No | | | No | | | No | | | No | | |

**Volumes**

| Name | US 101 NB Ramp | | | Lakewood Dr | | | Old Redwood Hwy | | | Old Redwood Hwy | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 465 | 534 | 234 | 366 | 0 | 661 | 334 | 489 | 0 | 0 | 572 | 303 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Rate | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right-Turn on Red Volume [veh/h] | 0 | 0 | 83 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 111 |
| Total Hourly Volume [veh/h] | 465 | 534 | 151 | 366 | 0 | 661 | 334 | 489 | 0 | 0 | 572 | 192 |
| Peak Hour Factor | 0.9900 | 0.9900 | 0.9900 | 0.9900 | 1.0000 | 0.9900 | 0.9900 | 0.9900 | 1.0000 | 1.0000 | 0.9900 | 0.9900 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 117 | 135 | 38 | 92 | 0 | 167 | 84 | 123 | 0 | 0 | 144 | 48 |
| Total Analysis Volume [veh/h] | 470 | 539 | 153 | 370 | 0 | 668 | 337 | 494 | 0 | 0 | 578 | 194 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |



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**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | 1 - Central Windsor |
| Cycle Length [s] | 112 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 112.0 |
| Offset Reference | LeadGreen |
| Permissive Mode | SingleBand |
| Lost time [s] | 12.00 |

**Phasing & Timing**

| Control Type | Split | Split | Split | Permiss | Protecte | Overlap | Protecte | Permiss | Permiss | Permiss | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal group | 0 | 7 | 0 | 8 | 0 | 1 | 1 | 6 | 0 | 0 | 2 | 0 |
| Auxiliary Signal Groups | | | | | | 1,8 | | | | | | |
| Lead / Lag | - | - | - | Lead | - | - | Lead | - | - | - | - | - |
| Minimum Green [s] | 0 | 5 | 0 | 5 | 0 | 5 | 5 | 5 | 0 | 0 | 5 | 0 |
| Maximum Green [s] | 0 | 30 | 0 | 30 | 0 | 30 | 30 | 30 | 0 | 0 | 30 | 0 |
| Amber [s] | 0.0 | 3.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 |
| All red [s] | 0.0 | 1.0 | 0.0 | 1.0 | 0.0 | 1.0 | 1.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 |
| Split [s] | 0 | 34 | 0 | 15 | 0 | 34 | 34 | 63 | 0 | 0 | 29 | 0 |
| Vehicle Extension [s] | 0.0 | 3.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pedestrian Clearance [s] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Rest In Walk | | No | | No | | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 0.0 | 2.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 0.0 | 2.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 |
| Minimum Recall | | No | | No | | No | No | No | | | No | |
| Maximum Recall | | No | | No | | No | No | No | | | No | |
| Pedestrian Recall | | No | | No | | No | No | No | | | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 50.0 | 0.0 | 50.0 | 0.0 | 50.0 | 50.0 | 50.0 | 0.0 | 0.0 | 50.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

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**Lane Group Calculations**

| Lane Group | L | C | C | L | R | L | C | C | C |
|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 112 | 112 | 112 | 112 | 112 | 112 | 112 | 112 | 112 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 0.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 28 | 28 | 28 | 13 | 47 | 30 | 59 | 25 | 25 |
| g / C, Green / Cycle | 0.25 | 0.25 | 0.25 | 0.11 | 0.42 | 0.27 | 0.53 | 0.22 | 0.22 |
| (v / s)_i Volume / Saturation Flow Rate | 0.22 | 0.22 | 0.22 | 0.11 | 0.42 | 0.10 | 0.27 | 0.21 | 0.23 |
| s, saturation flow rate [veh/h] | 1774 | 1846 | 1575 | 3445 | 1583 | 3445 | 1863 | 1863 | 1711 |
| c, Capacity [veh/h] | 446 | 465 | 396 | 387 | 662 | 931 | 986 | 416 | 382 |
| d1, Uniform Delay [s] | 40.47 | 40.46 | 40.48 | 47.41 | 24.81 | 33.11 | 16.93 | 42.70 | 43.57 |
| k, delay calibration | 0.33 | 0.33 | 0.33 | 0.11 | 0.50 | 0.50 | 0.50 | 0.29 | 0.34 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 16.18 | 15.50 | 17.90 | 13.10 | 37.15 | 1.09 | 1.82 | 19.85 | 40.47 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.33 | 1.33 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.89 | 0.89 | 0.89 | 0.96 | 1.01 | 0.36 | 0.50 | 0.93 | 1.01 |
| d, Delay for Lane Group [s/veh] | 56.65 | 55.95 | 58.38 | 60.52 | 61.96 | 34.21 | 18.75 | 62.55 | 84.05 |
| Lane Group LOS | E | E | E | E | F | C | B | E | F |
| Critical Lane Group | No | No | Yes | No | Yes | No | No | No | Yes |
| 50th-Percentile Queue Length [veh/ln] | 12.34 | 12.73 | 11.15 | 5.54 | 18.56 | 3.81 | 8.28 | 12.55 | 14.65 |
| 50th-Percentile Queue Length [ft/ln] | 308.38 | 318.26 | 278.71 | 138.55 | 464.03 | 95.20 | 206.95 | 313.86 | 366.35 |
| 95th-Percentile Queue Length [veh/ln] | 18.10 | 18.58 | 16.62 | 9.40 | 25.79 | 6.85 | 13.00 | 18.37 | 21.06 |
| 95th-Percentile Queue Length [ft/ln] | 452.38 | 464.55 | 415.60 | 235.07 | 644.75 | 171.37 | 324.92 | 459.14 | 526.53 |



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**Movement, Approach, & Intersection Results**

| d_M, Delay for Movement [s/veh] | 56.52 | 56.85 | 58.38 | 60.52 | 0.00 | 61.96 | 34.21 | 18.75 | 0.00 | 0.00 | 69.69 | 84.05 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Movement LOS | E | E | E | E | | F | C | B | | | E | F |
| d_A, Approach Delay [s/veh] | 56.93 | | | 61.45 | | | 25.02 | | | 73.30 | | |
| Approach LOS | E | | | E | | | C | | | E | | |
| d_I, Intersection Delay [s/veh] | 54.51 | | | | | | | | | | | |
| Intersection LOS | D | | | | | | | | | | | |
| Intersection V/C | 0.810 | | | | | | | | | | | |

**Sequence**

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | - | 6 | 7 | 8 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |




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5/24/2018

**Intersection Level Of Service Report**
**Intersection 1: Old Redwood Hwy/Windsor River Rd**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 36.4 |
| Analysis Method: | HCM 2010 | Level Of Service: | D |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.709 |

**Intersection Setup**

| Name | Conde Ln | | | Old Redwood Hwy | | | Windsor River Rd | | | Old Redwood Hwy | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | | | | | | | | | | | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Pocket | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 0 |
| Pocket Length [ft] | 75.00 | 100.00 | 75.00 | 200.00 | 100.00 | 100.00 | 75.00 | 100.00 | 75.00 | 200.00 | 100.00 | 100.00 |
| Speed [mph] | 35.00 | | | 35.00 | | | 30.00 | | | 35.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | No | | | No | | | No | | | No | | |

**Volumes**

| Name | Conde Ln | | | Old Redwood Hwy | | | Windsor River Rd | | | Old Redwood Hwy | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 32 | 86 | 309 | 528 | 121 | 16 | 26 | 622 | 36 | 223 | 411 | 197 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Rate | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right-Turn on Red Volume [veh/h] | 0 | 0 | 31 | 0 | 0 | 2 | 0 | 0 | 4 | 0 | 0 | 20 |
| Total Hourly Volume [veh/h] | 32 | 86 | 278 | 528 | 121 | 14 | 26 | 622 | 32 | 223 | 411 | 177 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 8 | 22 | 70 | 132 | 30 | 4 | 7 | 156 | 8 | 56 | 103 | 44 |
| Total Analysis Volume [veh/h] | 32 | 86 | 278 | 528 | 121 | 14 | 26 | 622 | 32 | 223 | 411 | 177 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |



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**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | 1 - Central Windsor |
| Cycle Length [s] | 112 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 20.0 |
| Offset Reference | LeadGreen |
| Permissive Mode | SingleBand |
| Lost time [s] | 12.00 |

**Phasing & Timing**

| Control Type | Split | Split | Overlap | Split | Split | Split | Protecte | Permiss | Permiss | Protecte | Permiss | Overlap |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal group | 8 | 8 | 1 | 7 | 7 | 0 | 5 | 2 | 0 | 1 | 6 | 7 |
| Auxiliary Signal Groups | | | 1,8 | | | | | | | | | 6,7 |
| Lead / Lag | Lag | - | - | Lead | - | - | Lag | - | - | Lead | - | - |
| Minimum Green [s] | 10 | 10 | 9 | 10 | 10 | 0 | 9 | 8 | 0 | 9 | 8 | 10 |
| Maximum Green [s] | 34 | 34 | 30 | 5 | 5 | 0 | 15 | 52 | 0 | 30 | 52 | 5 |
| Amber [s] | 3.2 | 3.2 | 3.6 | 3.2 | 3.2 | 0.0 | 3.2 | 3.2 | 0.0 | 3.6 | 3.6 | 3.2 |
| All red [s] | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.0 | 0.2 | 0.2 | 0.0 | 0.2 | 0.2 | 0.2 |
| Split [s] | 29 | 29 | 24 | 24 | 24 | 0 | 15 | 35 | 0 | 24 | 44 | 24 |
| Vehicle Extension [s] | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 3.0 |
| Walk [s] | 4 | 4 | 0 | 4 | 4 | 0 | 0 | 5 | 0 | 0 | 5 | 4 |
| Pedestrian Clearance [s] | 25 | 25 | 0 | 20 | 20 | 0 | 0 | 23 | 0 | 0 | 23 | 20 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 2.0 |
| I2, Clearance Lost Time [s] | 1.4 | 1.4 | 1.8 | 1.4 | 1.4 | 0.0 | 1.4 | 1.4 | 0.0 | 1.8 | 1.8 | 1.4 |
| Minimum Recall | | No | No | | Yes | | No | No | | No | No | Yes |
| Maximum Recall | | No | No | | No | | No | No | | No | No | No |
| Pedestrian Recall | | No | No | | No | | No | No | | No | No | No |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

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**Lane Group Calculations**

| Lane Group | L | C | R | L | C | L | C | C | L | C | R |
|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 112 | 112 | 112 | 112 | 112 | 112 | 112 | 112 | 112 | 112 | 112 |
| L, Total Lost Time per Cycle [s] | 3.40 | 3.40 | 3.80 | 3.40 | 3.40 | 3.40 | 3.40 | 3.40 | 3.80 | 3.80 | 3.40 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 2.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 1.40 | 1.40 | 0.00 | 1.40 | 1.40 | 1.40 | 1.40 | 1.40 | 1.80 | 1.80 | 0.00 |
| g_i, Effective Green Time [s] | 18 | 18 | 40 | 23 | 23 | 5 | 39 | 39 | 18 | 51 | 87 |
| g / C, Green / Cycle | 0.16 | 0.16 | 0.35 | 0.21 | 0.21 | 0.04 | 0.34 | 0.34 | 0.16 | 0.46 | 0.78 |
| (v / s)_i Volume / Saturation Flow Rate | 0.02 | 0.05 | 0.18 | 0.19 | 0.19 | 0.02 | 0.18 | 0.18 | 0.13 | 0.22 | 0.11 |
| s, saturation flow rate [veh/h] | 1774 | 1863 | 1583 | 1774 | 1796 | 1412 | 1863 | 1831 | 1774 | 1863 | 1583 |
| c, Capacity [veh/h] | 290 | 304 | 559 | 369 | 373 | 104 | 641 | 630 | 283 | 855 | 1229 |
| d1, Uniform Delay [s] | 39.93 | 41.11 | 28.43 | 43.16 | 43.14 | 53.92 | 29.26 | 29.27 | 42.32 | 14.40 | 0.00 |
| k, delay calibration | 0.11 | 0.11 | 0.20 | 0.29 | 0.29 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 0.17 | 0.50 | 1.27 | 17.30 | 16.94 | 1.25 | 2.93 | 2.99 | 4.87 | 1.93 | 0.25 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.33 | 1.33 | 1.33 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.11 | 0.28 | 0.50 | 0.89 | 0.89 | 0.25 | 0.51 | 0.51 | 0.79 | 0.48 | 0.14 |
| d, Delay for Lane Group [s/veh] | 40.09 | 41.61 | 29.70 | 60.46 | 60.09 | 55.16 | 32.19 | 32.26 | 47.19 | 16.34 | 0.25 |
| Lane Group LOS | D | D | C | E | E | E | C | C | D | B | A |
| Critical Lane Group | No | No | Yes | Yes | No | No | No | Yes | Yes | No | No |
| 50th-Percentile Queue Length [veh/ln] | 0.76 | 2.11 | 5.94 | 10.49 | 10.56 | 0.76 | 7.54 | 7.44 | 5.84 | 5.27 | 0.08 |
| 50th-Percentile Queue Length [ft/ln] | 19.01 | 52.74 | 148.42 | 262.15 | 264.04 | 19.02 | 188.56 | 185.92 | 145.98 | 131.87 | 2.10 |
| 95th-Percentile Queue Length [veh/ln] | 1.37 | 3.80 | 9.93 | 15.80 | 15.89 | 1.37 | 12.05 | 11.91 | 9.80 | 9.04 | 0.15 |
| 95th-Percentile Queue Length [ft/ln] | 34.22 | 94.92 | 248.31 | 394.92 | 397.28 | 34.24 | 301.16 | 297.73 | 245.05 | 226.03 | 3.78 |



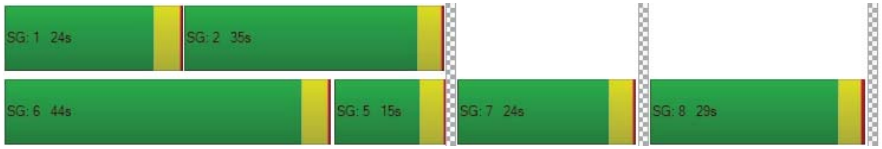
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**Movement, Approach, & Intersection Results**

| d_M, Delay for Movement [s/veh] | 40.09 | 41.61 | 29.70 | 60.32 | 60.09 | 60.09 | 55.16 | 32.22 | 32.26 | 47.19 | 16.34 | 0.25 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Movement LOS | D | D | C | E | E | E | E | C | C | D | B | A |
| d_A, Approach Delay [s/veh] | 33.13 | | | 60.27 | | | 33.10 | | | 21.31 | | |
| Approach LOS | C | | | E | | | C | | | C | | |
| d_I, Intersection Delay [s/veh] | 36.42 | | | | | | | | | | | |
| Intersection LOS | D | | | | | | | | | | | |
| Intersection V/C | 0.709 | | | | | | | | | | | |

**Sequence**

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | 7 | 8 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |




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W-Trans
5/25/2018

**Intersection Level Of Service Report**
**Intersection 2: US 101 SB Ramps/Old Redwood Hwy**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 28.1 |
| Analysis Method: | HCM 2010 | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.803 |

**Intersection Setup**

| Name | | | | US 101 SB Ramps | | | Old Redwood Hwy | | | Old Redwood Hwy | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | | | | | | | | | | | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Pocket | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 0 |
| Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 450.00 | 100.00 | 40.00 | 100.00 | 100.00 | 200.00 | 400.00 | 100.00 | 100.00 |
| Speed [mph] | | 30.00 | | | 35.00 | | | 35.00 | | | 35.00 | |
| Grade [%] | | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | |
| Crosswalk | | No | | | No | | | No | | | No | |

**Volumes**

| Name | | | | US 101 SB Ramps | | | Old Redwood Hwy | | | Old Redwood Hwy | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 0 | 0 | 0 | 157 | 0 | 144 | 1 | 699 | 814 | 559 | 742 | 0 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Rate | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right-Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 43 | 0 | 0 | 244 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 0 | 0 | 0 | 157 | 0 | 101 | 1 | 699 | 570 | 559 | 742 | 0 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 0 | 0 | 0 | 39 | 0 | 25 | 0 | 175 | 143 | 140 | 186 | 0 |
| Total Analysis Volume [veh/h] | 0 | 0 | 0 | 157 | 0 | 101 | 1 | 699 | 570 | 559 | 742 | 0 |
| Presence of On-Street Parking | | | | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pedestrian Volume [ped/h] | | 0 | | | 0 | | | 0 | | | 0 | |
| Bicycle Volume [bicycles/h] | | 0 | | | 0 | | | 0 | | | 0 | |



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**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | 1 - Central Windsor |
| Cycle Length [s] | 112 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 48.5 |
| Offset Reference | LeadGreen |
| Permissive Mode | SingleBand |
| Lost time [s] | 9.00 |

**Phasing & Timing**

| Control Type | Permiss | Protecte | Permiss | Split | Split | Split | Permiss | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal group | 0 | 0 | 0 | 0 | 8 | 0 | 0 | 6 | 0 | 5 | 2 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | - | - | - | - | - | - | Lead | - | - |
| Minimum Green [s] | 0 | 0 | 0 | 0 | 5 | 0 | 0 | 5 | 0 | 5 | 5 | 0 |
| Maximum Green [s] | 0 | 0 | 0 | 0 | 30 | 0 | 0 | 30 | 0 | 30 | 30 | 0 |
| Amber [s] | 0.0 | 0.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 0.0 | 0.0 | 0.0 | 0.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 0 | 0 | 0 | 0 | 11 | 0 | 0 | 52 | 0 | 49 | 101 | 0 |
| Vehicle Extension [s] | 0.0 | 0.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pedestrian Clearance [s] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Rest In Walk | | | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 0.0 | 0.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 0.0 | 0.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | | | | | No | | | No | | No | No | |
| Maximum Recall | | | | | No | | | No | | No | No | |
| Pedestrian Recall | | | | | No | | | No | | No | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

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**Lane Group Calculations**

| Lane Group | | L | C | R | C | R | L | C |
|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | | 112 | 112 | 112 | 112 | 112 | 112 | 112 |
| L, Total Lost Time per Cycle [s] | | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | | 7 | 7 | 7 | 56 | 56 | 37 | 97 |
| g / C, Green / Cycle | | 0.06 | 0.06 | 0.06 | 0.50 | 0.50 | 0.33 | 0.87 |
| (v / s)_i Volume / Saturation Flow Rate | | 0.04 | 0.04 | 0.06 | 0.20 | 0.36 | 0.32 | 0.21 |
| s, saturation flow rate [veh/h] | | 1774 | 1774 | 1583 | 3547 | 1583 | 1774 | 3547 |
| c, Capacity [veh/h] | | 112 | 112 | 100 | 1759 | 785 | 592 | 3070 |
| d1, Uniform Delay [s] | | 51.44 | 51.44 | 52.47 | 17.71 | 22.21 | 36.28 | 1.28 |
| k, delay calibration | | 0.11 | 0.11 | 0.11 | 0.50 | 0.50 | 0.30 | 0.50 |
| I, Upstream Filtering Factor | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | | 7.81 | 7.81 | 45.46 | 0.67 | 5.79 | 18.13 | 0.19 |
| d3, Initial Queue Delay [s] | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | | 0.70 | 0.70 | 1.01 | 0.40 | 0.73 | 0.94 | 0.24 |
| d, Delay for Lane Group [s/veh] | | 59.25 | 59.25 | 97.93 | 18.38 | 28.00 | 54.41 | 1.46 |
| Lane Group LOS | | E | E | F | B | C | D | A |
| Critical Lane Group | | No | No | Yes | No | Yes | Yes | No |
| 50th-Percentile Queue Length [veh/ln] | | 2.38 | 2.38 | 4.03 | 5.63 | 12.45 | 17.36 | 0.58 |
| 50th-Percentile Queue Length [ft/ln] | | 59.53 | 59.53 | 100.67 | 140.79 | 311.25 | 433.89 | 14.45 |
| 95th-Percentile Queue Length [veh/ln] | | 4.29 | 4.29 | 7.25 | 9.52 | 18.24 | 24.19 | 1.04 |
| 95th-Percentile Queue Length [ft/ln] | | 107.16 | 107.16 | 181.20 | 238.09 | 455.91 | 604.70 | 26.01 |



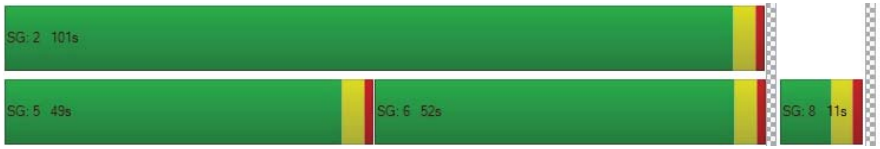
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**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 0.00 | 0.00 | 0.00 | 59.25 | 59.25 | 97.93 | 0.00 | 18.38 | 28.00 | 54.41 | 1.46 | 0.00 |
| Movement LOS | | | | E | E | F | | B | C | D | A | |
| d_A, Approach Delay [s/veh] | 0.00 | | | 74.39 | | | 22.70 | | | 24.21 | | |
| Approach LOS | A | | | E | | | C | | | C | | |
| d_I, Intersection Delay [s/veh] | 28.11 | | | | | | | | | | | |
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.803 | | | | | | | | | | | |

**Sequence**

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | - | 2 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | 8 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |




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**Intersection Level Of Service Report**
**Intersection 3: Old Redwood Hwy/US 101 NB Ramp-Lakewood Dr**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 32.9 |
| Analysis Method: | HCM 2010 | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.539 |

**Intersection Setup**

| Name | US 101 NB Ramp | | | Lakewood Dr | | | Old Redwood Hwy | | | Old Redwood Hwy | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | | | | | | | | | | | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Pocket | 1 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pocket Length [ft] | 250.00 | 100.00 | 150.00 | 180.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| Speed [mph] | 35.00 | | | 35.00 | | | 35.00 | | | 35.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | No | | | No | | | No | | | No | | |

**Volumes**

| Name | US 101 NB Ramp | | | Lakewood Dr | | | Old Redwood Hwy | | | Old Redwood Hwy | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 224 | 255 | 92 | 255 | 0 | 679 | 264 | 610 | 0 | 0 | 650 | 156 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Rate | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right-Turn on Red Volume [veh/h] | 0 | 0 | 28 | 0 | 0 | 204 | 0 | 0 | 0 | 0 | 0 | 47 |
| Total Hourly Volume [veh/h] | 224 | 255 | 64 | 255 | 0 | 475 | 264 | 610 | 0 | 0 | 650 | 109 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 56 | 64 | 16 | 64 | 0 | 119 | 66 | 153 | 0 | 0 | 163 | 27 |
| Total Analysis Volume [veh/h] | 224 | 255 | 64 | 255 | 0 | 475 | 264 | 610 | 0 | 0 | 650 | 109 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |



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**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | 1 - Central Windsor |
| Cycle Length [s] | 112 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 112.0 |
| Offset Reference | LeadGreen |
| Permissive Mode | SingleBand |
| Lost time [s] | 12.00 |

**Phasing & Timing**

| Control Type | Split | Split | Split | Permiss | Protecte | Overlap | Protecte | Permiss | Permiss | Permiss | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal group | 0 | 7 | 0 | 8 | 0 | 1 | 1 | 6 | 0 | 0 | 2 | 0 |
| Auxiliary Signal Groups | | | | | | 1,8 | | | | | | |
| Lead / Lag | - | - | - | Lead | - | - | Lead | - | - | - | - | - |
| Minimum Green [s] | 0 | 5 | 0 | 5 | 0 | 5 | 5 | 5 | 0 | 0 | 5 | 0 |
| Maximum Green [s] | 0 | 30 | 0 | 30 | 0 | 30 | 30 | 30 | 0 | 0 | 30 | 0 |
| Amber [s] | 0.0 | 3.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 |
| All red [s] | 0.0 | 1.0 | 0.0 | 1.0 | 0.0 | 1.0 | 1.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 |
| Split [s] | 0 | 22 | 0 | 12 | 0 | 29 | 29 | 78 | 0 | 0 | 49 | 0 |
| Vehicle Extension [s] | 0.0 | 3.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pedestrian Clearance [s] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Rest In Walk | | No | | No | | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 0.0 | 2.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 0.0 | 2.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 |
| Minimum Recall | | No | | No | | No | No | No | | | No | |
| Maximum Recall | | No | | No | | No | No | No | | | No | |
| Pedestrian Recall | | No | | No | | No | No | No | | | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 50.0 | 0.0 | 0.0 | 0.0 | 0.0 | 50.0 | 50.0 | 0.0 | 0.0 | 50.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

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**Lane Group Calculations**

| Lane Group | L | C | C | L | R | L | C | C | C |
|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 112 | 112 | 112 | 112 | 112 | 112 | 112 | 112 | 112 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 0.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 14 | 14 | 14 | 12 | 58 | 42 | 74 | 28 | 28 |
| g / C, Green / Cycle | 0.13 | 0.13 | 0.13 | 0.10 | 0.51 | 0.38 | 0.66 | 0.25 | 0.25 |
| (v / s)_i Volume / Saturation Flow Rate | 0.10 | 0.10 | 0.10 | 0.07 | 0.30 | 0.08 | 0.33 | 0.20 | 0.21 |
| s, saturation flow rate [veh/h] | 1774 | 1844 | 1587 | 3445 | 1583 | 3445 | 1863 | 1863 | 1773 |
| c, Capacity [veh/h] | 228 | 237 | 204 | 352 | 814 | 1297 | 1233 | 465 | 443 |
| d1, Uniform Delay [s] | 47.48 | 47.44 | 47.50 | 46.86 | 11.31 | 23.59 | 9.52 | 39.59 | 40.11 |
| k, delay calibration | 0.11 | 0.11 | 0.11 | 0.11 | 0.50 | 0.50 | 0.50 | 0.11 | 0.12 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 6.80 | 6.34 | 7.65 | 2.83 | 3.04 | 0.35 | 1.42 | 3.54 | 5.22 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.33 | 1.33 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.81 | 0.81 | 0.81 | 0.72 | 0.58 | 0.20 | 0.49 | 0.82 | 0.86 |
| d, Delay for Lane Group [s/veh] | 54.29 | 53.78 | 55.15 | 49.70 | 14.35 | 23.94 | 10.94 | 43.13 | 45.33 |
| Lane Group LOS | D | D | E | D | B | C | B | D | D |
| Critical Lane Group | No | No | Yes | No | Yes | No | No | No | Yes |
| 50th-Percentile Queue Length [veh/ln] | 5.40 | 5.54 | 4.90 | 3.41 | 5.26 | 2.39 | 7.22 | 10.10 | 10.41 |
| 50th-Percentile Queue Length [ft/ln] | 134.99 | 138.50 | 122.38 | 85.34 | 131.52 | 59.87 | 180.50 | 252.53 | 260.31 |
| 95th-Percentile Queue Length [veh/ln] | 9.21 | 9.40 | 8.52 | 6.14 | 9.02 | 4.31 | 11.63 | 15.31 | 15.70 |
| 95th-Percentile Queue Length [ft/ln] | 230.26 | 235.00 | 213.09 | 153.61 | 225.55 | 107.76 | 290.67 | 382.84 | 392.61 |



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**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 54.19 | 54.33 | 55.15 | 49.70 | 0.00 | 14.35 | 23.94 | 10.94 | 0.00 | 0.00 | 44.05 | 45.33 |
| Movement LOS | D | D | E | D | | B | C | B | | | D | D |
| d_A, Approach Delay [s/veh] | 54.37 | | | 26.70 | | | 14.87 | | | 44.23 | | |
| Approach LOS | D | | | C | | | B | | | D | | |
| d_I, Intersection Delay [s/veh] | 32.89 | | | | | | | | | | | |
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.539 | | | | | | | | | | | |

**Sequence**

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | - | 6 | 7 | 8 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |




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**Intersection Level Of Service Report**
**Intersection 1: Old Redwood Hwy/Windsor River Rd**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 27.1 |
| Analysis Method: | HCM 2010 | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.669 |

**Intersection Setup**

| Name | Conde Ln | | | Old Redwood Hwy | | | Windsor River Rd | | | Old Redwood Hwy | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | | | | | | | | | | | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Pocket | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 0 |
| Pocket Length [ft] | 75.00 | 100.00 | 75.00 | 200.00 | 100.00 | 100.00 | 75.00 | 100.00 | 75.00 | 200.00 | 100.00 | 100.00 |
| Speed [mph] | 35.00 | | | 35.00 | | | 30.00 | | | 35.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | No | | | No | | | No | | | No | | |

**Volumes**

| Name | Conde Ln | | | Old Redwood Hwy | | | Windsor River Rd | | | Old Redwood Hwy | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 44 | 83 | 217 | 319 | 72 | 24 | 28 | 562 | 29 | 278 | 675 | 341 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Rate | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right-Turn on Red Volume [veh/h] | 0 | 0 | 22 | 0 | 0 | 2 | 0 | 0 | 3 | 0 | 0 | 34 |
| Total Hourly Volume [veh/h] | 44 | 83 | 195 | 319 | 72 | 22 | 28 | 562 | 26 | 278 | 675 | 307 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 11 | 21 | 49 | 80 | 18 | 6 | 7 | 141 | 7 | 70 | 169 | 77 |
| Total Analysis Volume [veh/h] | 44 | 83 | 195 | 319 | 72 | 22 | 28 | 562 | 26 | 278 | 675 | 307 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |



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**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | 1 - Central Windsor |
| Cycle Length [s] | 112 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 61.0 |
| Offset Reference | LeadGreen |
| Permissive Mode | SingleBand |
| Lost time [s] | 12.00 |

**Phasing & Timing**

| Control Type | Split | Split | Overlap | Split | Split | Split | Protecte | Permiss | Permiss | Protecte | Permiss | Overlap |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal group | 3 | 8 | 1 | 7 | 7 | 0 | 5 | 2 | 0 | 1 | 6 | 7 |
| Auxiliary Signal Groups | | | 1,8 | | | | | | | | | 6,7 |
| Lead / Lag | - | - | - | Lead | - | - | Lag | - | - | Lead | - | - |
| Minimum Green [s] | 0 | 10 | 9 | 10 | 10 | 0 | 9 | 8 | 0 | 9 | 8 | 10 |
| Maximum Green [s] | 0 | 34 | 30 | 5 | 5 | 0 | 15 | 52 | 0 | 30 | 52 | 5 |
| Amber [s] | 0.0 | 3.2 | 3.6 | 3.2 | 3.2 | 0.0 | 3.2 | 3.2 | 0.0 | 3.6 | 3.6 | 3.2 |
| All red [s] | 0.0 | 0.2 | 0.2 | 0.2 | 0.2 | 0.0 | 0.2 | 0.2 | 0.0 | 0.2 | 0.2 | 0.2 |
| Split [s] | 0 | 29 | 29 | 26 | 26 | 0 | 11 | 30 | 0 | 29 | 46 | 26 |
| Vehicle Extension [s] | 0.0 | 3.0 | 3.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 3.0 |
| Walk [s] | 0 | 4 | 0 | 4 | 4 | 0 | 0 | 5 | 0 | 0 | 5 | 4 |
| Pedestrian Clearance [s] | 0 | 25 | 0 | 20 | 20 | 0 | 0 | 23 | 0 | 0 | 23 | 20 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 0.0 | 2.0 | 2.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 2.0 |
| I2, Clearance Lost Time [s] | 0.0 | 1.4 | 1.8 | 1.4 | 1.4 | 0.0 | 1.4 | 1.4 | 0.0 | 1.8 | 1.8 | 1.4 |
| Minimum Recall | | No | No | | Yes | | No | No | | No | No | Yes |
| Maximum Recall | | No | No | | No | | No | No | | No | No | No |
| Pedestrian Recall | | No | No | | No | | No | No | | No | No | No |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

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**Lane Group Calculations**

| Lane Group | L | C | R | L | C | L | C | C | L | C | R |
|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 112 | 112 | 112 | 112 | 112 | 112 | 112 | 112 | 112 | 112 | 112 |
| L, Total Lost Time per Cycle [s] | 3.40 | 3.40 | 3.80 | 3.40 | 3.40 | 3.40 | 3.40 | 3.40 | 3.80 | 3.80 | 3.40 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 2.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 1.40 | 1.40 | 0.00 | 1.40 | 1.40 | 1.40 | 1.40 | 1.40 | 1.80 | 1.80 | 0.00 |
| g_i, Effective Green Time [s] | 13 | 13 | 37 | 16 | 16 | 5 | 49 | 49 | 20 | 63 | 92 |
| g / C, Green / Cycle | 0.12 | 0.12 | 0.33 | 0.14 | 0.14 | 0.05 | 0.43 | 0.43 | 0.18 | 0.56 | 0.82 |
| (v / s)_i Volume / Saturation Flow Rate | 0.02 | 0.04 | 0.12 | 0.12 | 0.12 | 0.02 | 0.16 | 0.16 | 0.16 | 0.36 | 0.19 |
| s, saturation flow rate [veh/h] | 1774 | 1863 | 1583 | 1774 | 1781 | 1412 | 1863 | 1834 | 1774 | 1863 | 1583 |
| c, Capacity [veh/h] | 213 | 224 | 518 | 255 | 256 | 115 | 809 | 797 | 313 | 1047 | 1297 |
| d1, Uniform Delay [s] | 44.53 | 45.45 | 28.96 | 46.50 | 46.50 | 53.18 | 21.34 | 21.35 | 41.79 | 8.61 | 0.00 |
| k, delay calibration | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.50 | 0.50 | 0.15 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 0.47 | 1.02 | 0.45 | 5.95 | 5.93 | 1.08 | 1.28 | 1.30 | 11.05 | 3.06 | 0.43 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.33 | 1.33 | 1.33 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.21 | 0.37 | 0.38 | 0.81 | 0.81 | 0.24 | 0.37 | 0.37 | 0.89 | 0.64 | 0.24 |
| d, Delay for Lane Group [s/veh] | 45.00 | 46.47 | 29.41 | 52.45 | 52.43 | 54.26 | 22.62 | 22.65 | 52.84 | 11.67 | 0.43 |
| Lane Group LOS | D | D | C | D | D | D | C | C | D | B | A |
| Critical Lane Group | No | No | Yes | Yes | No | Yes | No | No | No | Yes | No |
| 50th-Percentile Queue Length [veh/ln] | 1.12 | 2.17 | 4.04 | 5.91 | 5.93 | 0.81 | 5.47 | 5.40 | 7.87 | 5.98 | 0.15 |
| 50th-Percentile Queue Length [ft/ln] | 28.11 | 54.35 | 100.94 | 147.74 | 148.24 | 20.26 | 136.68 | 135.01 | 196.85 | 149.51 | 3.87 |
| 95th-Percentile Queue Length [veh/ln] | 2.02 | 3.91 | 7.27 | 9.90 | 9.92 | 1.46 | 9.30 | 9.21 | 12.48 | 9.99 | 0.28 |
| 95th-Percentile Queue Length [ft/ln] | 50.59 | 97.84 | 181.69 | 247.41 | 248.08 | 36.48 | 232.54 | 230.29 | 311.90 | 249.77 | 6.97 |



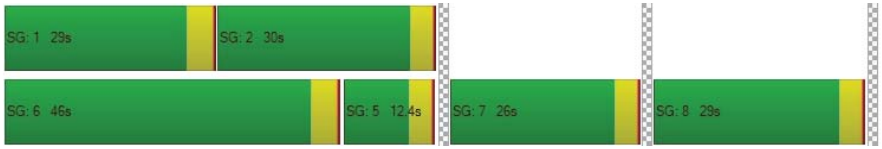
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**Movement, Approach, & Intersection Results**

| d_M, Delay for Movement [s/veh] | 45.00 | 46.47 | 29.41 | 52.44 | 52.43 | 52.43 | 54.26 | 22.63 | 22.65 | 52.84 | 11.67 | 0.43 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Movement LOS | D | D | C | D | D | D | D | C | C | D | B | A |
| d_A, Approach Delay [s/veh] | 35.94 | | | 52.44 | | | 24.07 | | | 18.01 | | |
| Approach LOS | D | | | D | | | C | | | B | | |
| d_I, Intersection Delay [s/veh] | 27.10 | | | | | | | | | | | |
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.669 | | | | | | | | | | | |

**Sequence**

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | 7 | 8 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |




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**Intersection Level Of Service Report**
**Intersection 2: US 101 SB Ramps/Old Redwood Hwy**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 23.4 |
| Analysis Method: | HCM 2010 | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.619 |

**Intersection Setup**

| Name | | | | US 101 SB Ramps | | | Old Redwood Hwy | | | Old Redwood Hwy | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | | | | | | | | | | | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Pocket | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 0 |
| Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 450.00 | 100.00 | 40.00 | 100.00 | 100.00 | 200.00 | 400.00 | 100.00 | 100.00 |
| Speed [mph] | 30.00 | | | 35.00 | | | 35.00 | | | 35.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | No | | | No | | | No | | | No | | |

**Volumes**

| Name | | | | US 101 SB Ramps | | | Old Redwood Hwy | | | Old Redwood Hwy | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 0 | 0 | 0 | 301 | 2 | 221 | 0 | 612 | 501 | 443 | 1121 | 0 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Rate | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right-Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 66 | 0 | 0 | 150 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 0 | 0 | 0 | 301 | 2 | 155 | 0 | 612 | 351 | 443 | 1121 | 0 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 0 | 0 | 0 | 75 | 1 | 39 | 0 | 153 | 88 | 111 | 280 | 0 |
| Total Analysis Volume [veh/h] | 0 | 0 | 0 | 301 | 2 | 155 | 0 | 612 | 351 | 443 | 1121 | 0 |
| Presence of On-Street Parking | | | | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |



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**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | 1 - Central Windsor |
| Cycle Length [s] | 112 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 48.5 |
| Offset Reference | LeadGreen |
| Permissive Mode | SingleBand |
| Lost time [s] | 9.00 |

**Phasing & Timing**

| Control Type | Permiss | Protecte | Permiss | Split | Split | Split | Permiss | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal group | 0 | 0 | 0 | 0 | 8 | 0 | 0 | 6 | 0 | 5 | 2 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | - | - | - | - | - | - | Lead | - | - |
| Minimum Green [s] | 0 | 0 | 0 | 0 | 5 | 0 | 0 | 5 | 0 | 5 | 5 | 0 |
| Maximum Green [s] | 0 | 0 | 0 | 0 | 30 | 0 | 0 | 30 | 0 | 30 | 30 | 0 |
| Amber [s] | 0.0 | 0.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 0.0 | 0.0 | 0.0 | 0.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 0 | 0 | 0 | 0 | 17 | 0 | 0 | 48 | 0 | 47 | 95 | 0 |
| Vehicle Extension [s] | 0.0 | 0.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pedestrian Clearance [s] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Rest In Walk | | | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 0.0 | 0.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 0.0 | 0.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | | | | | No | | | No | | No | No | |
| Maximum Recall | | | | | No | | | No | | No | No | |
| Pedestrian Recall | | | | | No | | | No | | No | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

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**Lane Group Calculations**

| Lane Group | | L | C | R | C | R | L | C |
|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | | 112 | 112 | 112 | 112 | 112 | 112 | 112 |
| L, Total Lost Time per Cycle [s] | | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | | 13 | 13 | 13 | 57 | 57 | 30 | 91 |
| g / C, Green / Cycle | | 0.11 | 0.11 | 0.11 | 0.51 | 0.51 | 0.27 | 0.81 |
| (v / s)_i Volume / Saturation Flow Rate | | 0.09 | 0.09 | 0.10 | 0.17 | 0.22 | 0.25 | 0.32 |
| s, saturation flow rate [veh/h] | | 1774 | 1775 | 1583 | 3547 | 1583 | 1774 | 3547 |
| c, Capacity [veh/h] | | 203 | 203 | 181 | 1805 | 806 | 478 | 2887 |
| d1, Uniform Delay [s] | | 47.99 | 47.99 | 48.66 | 16.31 | 17.34 | 39.83 | 2.83 |
| k, delay calibration | | 0.11 | 0.11 | 0.11 | 0.50 | 0.50 | 0.20 | 0.50 |
| I, Upstream Filtering Factor | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | | 5.36 | 5.36 | 10.85 | 0.51 | 1.71 | 13.73 | 0.40 |
| d3, Initial Queue Delay [s] | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | | 0.75 | 0.75 | 0.86 | 0.34 | 0.44 | 0.93 | 0.39 |
| d, Delay for Lane Group [s/veh] | | 53.36 | 53.35 | 59.51 | 16.82 | 19.05 | 53.57 | 3.23 |
| Lane Group LOS | | D | D | E | B | B | D | A |
| Critical Lane Group | | No | No | Yes | No | Yes | Yes | No |
| 50th-Percentile Queue Length [veh/ln] | | 4.35 | 4.35 | 4.75 | 4.63 | 5.87 | 13.40 | 2.35 |
| 50th-Percentile Queue Length [ft/ln] | | 108.73 | 108.79 | 118.63 | 115.64 | 146.69 | 335.08 | 58.65 |
| 95th-Percentile Queue Length [veh/ln] | | 7.77 | 7.77 | 8.32 | 8.15 | 9.84 | 19.41 | 4.22 |
| 95th-Percentile Queue Length [ft/ln] | | 194.23 | 194.32 | 207.94 | 203.82 | 246.01 | 485.18 | 105.57 |



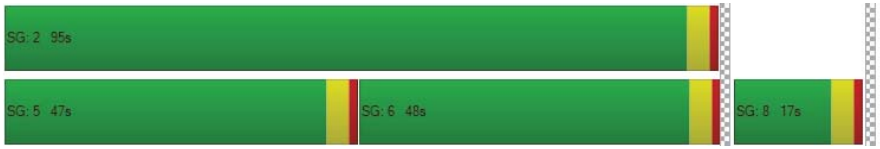
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**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 0.00 | 0.00 | 0.00 | 53.36 | 53.35 | 59.51 | 0.00 | 16.82 | 19.05 | 53.57 | 3.23 | 0.00 |
| Movement LOS | | | | D | D | E | | B | B | D | A | |
| d_A, Approach Delay [s/veh] | 0.00 | | | 55.44 | | | 17.63 | | | 17.48 | | |
| Approach LOS | A | | | E | | | B | | | B | | |
| d_I, Intersection Delay [s/veh] | 23.36 | | | | | | | | | | | |
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.619 | | | | | | | | | | | |

**Sequence**

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | - | 2 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | 8 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |




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## Intersection Level Of Service Report
## Intersection 3: Old Redwood Hwy/US 101 NB Ramp-Lakewood Dr

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 57.1 |
| Analysis Method: | HCM 2010 | Level Of Service: | E |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.725 |

**Intersection Setup**

| Name | US 101 NB Ramp | | | Lakewood Dr | | | Old Redwood Hwy | | | Old Redwood Hwy | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | | | | | | | | | | | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Pocket | 1 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pocket Length [ft] | 250.00 | 100.00 | 150.00 | 180.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| Speed [mph] | 35.00 | | | 35.00 | | | 35.00 | | | 35.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | No | | | No | | | No | | | No | | |

**Volumes**

| Name | US 101 NB Ramp | | | Lakewood Dr | | | Old Redwood Hwy | | | Old Redwood Hwy | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 528 | 539 | 303 | 386 | 0 | 618 | 309 | 672 | 0 | 0 | 715 | 270 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Rate | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right-Turn on Red Volume [veh/h] | 0 | 0 | 91 | 0 | 0 | 185 | 0 | 0 | 0 | 0 | 0 | 81 |
| Total Hourly Volume [veh/h] | 528 | 539 | 212 | 386 | 0 | 433 | 309 | 672 | 0 | 0 | 715 | 189 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 132 | 135 | 53 | 97 | 0 | 108 | 77 | 168 | 0 | 0 | 179 | 47 |
| Total Analysis Volume [veh/h] | 528 | 539 | 212 | 386 | 0 | 433 | 309 | 672 | 0 | 0 | 715 | 189 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |



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**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | 1 - Central Windsor |
| Cycle Length [s] | 112 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 112.0 |
| Offset Reference | LeadGreen |
| Permissive Mode | SingleBand |
| Lost time [s] | 12.00 |

**Phasing & Timing**

| Control Type | Split | Split | Split | Permiss | Protecte | Overlap | Protecte | Permiss | Permiss | Permiss | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal group | 0 | 7 | 0 | 8 | 0 | 1 | 1 | 6 | 0 | 0 | 2 | 0 |
| Auxiliary Signal Groups | | | | | | 1,8 | | | | | | |
| Lead / Lag | - | - | - | Lead | - | - | Lead | - | - | - | - | - |
| Minimum Green [s] | 0 | 5 | 0 | 5 | 0 | 5 | 5 | 5 | 0 | 0 | 5 | 0 |
| Maximum Green [s] | 0 | 30 | 0 | 30 | 0 | 30 | 30 | 30 | 0 | 0 | 30 | 0 |
| Amber [s] | 0.0 | 3.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 |
| All red [s] | 0.0 | 1.0 | 0.0 | 1.0 | 0.0 | 1.0 | 1.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 |
| Split [s] | 0 | 34 | 0 | 15 | 0 | 29 | 29 | 63 | 0 | 0 | 34 | 0 |
| Vehicle Extension [s] | 0.0 | 3.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pedestrian Clearance [s] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Rest In Walk | | No | | No | | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 0.0 | 2.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 0.0 | 2.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 |
| Minimum Recall | | No | | No | | No | No | No | | | No | |
| Maximum Recall | | No | | No | | No | No | No | | | No | |
| Pedestrian Recall | | No | | No | | No | No | No | | | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 50.0 | 0.0 | 0.0 | 0.0 | 0.0 | 50.0 | 50.0 | 0.0 | 0.0 | 50.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

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**Lane Group Calculations**

| Lane Group | L | C | C | L | R | L | C | C | C |
|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 112 | 112 | 112 | 112 | 112 | 112 | 112 | 112 | 112 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 0.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 30 | 30 | 30 | 11 | 40 | 25 | 59 | 30 | 30 |
| g / C, Green / Cycle | 0.27 | 0.27 | 0.27 | 0.10 | 0.36 | 0.22 | 0.53 | 0.27 | 0.27 |
| (v / s)_i Volume / Saturation Flow Rate | 0.25 | 0.25 | 0.25 | 0.11 | 0.27 | 0.09 | 0.36 | 0.24 | 0.26 |
| s, saturation flow rate [veh/h] | 1774 | 1845 | 1545 | 3445 | 1583 | 3445 | 1863 | 1863 | 1735 |
| c, Capacity [veh/h] | 471 | 490 | 410 | 345 | 570 | 772 | 982 | 499 | 464 |
| d1, Uniform Delay [s] | 40.19 | 40.14 | 40.24 | 48.57 | 25.20 | 37.08 | 19.59 | 39.69 | 40.65 |
| k, delay calibration | 0.40 | 0.39 | 0.40 | 0.11 | 0.50 | 0.50 | 0.50 | 0.38 | 0.43 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 23.60 | 22.34 | 26.72 | 62.73 | 9.23 | 1.55 | 3.87 | 18.59 | 32.80 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.33 | 1.33 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.93 | 0.93 | 0.94 | 1.12 | 0.76 | 0.40 | 0.68 | 0.91 | 0.97 |
| d, Delay for Lane Group [s/veh] | 63.79 | 62.47 | 66.96 | 111.30 | 34.43 | 38.63 | 23.46 | 58.29 | 73.45 |
| Lane Group LOS | E | E | E | F | C | D | C | E | E |
| Critical Lane Group | No | No | Yes | No | Yes | No | No | No | Yes |
| 50th-Percentile Queue Length [veh/ln] | 14.63 | 14.98 | 13.15 | 7.58 | 9.23 | 3.74 | 13.25 | 14.32 | 16.26 |
| 50th-Percentile Queue Length [ft/ln] | 365.68 | 374.46 | 328.65 | 189.47 | 230.86 | 93.46 | 331.34 | 358.01 | 406.50 |
| 95th-Percentile Queue Length [veh/ln] | 20.90 | 21.33 | 19.09 | 12.60 | 14.22 | 6.73 | 19.22 | 20.53 | 22.87 |
| 95th-Percentile Queue Length [ft/ln] | 522.49 | 533.14 | 477.31 | 315.06 | 355.45 | 168.23 | 480.60 | 513.16 | 571.83 |



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**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 63.53 | 63.91 | 66.96 | 111.30 | 0.00 | 34.43 | 38.63 | 23.46 | 0.00 | 0.00 | 63.87 | 73.45 |
| Movement LOS | E | E | E | F | | C | D | C | | | E | E |
| d_A, Approach Delay [s/veh] | 64.27 | | | 70.66 | | | 28.24 | | | 65.87 | | |
| Approach LOS | E | | | E | | | C | | | E | | |
| d_I, Intersection Delay [s/veh] | 57.07 | | | | | | | | | | | |
| Intersection LOS | E | | | | | | | | | | | |
| Intersection V/C | 0.725 | | | | | | | | | | | |

**Sequence**

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | - | 6 | 7 | 8 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |




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**Intersection Level Of Service Report**
**Intersection 16: Old Redwood Hwy/Windsor River Rd**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 30.1 |
| Analysis Method: | HCM 2010 | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.621 |

**Intersection Setup**

| Name | Conde Ln | | | Old Redwood Hwy | | | Windsor River Rd | | | Old Redwood Hwy | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | | | | | | | | | | | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Pocket | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 0 |
| Pocket Length [ft] | 75.00 | 100.00 | 75.00 | 75.00 | 100.00 | 100.00 | 75.00 | 100.00 | 75.00 | 200.00 | 100.00 | 100.00 |
| Speed [mph] | 35.00 | | | 35.00 | | | 30.00 | | | 35.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | No | | | No | | | No | | | No | | |

**Volumes**

| Name | Conde Ln | | | Old Redwood Hwy | | | Windsor River Rd | | | Old Redwood Hwy | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 43 | 92 | 239 | 314 | 110 | 8 | 22 | 600 | 31 | 259 | 405 | 270 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Rate | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 4 | 0 | 58 | 4 | 7 | 7 | 0 | 0 | 0 | 0 | 58 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right-Turn on Red Volume [veh/h] | 0 | 0 | 129 | 0 | 0 | 0 | 0 | 0 | 10 | 0 | 0 | 59 |
| Total Hourly Volume [veh/h] | 43 | 96 | 110 | 372 | 114 | 15 | 29 | 600 | 21 | 259 | 405 | 269 |
| Peak Hour Factor | 0.9200 | 0.9200 | 0.9200 | 0.9200 | 0.9200 | 0.9200 | 0.9200 | 0.9200 | 0.9200 | 0.9200 | 0.9200 | 0.9200 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 12 | 26 | 30 | 101 | 31 | 4 | 8 | 163 | 6 | 70 | 110 | 73 |
| Total Analysis Volume [veh/h] | 47 | 104 | 120 | 404 | 124 | 16 | 32 | 652 | 23 | 282 | 440 | 292 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |



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**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | 1 - Central Windsor |
| Cycle Length [s] | 112 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 20.0 |
| Offset Reference | LeadGreen |
| Permissive Mode | SingleBand |
| Lost time [s] | 12.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Overlap | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Overlap |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal group | 8 | 8 | 1 | 7 | 7 | 0 | 5 | 2 | 0 | 1 | 6 | 7 |
| Auxiliary Signal Groups | | | 1,8 | | | | | | | | | 6,7 |
| Lead / Lag | Lag | - | - | Lead | - | - | Lag | - | - | Lead | - | - |
| Minimum Green [s] | 10 | 10 | 9 | 10 | 10 | 0 | 9 | 8 | 0 | 9 | 8 | 10 |
| Maximum Green [s] | 34 | 34 | 30 | 34 | 34 | 0 | 15 | 52 | 0 | 30 | 52 | 34 |
| Amber [s] | 3.2 | 3.2 | 3.6 | 3.2 | 3.2 | 0.0 | 3.2 | 3.2 | 0.0 | 3.6 | 3.6 | 3.2 |
| All red [s] | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.0 | 0.2 | 0.2 | 0.0 | 0.2 | 0.2 | 0.2 |
| Split [s] | 29 | 29 | 24 | 24 | 24 | 0 | 15 | 35 | 0 | 24 | 44 | 24 |
| Vehicle Extension [s] | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 3.0 |
| Walk [s] | 4 | 4 | 0 | 4 | 4 | 0 | 0 | 5 | 0 | 0 | 5 | 4 |
| Pedestrian Clearance [s] | 25 | 25 | 0 | 20 | 20 | 0 | 0 | 23 | 0 | 0 | 23 | 20 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 2.0 |
| I2, Clearance Lost Time [s] | 1.4 | 1.4 | 1.8 | 1.4 | 1.4 | 0.0 | 1.4 | 1.4 | 0.0 | 1.8 | 1.8 | 1.4 |
| Minimum Recall | No | No | No | No | No | | No | No | | No | No | No |
| Maximum Recall | No | No | No | No | No | | No | No | | No | No | No |
| Pedestrian Recall | No | No | No | No | No | | No | No | | No | No | No |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

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**Lane Group Calculations**

| Lane Group | L | C | R | L | C | L | C | C | L | C | R |
|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 112 | 112 | 112 | 112 | 112 | 112 | 112 | 112 | 112 | 112 | 112 |
| L, Total Lost Time per Cycle [s] | 3.40 | 3.40 | 3.80 | 3.40 | 3.40 | 3.40 | 3.40 | 3.40 | 3.80 | 3.80 | 3.40 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 2.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 1.40 | 1.40 | 0.00 | 1.40 | 1.40 | 1.40 | 1.40 | 1.40 | 1.80 | 1.80 | 0.00 |
| g_i, Effective Green Time [s] | 10 | 10 | 33 | 21 | 21 | 6 | 48 | 48 | 20 | 62 | 95 |
| g / C, Green / Cycle | 0.09 | 0.09 | 0.29 | 0.18 | 0.18 | 0.05 | 0.43 | 0.43 | 0.17 | 0.55 | 0.85 |
| (v / s)_i Volume / Saturation Flow Rate | 0.03 | 0.06 | 0.08 | 0.15 | 0.15 | 0.02 | 0.18 | 0.18 | 0.16 | 0.24 | 0.18 |
| s, saturation flow rate [veh/h] | 1774 | 1863 | 1583 | 1774 | 1800 | 1412 | 1863 | 1840 | 1774 | 1863 | 1583 |
| c, Capacity [veh/h] | 159 | 167 | 467 | 326 | 331 | 117 | 795 | 786 | 310 | 1024 | 1345 |
| d1, Uniform Delay [s] | 47.73 | 49.22 | 30.19 | 44.08 | 44.07 | 53.21 | 22.54 | 22.54 | 42.18 | 8.13 | 0.00 |
| k, delay calibration | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.50 | 0.50 | 0.16 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 1.02 | 3.72 | 0.29 | 5.36 | 5.28 | 1.26 | 1.68 | 1.70 | 13.71 | 1.32 | 0.37 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.33 | 1.33 | 1.33 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.29 | 0.62 | 0.26 | 0.83 | 0.83 | 0.27 | 0.43 | 0.43 | 0.91 | 0.43 | 0.22 |
| d, Delay for Lane Group [s/veh] | 48.75 | 52.94 | 30.47 | 49.44 | 49.36 | 54.47 | 24.21 | 24.24 | 55.90 | 9.45 | 0.37 |
| Lane Group LOS | D | D | C | D | D | D | C | C | E | A | A |
| Critical Lane Group | No | No | Yes | Yes | No | No | No | Yes | Yes | No | No |
| 50th-Percentile Queue Length [veh/ln] | 1.26 | 2.95 | 2.49 | 7.59 | 7.70 | 0.93 | 6.57 | 6.50 | 8.25 | 3.67 | 0.14 |
| 50th-Percentile Queue Length [ft/ln] | 31.59 | 73.83 | 62.18 | 189.82 | 192.39 | 23.21 | 164.21 | 162.54 | 206.25 | 91.66 | 3.46 |
| 95th-Percentile Queue Length [veh/ln] | 2.27 | 5.32 | 4.48 | 12.11 | 12.25 | 1.67 | 10.77 | 10.68 | 12.96 | 6.60 | 0.25 |
| 95th-Percentile Queue Length [ft/ln] | 56.86 | 132.90 | 111.93 | 302.79 | 306.13 | 41.78 | 269.28 | 267.08 | 324.02 | 164.99 | 6.23 |



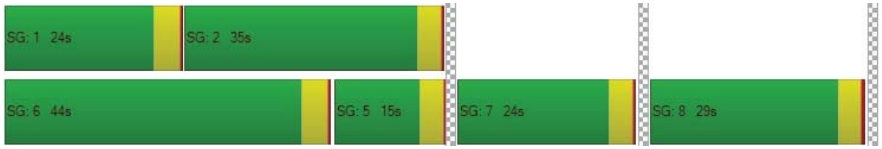
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**Movement, Approach, & Intersection Results**

| d_M, Delay for Movement [s/veh] | 48.75 | 52.94 | 30.47 | 49.41 | 49.36 | 49.36 | 54.47 | 24.23 | 24.24 | 55.90 | 9.45 | 0.37 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Movement LOS | D | D | C | D | D | D | D | C | C | E | A | A |
| d_A, Approach Delay [s/veh] | 42.26 | | | 49.40 | | | 25.59 | | | 19.75 | | |
| Approach LOS | D | | | D | | | C | | | B | | |
| d_I, Intersection Delay [s/veh] | 30.15 | | | | | | | | | | | |
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.621 | | | | | | | | | | | |

**Sequence**

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | 7 | 8 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |




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W-Trans
5/29/2018

**Intersection Level Of Service Report**
**Intersection 17: US 101 SB Ramps/Old Redwood Hwy**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 23.1 |
| Analysis Method: | HCM 2010 | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.653 |

**Intersection Setup**

| Name | | | | US 101 SB Ramps | | | Old Redwood Hwy | | | Old Redwood Hwy | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | | | | | | | | | | | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Pocket | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 0 |
| Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 450.00 | 100.00 | 40.00 | 100.00 | 100.00 | 200.00 | 400.00 | 100.00 | 100.00 |
| Speed [mph] | | 30.00 | | | 35.00 | | | 35.00 | | | 35.00 | |
| Grade [%] | | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | |
| Crosswalk | | No | | | No | | | No | | | No | |

**Volumes**

| Name | | | | US 101 SB Ramps | | | Old Redwood Hwy | | | Old Redwood Hwy | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 0 | 0 | 0 | 115 | 0 | 84 | 1 | 741 | 432 | 565 | 872 | 0 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Rate | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 14 | 0 | 36 | 22 | 0 | 44 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right-Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 73 | 0 | 0 | 128 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 0 | 0 | 0 | 115 | 0 | 25 | 1 | 777 | 326 | 565 | 916 | 0 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 0.9500 | 0.9500 | 0.9500 | 1.0000 | 0.9500 | 0.9500 | 0.9500 | 0.9500 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 0 | 0 | 0 | 30 | 0 | 7 | 0 | 204 | 86 | 149 | 241 | 0 |
| Total Analysis Volume [veh/h] | 0 | 0 | 0 | 121 | 0 | 26 | 1 | 818 | 343 | 595 | 964 | 0 |
| Presence of On-Street Parking | | | | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pedestrian Volume [ped/h] | | 0 | | | 0 | | | 0 | | | 0 | |
| Bicycle Volume [bicycles/h] | | 0 | | | 0 | | | 0 | | | 0 | |



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**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | 1 - Central Windsor |
| Cycle Length [s] | 112 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 48.5 |
| Offset Reference | LeadGreen |
| Permissive Mode | SingleBand |
| Lost time [s] | 9.00 |

**Phasing & Timing**

| Control Type | Permiss | Protecte | Permiss | Split | Split | Split | Permiss | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal group | 0 | 0 | 0 | 0 | 8 | 0 | 0 | 6 | 0 | 5 | 2 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | - | - | - | - | - | - | Lead | - | - |
| Minimum Green [s] | 0 | 0 | 0 | 0 | 5 | 0 | 0 | 5 | 0 | 5 | 5 | 0 |
| Maximum Green [s] | 0 | 0 | 0 | 0 | 30 | 0 | 0 | 30 | 0 | 30 | 30 | 0 |
| Amber [s] | 0.0 | 0.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 0.0 | 0.0 | 0.0 | 0.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 0 | 0 | 0 | 0 | 11 | 0 | 0 | 52 | 0 | 49 | 101 | 0 |
| Vehicle Extension [s] | 0.0 | 0.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pedestrian Clearance [s] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Rest In Walk | | | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 0.0 | 0.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 0.0 | 0.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | | | | | No | | | No | | No | No | |
| Maximum Recall | | | | | No | | | No | | No | No | |
| Pedestrian Recall | | | | | No | | | No | | No | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

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**Lane Group Calculations**

| Lane Group | | L | C | R | C | R | L | C |
|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | | 112 | 112 | 112 | 112 | 112 | 112 | 112 |
| L, Total Lost Time per Cycle [s] | | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | | 6 | 6 | 6 | 55 | 55 | 40 | 98 |
| g / C, Green / Cycle | | 0.05 | 0.05 | 0.05 | 0.49 | 0.49 | 0.35 | 0.88 |
| (v / s)_i Volume / Saturation Flow Rate | | 0.03 | 0.03 | 0.02 | 0.23 | 0.22 | 0.34 | 0.27 |
| s, saturation flow rate [veh/h] | | 1774 | 1774 | 1583 | 3547 | 1583 | 1774 | 3547 |
| c, Capacity [veh/h] | | 91 | 91 | 81 | 1732 | 773 | 626 | 3111 |
| d1, Uniform Delay [s] | | 52.16 | 52.16 | 51.22 | 19.05 | 18.71 | 35.26 | 1.16 |
| k, delay calibration | | 0.11 | 0.11 | 0.11 | 0.50 | 0.50 | 0.34 | 0.50 |
| I, Upstream Filtering Factor | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | | 7.97 | 7.97 | 2.22 | 0.93 | 1.84 | 19.85 | 0.26 |
| d3, Initial Queue Delay [s] | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | | 0.66 | 0.66 | 0.32 | 0.47 | 0.44 | 0.95 | 0.31 |
| d, Delay for Lane Group [s/veh] | | 60.13 | 60.13 | 53.44 | 19.98 | 20.56 | 55.10 | 1.42 |
| Lane Group LOS | | E | E | D | B | C | E | A |
| Critical Lane Group | | Yes | No | No | Yes | No | Yes | No |
| 50th-Percentile Queue Length [veh/ln] | | 1.86 | 1.86 | 0.75 | 7.03 | 6.00 | 18.68 | 0.58 |
| 50th-Percentile Queue Length [ft/ln] | | 46.39 | 46.39 | 18.71 | 175.74 | 150.05 | 467.07 | 14.50 |
| 95th-Percentile Queue Length [veh/ln] | | 3.34 | 3.34 | 1.35 | 11.38 | 10.02 | 25.77 | 1.04 |
| 95th-Percentile Queue Length [ft/ln] | | 83.51 | 83.51 | 33.67 | 284.44 | 250.49 | 644.29 | 26.10 |



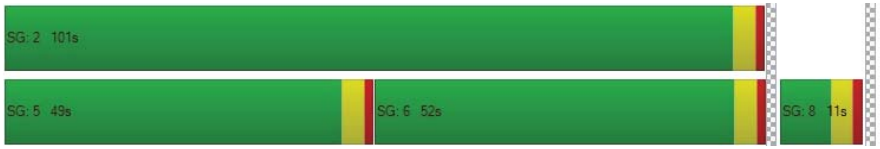
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**Movement, Approach, & Intersection Results**

| d_M, Delay for Movement [s/veh] | 0.00 | 0.00 | 0.00 | 60.13 | 60.13 | 53.44 | 0.00 | 19.98 | 20.56 | 55.10 | 1.42 | 0.00 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Movement LOS | | | | E | E | D | | B | C | E | A | |
| d_A, Approach Delay [s/veh] | 0.00 | | | 58.95 | | | 20.15 | | | 21.91 | | |
| Approach LOS | A | | | E | | | C | | | C | | |
| d_I, Intersection Delay [s/veh] | 23.10 | | | | | | | | | | | |
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.653 | | | | | | | | | | | |

**Sequence**

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | - | 2 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | 8 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |




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**Intersection Level Of Service Report**
**Intersection 18: Old Redwood Hwy/US 101 NB Ramp-Lakewood Dr**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 58.0 |
| Analysis Method: | HCM 2010 | Level Of Service: | E |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.847 |

**Intersection Setup**

| Name | US 101 NB Ramp | | | Lakewood Dr | | | Old Redwood Hwy | | | Old Redwood Hwy | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | | | | | | | | | | | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Pocket | 1 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pocket Length [ft] | 250.00 | 100.00 | 150.00 | 180.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| Speed [mph] | 35.00 | | | 35.00 | | | 35.00 | | | 35.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | No | | | No | | | No | | | No | | |

**Volumes**

| Name | US 101 NB Ramp | | | Lakewood Dr | | | Old Redwood Hwy | | | Old Redwood Hwy | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 281 | 273 | 98 | 248 | 0 | 647 | 297 | 511 | 0 | 0 | 755 | 205 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Rate | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 22 | 0 | 0 | 0 | 0 | 0 | 0 | 21 | 0 | 0 | 22 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right-Turn on Red Volume [veh/h] | 0 | 0 | 58 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 66 |
| Total Hourly Volume [veh/h] | 303 | 273 | 40 | 248 | 0 | 647 | 297 | 532 | 0 | 0 | 777 | 139 |
| Peak Hour Factor | 0.9000 | 0.9000 | 0.9000 | 0.9000 | 1.0000 | 0.9000 | 0.9000 | 0.9000 | 1.0000 | 1.0000 | 0.9000 | 0.9000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 84 | 76 | 11 | 69 | 0 | 180 | 83 | 148 | 0 | 0 | 216 | 39 |
| Total Analysis Volume [veh/h] | 337 | 303 | 44 | 276 | 0 | 719 | 330 | 591 | 0 | 0 | 863 | 154 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |



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**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | 1 - Central Windsor |
| Cycle Length [s] | 112 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 112.0 |
| Offset Reference | LeadGreen |
| Permissive Mode | SingleBand |
| Lost time [s] | 12.00 |

**Phasing & Timing**

| Control Type | Split | Split | Split | Permiss | Protecte | Overlap | Protecte | Permiss | Permiss | Permiss | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal group | 0 | 7 | 0 | 8 | 0 | 1 | 1 | 6 | 0 | 0 | 2 | 0 |
| Auxiliary Signal Groups | | | | | | 1,8 | | | | | | |
| Lead / Lag | - | - | - | Lead | - | - | Lead | - | - | - | - | - |
| Minimum Green [s] | 0 | 5 | 0 | 5 | 0 | 5 | 5 | 5 | 0 | 0 | 5 | 0 |
| Maximum Green [s] | 0 | 30 | 0 | 30 | 0 | 30 | 30 | 30 | 0 | 0 | 30 | 0 |
| Amber [s] | 0.0 | 3.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 |
| All red [s] | 0.0 | 1.0 | 0.0 | 1.0 | 0.0 | 1.0 | 1.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 |
| Split [s] | 0 | 22 | 0 | 12 | 0 | 45 | 45 | 78 | 0 | 0 | 33 | 0 |
| Vehicle Extension [s] | 0.0 | 3.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pedestrian Clearance [s] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Rest In Walk | | No | | No | | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 0.0 | 2.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 0.0 | 2.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 |
| Minimum Recall | | No | | No | | No | No | No | | | No | |
| Maximum Recall | | No | | No | | No | No | No | | | No | |
| Pedestrian Recall | | No | | No | | No | No | No | | | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 50.0 | 0.0 | 50.0 | 0.0 | 50.0 | 50.0 | 50.0 | 0.0 | 0.0 | 50.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

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**Lane Group Calculations**

| Lane Group | L | C | C | L | R | L | C | C | C |
|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 112 | 112 | 112 | 112 | 112 | 112 | 112 | 112 | 112 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 0.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 17 | 17 | 17 | 9 | 54 | 41 | 74 | 29 | 29 |
| g / C, Green / Cycle | 0.15 | 0.15 | 0.15 | 0.08 | 0.48 | 0.37 | 0.66 | 0.26 | 0.26 |
| (v / s)_i Volume / Saturation Flow Rate | 0.13 | 0.13 | 0.13 | 0.08 | 0.45 | 0.10 | 0.32 | 0.27 | 0.29 |
| s, saturation flow rate [veh/h] | 1774 | 1823 | 1636 | 3445 | 1583 | 3445 | 1863 | 1863 | 1768 |
| c, Capacity [veh/h] | 267 | 275 | 247 | 277 | 765 | 1265 | 1233 | 482 | 458 |
| d1, Uniform Delay [s] | 46.48 | 46.46 | 46.47 | 50.01 | 18.45 | 24.80 | 9.38 | 41.51 | 41.51 |
| k, delay calibration | 0.11 | 0.11 | 0.11 | 0.11 | 0.50 | 0.50 | 0.50 | 0.47 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 8.38 | 8.07 | 8.94 | 24.66 | 20.78 | 0.50 | 1.34 | 54.66 | 75.80 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.33 | 1.33 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.87 | 0.87 | 0.87 | 1.00 | 0.94 | 0.26 | 0.48 | 1.05 | 1.11 |
| d, Delay for Lane Group [s/veh] | 54.85 | 54.53 | 55.41 | 74.67 | 39.23 | 25.30 | 10.72 | 96.17 | 117.31 |
| Lane Group LOS | D | D | E | E | D | C | B | F | F |
| Critical Lane Group | Yes | No | No | No | Yes | No | No | No | Yes |
| 50th-Percentile Queue Length [veh/ln] | 6.85 | 7.00 | 6.35 | 4.65 | 13.75 | 3.12 | 6.89 | 20.30 | 21.96 |
| 50th-Percentile Queue Length [ft/ln] | 171.27 | 174.94 | 158.70 | 116.24 | 343.77 | 77.90 | 172.16 | 507.55 | 549.00 |
| 95th-Percentile Queue Length [veh/ln] | 11.14 | 11.34 | 10.48 | 8.19 | 19.83 | 5.61 | 11.19 | 28.60 | 31.53 |
| 95th-Percentile Queue Length [ft/ln] | 278.58 | 283.39 | 262.00 | 204.65 | 495.80 | 140.22 | 279.75 | 714.94 | 788.34 |



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**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 54.75 | 55.02 | 55.41 | 74.67 | 0.00 | 39.23 | 25.30 | 10.72 | 0.00 | 0.00 | 104.86 | 117.31 |
| Movement LOS | D | E | E | E | | D | C | B | | | F | F |
| d_A, Approach Delay [s/veh] | 54.91 | | | 49.06 | | | 15.95 | | | 106.74 | | |
| Approach LOS | D | | | D | | | B | | | F | | |
| d_I, Intersection Delay [s/veh] | 57.95 | | | | | | | | | | | |
| Intersection LOS | E | | | | | | | | | | | |
| Intersection V/C | 0.847 | | | | | | | | | | | |

**Sequence**

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | - | 6 | 7 | 8 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |




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5/29/2018

**Intersection Level Of Service Report**
**Intersection 16: Old Redwood Hwy/Windsor River Rd**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 23.8 |
| Analysis Method: | HCM 2010 | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.576 |

**Intersection Setup**

| Name | Conde Ln | | | Old Redwood Hwy | | | Windsor River Rd | | | Old Redwood Hwy | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | | | | | | | | | | | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Pocket | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 0 |
| Pocket Length [ft] | 75.00 | 100.00 | 75.00 | 75.00 | 100.00 | 100.00 | 75.00 | 100.00 | 75.00 | 200.00 | 100.00 | 100.00 |
| Speed [mph] | 35.00 | | | 35.00 | | | 30.00 | | | 35.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | No | | | No | | | No | | | No | | |

**Volumes**

| Name | Conde Ln | | | Old Redwood Hwy | | | Windsor River Rd | | | Old Redwood Hwy | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 94 | 70 | 141 | 360 | 50 | 15 | 19 | 483 | 26 | 195 | 561 | 579 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Rate | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 3 | 0 | 54 | 3 | 7 | 6 | 0 | 0 | 0 | 0 | 51 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right-Turn on Red Volume [veh/h] | 0 | 0 | 65 | 0 | 0 | 18 | 0 | 0 | 7 | 0 | 0 | 66 |
| Total Hourly Volume [veh/h] | 94 | 73 | 76 | 414 | 53 | 4 | 25 | 483 | 19 | 195 | 561 | 564 |
| Peak Hour Factor | 0.9800 | 0.9800 | 0.9800 | 0.9800 | 0.9800 | 0.9800 | 0.9800 | 0.9800 | 0.9800 | 0.9800 | 0.9800 | 0.9800 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 24 | 19 | 19 | 106 | 14 | 1 | 6 | 123 | 5 | 50 | 143 | 144 |
| Total Analysis Volume [veh/h] | 96 | 74 | 78 | 422 | 54 | 4 | 26 | 493 | 19 | 199 | 572 | 576 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |



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**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | 1 - Central Windsor |
| Cycle Length [s] | 112 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 61.0 |
| Offset Reference | LeadGreen |
| Permissive Mode | SingleBand |
| Lost time [s] | 12.00 |

**Phasing & Timing**

| Control Type | Protecte | Permiss | Overlap | Protecte | Permiss | Permiss | Protecte | Permiss | Permiss | Protecte | Permiss | Overlap |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal group | 8 | 8 | 1 | 7 | 7 | 0 | 5 | 2 | 0 | 1 | 6 | 7 |
| Auxiliary Signal Groups | | | 1,8 | | | | | | | | | 6,7 |
| Lead / Lag | Lag | - | - | Lead | - | - | Lag | - | - | Lead | - | - |
| Minimum Green [s] | 10 | 10 | 9 | 10 | 10 | 0 | 9 | 8 | 0 | 9 | 8 | 10 |
| Maximum Green [s] | 34 | 34 | 30 | 34 | 34 | 0 | 15 | 52 | 0 | 30 | 52 | 34 |
| Amber [s] | 3.2 | 3.2 | 3.6 | 3.2 | 3.2 | 0.0 | 3.2 | 3.2 | 0.0 | 3.6 | 3.6 | 3.2 |
| All red [s] | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.0 | 0.2 | 0.2 | 0.0 | 0.2 | 0.2 | 0.2 |
| Split [s] | 29 | 29 | 29 | 26 | 26 | 0 | 11 | 30 | 0 | 29 | 46 | 26 |
| Vehicle Extension [s] | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 3.0 |
| Walk [s] | 4 | 4 | 0 | 4 | 4 | 0 | 0 | 5 | 0 | 0 | 5 | 4 |
| Pedestrian Clearance [s] | 25 | 25 | 0 | 20 | 20 | 0 | 0 | 23 | 0 | 0 | 23 | 20 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 2.0 |
| I2, Clearance Lost Time [s] | 1.4 | 1.4 | 1.8 | 1.4 | 1.4 | 0.0 | 1.4 | 1.4 | 0.0 | 1.8 | 1.8 | 1.4 |
| Minimum Recall | No | No | No | No | No | | No | No | | No | No | No |
| Maximum Recall | No | No | No | No | No | | No | No | | No | No | No |
| Pedestrian Recall | No | No | No | No | No | | No | No | | No | No | No |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

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**Lane Group Calculations**

| Lane Group | L | C | R | L | C | L | C | C | L | C | R |
|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 112 | 112 | 112 | 112 | 112 | 112 | 112 | 112 | 112 | 112 | 112 |
| L, Total Lost Time per Cycle [s] | 3.40 | 3.40 | 3.80 | 3.40 | 3.40 | 3.40 | 3.40 | 3.40 | 3.80 | 3.80 | 3.40 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 2.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 1.40 | 1.40 | 0.00 | 1.40 | 1.40 | 1.40 | 1.40 | 1.40 | 1.80 | 1.80 | 0.00 |
| g_i, Effective Green Time [s] | 10 | 10 | 28 | 19 | 19 | 5 | 54 | 54 | 15 | 64 | 95 |
| g / C, Green / Cycle | 0.09 | 0.09 | 0.25 | 0.17 | 0.17 | 0.05 | 0.48 | 0.48 | 0.13 | 0.57 | 0.85 |
| (v / s)_i Volume / Saturation Flow Rate | 0.05 | 0.04 | 0.05 | 0.13 | 0.13 | 0.02 | 0.14 | 0.14 | 0.11 | 0.31 | 0.36 |
| s, saturation flow rate [veh/h] | 1774 | 1863 | 1583 | 1774 | 1790 | 1412 | 1863 | 1839 | 1774 | 1863 | 1583 |
| c, Capacity [veh/h] | 159 | 167 | 399 | 309 | 311 | 108 | 893 | 882 | 234 | 1054 | 1345 |
| d1, Uniform Delay [s] | 49.13 | 48.39 | 33.02 | 44.24 | 44.24 | 53.64 | 17.63 | 17.64 | 45.18 | 7.76 | 0.00 |
| k, delay calibration | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 3.62 | 1.83 | 0.24 | 4.15 | 4.12 | 1.13 | 0.81 | 0.83 | 8.45 | 2.01 | 1.00 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.33 | 1.33 | 1.33 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.60 | 0.44 | 0.20 | 0.77 | 0.77 | 0.24 | 0.29 | 0.29 | 0.85 | 0.54 | 0.43 |
| d, Delay for Lane Group [s/veh] | 52.75 | 50.22 | 33.26 | 48.39 | 48.35 | 54.77 | 18.44 | 18.46 | 53.63 | 9.77 | 1.00 |
| Lane Group LOS | D | D | C | D | D | D | B | B | D | A | A |
| Critical Lane Group | Yes | No | No | Yes | No | Yes | No | No | No | Yes | No |
| 50th-Percentile Queue Length [veh/ln] | 2.72 | 2.03 | 1.68 | 6.60 | 6.66 | 0.76 | 4.17 | 4.13 | 5.61 | 4.64 | 0.37 |
| 50th-Percentile Queue Length [ft/ln] | 68.05 | 50.75 | 42.10 | 165.06 | 166.43 | 18.93 | 104.27 | 103.30 | 140.29 | 116.02 | 9.33 |
| 95th-Percentile Queue Length [veh/ln] | 4.90 | 3.65 | 3.03 | 10.82 | 10.89 | 1.36 | 7.51 | 7.44 | 9.50 | 8.17 | 0.67 |
| 95th-Percentile Queue Length [ft/ln] | 122.48 | 91.35 | 75.77 | 270.41 | 272.22 | 34.07 | 187.69 | 185.93 | 237.42 | 204.34 | 16.79 |



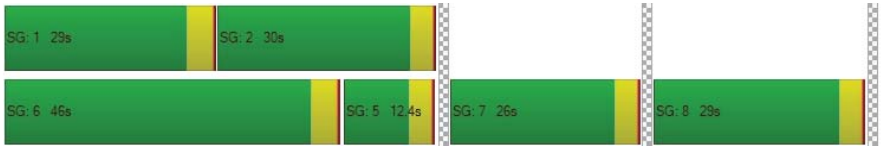
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**Movement, Approach, & Intersection Results**

| d_M, Delay for Movement [s/veh] | 52.75 | 50.22 | 33.26 | 48.37 | 48.35 | 48.35 | 54.77 | 18.45 | 18.46 | 53.63 | 9.77 | 1.00 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Movement LOS | D | D | C | D | D | D | D | B | B | D | A | A |
| d_A, Approach Delay [s/veh] | 45.86 | | | 48.37 | | | 20.21 | | | 12.50 | | |
| Approach LOS | D | | | D | | | C | | | B | | |
| d_I, Intersection Delay [s/veh] | 23.84 | | | | | | | | | | | |
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.576 | | | | | | | | | | | |

**Sequence**

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | 7 | 8 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |




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**Intersection Level Of Service Report**
**Intersection 17: US 101 SB Ramps/Old Redwood Hwy**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 20.3 |
| Analysis Method: | HCM 2010 | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.564 |

**Intersection Setup**

| Name | | | | US 101 SB Ramps | | | Old Redwood Hwy | | | Old Redwood Hwy | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | | | | | | | | | | | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Pocket | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 0 |
| Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 450.00 | 100.00 | 40.00 | 100.00 | 100.00 | 200.00 | 400.00 | 100.00 | 100.00 |
| Speed [mph] | 30.00 | | | 35.00 | | | 35.00 | | | 35.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | No | | | No | | | No | | | No | | |

**Volumes**

| Name | | | | US 101 SB Ramps | | | Old Redwood Hwy | | | Old Redwood Hwy | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 0 | 0 | 0 | 265 | 1 | 110 | 0 | 650 | 361 | 393 | 1060 | 0 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Rate | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 13 | 0 | 34 | 20 | 0 | 38 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right-Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 71 | 0 | 0 | 61 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 0 | 0 | 0 | 265 | 1 | 52 | 0 | 684 | 320 | 393 | 1098 | 0 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 0.9600 | 0.9600 | 0.9600 | 1.0000 | 0.9600 | 0.9600 | 0.9600 | 0.9600 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 0 | 0 | 0 | 69 | 0 | 14 | 0 | 178 | 83 | 102 | 286 | 0 |
| Total Analysis Volume [veh/h] | 0 | 0 | 0 | 276 | 1 | 54 | 0 | 713 | 333 | 409 | 1144 | 0 |
| Presence of On-Street Parking | | | | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |



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**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | 1 - Central Windsor |
| Cycle Length [s] | 112 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 48.5 |
| Offset Reference | LeadGreen |
| Permissive Mode | SingleBand |
| Lost time [s] | 9.00 |

**Phasing & Timing**

| Control Type | Permiss | Protecte | Permiss | Split | Split | Split | Permiss | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal group | 0 | 0 | 0 | 0 | 8 | 0 | 0 | 6 | 0 | 5 | 2 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | - | - | - | - | - | - | Lead | - | - |
| Minimum Green [s] | 0 | 0 | 0 | 0 | 5 | 0 | 0 | 5 | 0 | 5 | 5 | 0 |
| Maximum Green [s] | 0 | 0 | 0 | 0 | 30 | 0 | 0 | 30 | 0 | 30 | 30 | 0 |
| Amber [s] | 0.0 | 0.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 0.0 | 0.0 | 0.0 | 0.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 0 | 0 | 0 | 0 | 17 | 0 | 0 | 48 | 0 | 47 | 95 | 0 |
| Vehicle Extension [s] | 0.0 | 0.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pedestrian Clearance [s] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Rest In Walk | | | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 0.0 | 0.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 0.0 | 0.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | | | | | No | | | No | | No | No | |
| Maximum Recall | | | | | No | | | No | | No | No | |
| Pedestrian Recall | | | | | No | | | No | | No | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

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**Lane Group Calculations**

| Lane Group | | L | C | R | C | R | L | C |
|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | | 112 | 112 | 112 | 112 | 112 | 112 | 112 |
| L, Total Lost Time per Cycle [s] | | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | | 11 | 11 | 11 | 61 | 61 | 28 | 93 |
| g / C, Green / Cycle | | 0.10 | 0.10 | 0.10 | 0.55 | 0.55 | 0.25 | 0.83 |
| (v / s)_i Volume / Saturation Flow Rate | | 0.08 | 0.08 | 0.03 | 0.20 | 0.21 | 0.23 | 0.32 |
| s, saturation flow rate [veh/h] | | 1774 | 1775 | 1583 | 3547 | 1583 | 1774 | 3547 |
| c, Capacity [veh/h] | | 171 | 171 | 153 | 1937 | 865 | 444 | 2951 |
| d1, Uniform Delay [s] | | 49.59 | 49.59 | 47.33 | 14.44 | 14.61 | 40.89 | 2.33 |
| k, delay calibration | | 0.11 | 0.11 | 0.11 | 0.50 | 0.50 | 0.17 | 0.50 |
| I, Upstream Filtering Factor | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | | 8.78 | 8.78 | 1.39 | 0.54 | 1.30 | 11.74 | 0.39 |
| d3, Initial Queue Delay [s] | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | | 0.81 | 0.81 | 0.35 | 0.37 | 0.39 | 0.92 | 0.39 |
| d, Delay for Lane Group [s/veh] | | 58.37 | 58.37 | 48.72 | 14.98 | 15.91 | 52.63 | 2.71 |
| Lane Group LOS | | E | E | D | B | B | D | A |
| Critical Lane Group | | Yes | No | No | No | Yes | Yes | No |
| 50th-Percentile Queue Length [veh/ln] | | 4.17 | 4.17 | 1.46 | 5.06 | 4.95 | 12.19 | 1.94 |
| 50th-Percentile Queue Length [ft/ln] | | 104.31 | 104.34 | 36.42 | 126.46 | 123.87 | 304.72 | 48.45 |
| 95th-Percentile Queue Length [veh/ln] | | 7.51 | 7.51 | 2.62 | 8.75 | 8.61 | 17.91 | 3.49 |
| 95th-Percentile Queue Length [ft/ln] | | 187.76 | 187.81 | 65.55 | 218.67 | 215.14 | 447.87 | 87.21 |



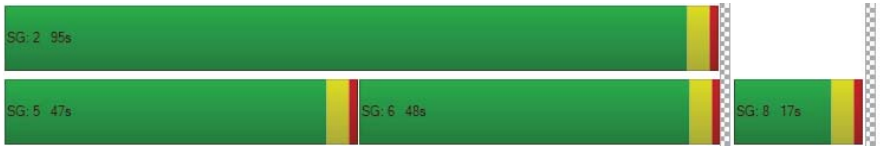
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**Movement, Approach, & Intersection Results**

| d_M, Delay for Movement [s/veh] | 0.00 | 0.00 | 0.00 | 58.37 | 58.37 | 48.72 | 0.00 | 14.98 | 15.91 | 52.63 | 2.71 | 0.00 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Movement LOS | | | | E | E | D | | B | B | D | A | |
| d_A, Approach Delay [s/veh] | 0.00 | | | 56.79 | | | 15.28 | | | 15.86 | | |
| Approach LOS | A | | | E | | | B | | | B | | |
| d_I, Intersection Delay [s/veh] | 20.28 | | | | | | | | | | | |
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.564 | | | | | | | | | | | |

**Sequence**

| Ring 1 | - | 2 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 2 | 5 | 6 | - | 8 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |




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**Intersection Level Of Service Report**
**Intersection 18: Old Redwood Hwy/US 101 NB Ramp-Lakewood Dr**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 56.6 |
| Analysis Method: | HCM 2010 | Level Of Service: | E |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.823 |

**Intersection Setup**

| Name | US 101 NB Ramp | | | Lakewood Dr | | | Old Redwood Hwy | | | Old Redwood Hwy | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | | | | | | | | | | | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Pocket | 1 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pocket Length [ft] | 250.00 | 100.00 | 150.00 | 180.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| Speed [mph] | 35.00 | | | 35.00 | | | 35.00 | | | 35.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | No | | | No | | | No | | | No | | |

**Volumes**

| Name | US 101 NB Ramp | | | Lakewood Dr | | | Old Redwood Hwy | | | Old Redwood Hwy | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 465 | 534 | 234 | 366 | 0 | 661 | 334 | 489 | 0 | 0 | 572 | 303 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Rate | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 19 | 0 | 0 | 0 | 0 | 0 | 0 | 21 | 0 | 0 | 19 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right-Turn on Red Volume [veh/h] | 0 | 0 | 83 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 111 |
| Total Hourly Volume [veh/h] | 484 | 534 | 151 | 366 | 0 | 661 | 334 | 510 | 0 | 0 | 591 | 192 |
| Peak Hour Factor | 0.9900 | 0.9900 | 0.9900 | 0.9900 | 1.0000 | 0.9900 | 0.9900 | 0.9900 | 1.0000 | 1.0000 | 0.9900 | 0.9900 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 122 | 135 | 38 | 92 | 0 | 167 | 84 | 129 | 0 | 0 | 149 | 48 |
| Total Analysis Volume [veh/h] | 489 | 539 | 153 | 370 | 0 | 668 | 337 | 515 | 0 | 0 | 597 | 194 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |



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**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | 1 - Central Windsor |
| Cycle Length [s] | 112 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 112.0 |
| Offset Reference | LeadGreen |
| Permissive Mode | SingleBand |
| Lost time [s] | 12.00 |

**Phasing & Timing**

| Control Type | Split | Split | Split | Permiss | Protecte | Overlap | Protecte | Permiss | Permiss | Permiss | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal group | 0 | 7 | 0 | 8 | 0 | 1 | 1 | 6 | 0 | 0 | 2 | 0 |
| Auxiliary Signal Groups | | | | | | 1,8 | | | | | | |
| Lead / Lag | - | - | - | Lead | - | - | Lead | - | - | - | - | - |
| Minimum Green [s] | 0 | 5 | 0 | 5 | 0 | 5 | 5 | 5 | 0 | 0 | 5 | 0 |
| Maximum Green [s] | 0 | 30 | 0 | 30 | 0 | 30 | 30 | 30 | 0 | 0 | 30 | 0 |
| Amber [s] | 0.0 | 3.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 |
| All red [s] | 0.0 | 1.0 | 0.0 | 1.0 | 0.0 | 1.0 | 1.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 |
| Split [s] | 0 | 34 | 0 | 15 | 0 | 34 | 34 | 63 | 0 | 0 | 29 | 0 |
| Vehicle Extension [s] | 0.0 | 3.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pedestrian Clearance [s] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Rest In Walk | | No | | No | | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 0.0 | 2.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 0.0 | 2.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 |
| Minimum Recall | | No | | No | | No | No | No | | | No | |
| Maximum Recall | | No | | No | | No | No | No | | | No | |
| Pedestrian Recall | | No | | No | | No | No | No | | | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 50.0 | 0.0 | 50.0 | 0.0 | 50.0 | 50.0 | 50.0 | 0.0 | 0.0 | 50.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

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**Lane Group Calculations**

| Lane Group | L | C | C | L | R | L | C | C | C |
|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 112 | 112 | 112 | 112 | 112 | 112 | 112 | 112 | 112 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 0.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 28 | 28 | 28 | 12 | 47 | 30 | 59 | 25 | 25 |
| g / C, Green / Cycle | 0.25 | 0.25 | 0.25 | 0.11 | 0.42 | 0.27 | 0.53 | 0.22 | 0.22 |
| (v / s)_i Volume / Saturation Flow Rate | 0.23 | 0.23 | 0.23 | 0.11 | 0.42 | 0.10 | 0.28 | 0.21 | 0.23 |
| s, saturation flow rate [veh/h] | 1774 | 1844 | 1576 | 3445 | 1583 | 3445 | 1863 | 1863 | 1714 |
| c, Capacity [veh/h] | 451 | 469 | 401 | 379 | 658 | 930 | 985 | 416 | 383 |
| d1, Uniform Delay [s] | 40.40 | 40.38 | 40.41 | 47.72 | 25.00 | 33.13 | 17.21 | 42.97 | 43.57 |
| k, delay calibration | 0.34 | 0.34 | 0.34 | 0.11 | 0.50 | 0.50 | 0.50 | 0.30 | 0.35 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 17.06 | 16.34 | 18.85 | 16.52 | 38.82 | 1.09 | 1.98 | 24.12 | 47.44 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.33 | 1.33 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.90 | 0.89 | 0.90 | 0.98 | 1.01 | 0.36 | 0.52 | 0.95 | 1.03 |
| d, Delay for Lane Group [s/veh] | 57.46 | 56.72 | 59.26 | 64.23 | 63.82 | 34.22 | 19.19 | 67.10 | 91.01 |
| Lane Group LOS | E | E | E | E | F | C | B | E | F |
| Critical Lane Group | No | No | Yes | No | Yes | No | No | No | Yes |
| 50th-Percentile Queue Length [veh/ln] | 12.65 | 13.03 | 11.45 | 5.73 | 18.83 | 3.81 | 8.78 | 13.37 | 15.42 |
| 50th-Percentile Queue Length [ft/ln] | 316.14 | 325.65 | 286.23 | 143.19 | 470.86 | 95.22 | 219.54 | 334.22 | 385.59 |
| 95th-Percentile Queue Length [veh/ln] | 18.48 | 18.94 | 17.00 | 9.65 | 26.23 | 6.86 | 13.64 | 19.36 | 22.28 |
| 95th-Percentile Queue Length [ft/ln] | 461.94 | 473.62 | 424.96 | 241.31 | 655.74 | 171.40 | 341.03 | 484.12 | 556.95 |



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**Movement, Approach, & Intersection Results**

| d_M, Delay for Movement [s/veh] | 57.31 | 57.69 | 59.26 | 64.23 | 0.00 | 63.82 | 34.22 | 19.19 | 0.00 | 0.00 | 75.17 | 91.01 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Movement LOS | E | E | E | E | | F | C | B | | | E | F |
| d_A, Approach Delay [s/veh] | 57.74 | | | 63.97 | | | 25.14 | | | 79.06 | | |
| Approach LOS | E | | | E | | | C | | | E | | |
| d_I, Intersection Delay [s/veh] | 56.59 | | | | | | | | | | | |
| Intersection LOS | E | | | | | | | | | | | |
| Intersection V/C | 0.823 | | | | | | | | | | | |

**Sequence**

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | - | 6 | 7 | 8 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |




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**Intersection Level Of Service Report**
**Intersection 16: Old Redwood Hwy/Windsor River Rd**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 38.5 |
| Analysis Method: | HCM 2010 | Level Of Service: | D |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.731 |

**Intersection Setup**

| Name | Conde Ln | | | Old Redwood Hwy | | | Windsor River Rd | | | Old Redwood Hwy | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | | | | | | | | | | | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Pocket | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 0 |
| Pocket Length [ft] | 75.00 | 100.00 | 75.00 | 200.00 | 100.00 | 100.00 | 75.00 | 100.00 | 75.00 | 200.00 | 100.00 | 100.00 |
| Speed [mph] | 35.00 | | | 35.00 | | | 30.00 | | | 35.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | No | | | No | | | No | | | No | | |

**Volumes**

| Name | Conde Ln | | | Old Redwood Hwy | | | Windsor River Rd | | | Old Redwood Hwy | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 32 | 86 | 309 | 528 | 121 | 16 | 26 | 622 | 36 | 223 | 411 | 197 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Rate | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 4 | 0 | 58 | 4 | 7 | 7 | 0 | 0 | 0 | 0 | 58 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right-Turn on Red Volume [veh/h] | 0 | 0 | 31 | 0 | 0 | 2 | 0 | 0 | 4 | 0 | 0 | 20 |
| Total Hourly Volume [veh/h] | 32 | 90 | 278 | 586 | 125 | 21 | 33 | 622 | 32 | 223 | 411 | 235 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 8 | 23 | 70 | 147 | 31 | 5 | 8 | 156 | 8 | 56 | 103 | 59 |
| Total Analysis Volume [veh/h] | 32 | 90 | 278 | 586 | 125 | 21 | 33 | 622 | 32 | 223 | 411 | 235 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |



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**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | 1 - Central Windsor |
| Cycle Length [s] | 112 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 20.0 |
| Offset Reference | LeadGreen |
| Permissive Mode | SingleBand |
| Lost time [s] | 12.00 |

**Phasing & Timing**

| Control Type | Split | Split | Overlap | Split | Split | Split | Protecte | Permiss | Permiss | Protecte | Permiss | Overlap |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal group | 8 | 8 | 1 | 7 | 7 | 0 | 5 | 2 | 0 | 1 | 6 | 7 |
| Auxiliary Signal Groups | | | 1,8 | | | | | | | | | 6,7 |
| Lead / Lag | Lag | - | - | Lead | - | - | Lag | - | - | Lead | - | - |
| Minimum Green [s] | 10 | 10 | 9 | 10 | 10 | 0 | 9 | 8 | 0 | 9 | 8 | 10 |
| Maximum Green [s] | 34 | 34 | 30 | 5 | 5 | 0 | 15 | 52 | 0 | 30 | 52 | 5 |
| Amber [s] | 3.2 | 3.2 | 3.6 | 3.2 | 3.2 | 0.0 | 3.2 | 3.2 | 0.0 | 3.6 | 3.6 | 3.2 |
| All red [s] | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.0 | 0.2 | 0.2 | 0.0 | 0.2 | 0.2 | 0.2 |
| Split [s] | 29 | 29 | 24 | 24 | 24 | 0 | 15 | 35 | 0 | 24 | 44 | 24 |
| Vehicle Extension [s] | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 3.0 |
| Walk [s] | 4 | 4 | 0 | 4 | 4 | 0 | 0 | 5 | 0 | 0 | 5 | 4 |
| Pedestrian Clearance [s] | 25 | 25 | 0 | 20 | 20 | 0 | 0 | 23 | 0 | 0 | 23 | 20 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 2.0 |
| I2, Clearance Lost Time [s] | 1.4 | 1.4 | 1.8 | 1.4 | 1.4 | 0.0 | 1.4 | 1.4 | 0.0 | 1.8 | 1.8 | 1.4 |
| Minimum Recall | | No | No | | Yes | | No | No | | No | No | Yes |
| Maximum Recall | | No | No | | No | | No | No | | No | No | No |
| Pedestrian Recall | | No | No | | No | | No | No | | No | No | No |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

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**Lane Group Calculations**

| Lane Group | L | C | R | L | C | L | C | C | L | C | R |
|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 112 | 112 | 112 | 112 | 112 | 112 | 112 | 112 | 112 | 112 | 112 |
| L, Total Lost Time per Cycle [s] | 3.40 | 3.40 | 3.80 | 3.40 | 3.40 | 3.40 | 3.40 | 3.40 | 3.80 | 3.80 | 3.40 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 2.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 1.40 | 1.40 | 0.00 | 1.40 | 1.40 | 1.40 | 1.40 | 1.40 | 1.80 | 1.80 | 0.00 |
| g_i, Effective Green Time [s] | 18 | 18 | 39 | 25 | 25 | 6 | 37 | 37 | 18 | 49 | 87 |
| g / C, Green / Cycle | 0.16 | 0.16 | 0.35 | 0.22 | 0.22 | 0.05 | 0.33 | 0.33 | 0.16 | 0.44 | 0.78 |
| (v / s)_i Volume / Saturation Flow Rate | 0.02 | 0.05 | 0.18 | 0.21 | 0.21 | 0.02 | 0.18 | 0.18 | 0.13 | 0.22 | 0.15 |
| s, saturation flow rate [veh/h] | 1774 | 1863 | 1583 | 1774 | 1791 | 1412 | 1863 | 1831 | 1774 | 1863 | 1583 |
| c, Capacity [veh/h] | 289 | 303 | 558 | 396 | 400 | 113 | 613 | 603 | 283 | 814 | 1229 |
| d1, Uniform Delay [s] | 39.98 | 41.25 | 28.47 | 42.51 | 42.48 | 53.47 | 30.61 | 30.62 | 42.31 | 16.21 | 0.00 |
| k, delay calibration | 0.11 | 0.11 | 0.20 | 0.37 | 0.36 | 0.11 | 0.50 | 0.50 | 0.11 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 0.17 | 0.54 | 1.28 | 23.17 | 22.65 | 1.42 | 3.36 | 3.42 | 4.87 | 2.23 | 0.35 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.33 | 1.33 | 1.33 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.11 | 0.30 | 0.50 | 0.92 | 0.92 | 0.29 | 0.54 | 0.54 | 0.79 | 0.50 | 0.19 |
| d, Delay for Lane Group [s/veh] | 40.14 | 41.79 | 29.75 | 65.68 | 65.13 | 54.88 | 33.97 | 34.05 | 47.18 | 18.44 | 0.35 |
| Lane Group LOS | D | D | C | E | E | D | C | C | D | B | A |
| Critical Lane Group | No | No | Yes | Yes | No | No | No | Yes | Yes | No | No |
| 50th-Percentile Queue Length [veh/ln] | 0.76 | 2.21 | 5.94 | 12.21 | 12.23 | 0.96 | 7.78 | 7.67 | 5.84 | 5.76 | 0.12 |
| 50th-Percentile Queue Length [ft/ln] | 19.03 | 55.37 | 148.55 | 305.16 | 305.86 | 24.05 | 194.50 | 191.77 | 145.95 | 144.02 | 2.95 |
| 95th-Percentile Queue Length [veh/ln] | 1.37 | 3.99 | 9.94 | 17.94 | 17.97 | 1.73 | 12.35 | 12.21 | 9.80 | 9.70 | 0.21 |
| 95th-Percentile Queue Length [ft/ln] | 34.25 | 99.67 | 248.49 | 448.40 | 449.27 | 43.30 | 308.86 | 305.33 | 245.01 | 242.43 | 5.31 |



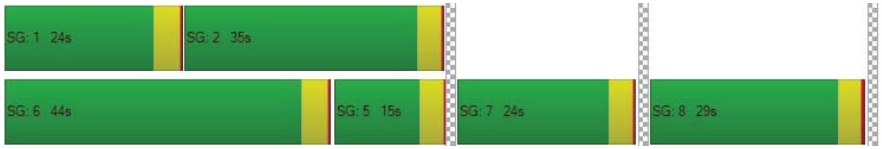
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**Movement, Approach, & Intersection Results**

| d_M, Delay for Movement [s/veh] | 40.14 | 41.79 | 29.75 | 65.47 | 65.13 | 65.13 | 54.88 | 34.01 | 34.05 | 47.18 | 18.44 | 0.35 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Movement LOS | D | D | C | E | E | E | D | C | C | D | B | A |
| d_A, Approach Delay [s/veh] | 33.29 | | | 65.41 | | | 35.01 | | | 20.92 | | |
| Approach LOS | C | | | E | | | D | | | C | | |
| d_I, Intersection Delay [s/veh] | 38.48 | | | | | | | | | | | |
| Intersection LOS | D | | | | | | | | | | | |
| Intersection V/C | 0.731 | | | | | | | | | | | |

**Sequence**

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | 7 | 8 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |




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**Intersection Level Of Service Report**
**Intersection 17: US 101 SB Ramps/Old Redwood Hwy**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 30.1 |
| Analysis Method: | HCM 2010 | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.828 |

**Intersection Setup**

| Name | | | | US 101 SB Ramps | | | Old Redwood Hwy | | | Old Redwood Hwy | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | | | | | | | | | | | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Pocket | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 0 |
| Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 450.00 | 100.00 | 40.00 | 100.00 | 100.00 | 200.00 | 400.00 | 100.00 | 100.00 |
| Speed [mph] | | 30.00 | | | 35.00 | | | 35.00 | | | 35.00 | |
| Grade [%] | | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | |
| Crosswalk | | No | | | No | | | No | | | No | |

**Volumes**

| Name | | | | US 101 SB Ramps | | | Old Redwood Hwy | | | Old Redwood Hwy | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 0 | 0 | 0 | 157 | 0 | 144 | 1 | 699 | 814 | 559 | 742 | 0 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Rate | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 14 | 0 | 36 | 22 | 0 | 44 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right-Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 43 | 0 | 0 | 244 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 0 | 0 | 0 | 157 | 0 | 115 | 1 | 735 | 592 | 559 | 786 | 0 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 0 | 0 | 0 | 39 | 0 | 29 | 0 | 184 | 148 | 140 | 197 | 0 |
| Total Analysis Volume [veh/h] | 0 | 0 | 0 | 157 | 0 | 115 | 1 | 735 | 592 | 559 | 786 | 0 |
| Presence of On-Street Parking | | | | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pedestrian Volume [ped/h] | | 0 | | | 0 | | | 0 | | | 0 | |
| Bicycle Volume [bicycles/h] | | 0 | | | 0 | | | 0 | | | 0 | |



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**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | 1 - Central Windsor |
| Cycle Length [s] | 112 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 48.5 |
| Offset Reference | LeadGreen |
| Permissive Mode | SingleBand |
| Lost time [s] | 9.00 |

**Phasing & Timing**

| Control Type | Permiss | Protecte | Permiss | Split | Split | Split | Permiss | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal group | 0 | 0 | 0 | 0 | 8 | 0 | 0 | 6 | 0 | 5 | 2 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | - | - | - | - | - | - | Lead | - | - |
| Minimum Green [s] | 0 | 0 | 0 | 0 | 5 | 0 | 0 | 5 | 0 | 5 | 5 | 0 |
| Maximum Green [s] | 0 | 0 | 0 | 0 | 30 | 0 | 0 | 30 | 0 | 30 | 30 | 0 |
| Amber [s] | 0.0 | 0.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 0.0 | 0.0 | 0.0 | 0.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 0 | 0 | 0 | 0 | 11 | 0 | 0 | 52 | 0 | 49 | 101 | 0 |
| Vehicle Extension [s] | 0.0 | 0.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pedestrian Clearance [s] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Rest In Walk | | | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 0.0 | 0.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 0.0 | 0.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | | | | | No | | | No | | No | No | |
| Maximum Recall | | | | | No | | | No | | No | No | |
| Pedestrian Recall | | | | | No | | | No | | No | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

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**Lane Group Calculations**

| Lane Group | | L | C | R | C | R | L | C |
|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | | 112 | 112 | 112 | 112 | 112 | 112 | 112 |
| L, Total Lost Time per Cycle [s] | | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | | 7 | 7 | 7 | 56 | 56 | 37 | 97 |
| g / C, Green / Cycle | | 0.06 | 0.06 | 0.06 | 0.50 | 0.50 | 0.33 | 0.87 |
| (v / s)_i Volume / Saturation Flow Rate | | 0.04 | 0.04 | 0.07 | 0.21 | 0.37 | 0.32 | 0.22 |
| s, saturation flow rate [veh/h] | | 1774 | 1774 | 1583 | 3547 | 1583 | 1774 | 3547 |
| c, Capacity [veh/h] | | 112 | 112 | 100 | 1759 | 785 | 592 | 3070 |
| d1, Uniform Delay [s] | | 51.44 | 51.44 | 52.47 | 17.93 | 22.71 | 36.28 | 1.30 |
| k, delay calibration | | 0.11 | 0.11 | 0.11 | 0.50 | 0.50 | 0.30 | 0.50 |
| I, Upstream Filtering Factor | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | | 7.81 | 7.81 | 91.65 | 0.73 | 6.62 | 18.13 | 0.20 |
| d3, Initial Queue Delay [s] | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | | 0.70 | 0.70 | 1.15 | 0.42 | 0.75 | 0.94 | 0.26 |
| d, Delay for Lane Group [s/veh] | | 59.25 | 59.25 | 144.12 | 18.67 | 29.32 | 54.41 | 1.50 |
| Lane Group LOS | | E | E | F | B | C | D | A |
| Critical Lane Group | | No | No | Yes | No | Yes | Yes | No |
| 50th-Percentile Queue Length [veh/ln] | | 2.38 | 2.38 | 5.30 | 6.00 | 13.32 | 17.36 | 0.62 |
| 50th-Percentile Queue Length [ft/ln] | | 59.53 | 59.53 | 132.62 | 150.03 | 332.99 | 433.89 | 15.56 |
| 95th-Percentile Queue Length [veh/ln] | | 4.29 | 4.29 | 9.46 | 10.02 | 19.31 | 24.19 | 1.12 |
| 95th-Percentile Queue Length [ft/ln] | | 107.16 | 107.16 | 236.60 | 250.48 | 482.63 | 604.70 | 28.00 |



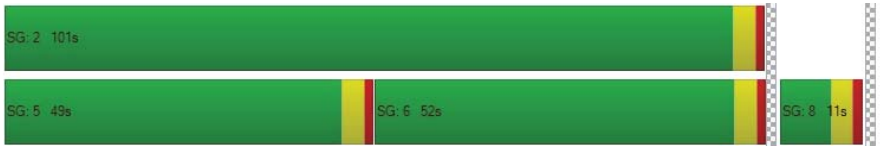
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**Movement, Approach, & Intersection Results**

| d_M, Delay for Movement [s/veh] | 0.00 | 0.00 | 0.00 | 59.25 | 59.25 | 144.12 | 0.00 | 18.67 | 29.32 | 54.41 | 1.50 | 0.00 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Movement LOS | | | | E | E | F | | B | C | D | A | |
| d_A, Approach Delay [s/veh] | 0.00 | | | 95.13 | | | 23.42 | | | 23.49 | | |
| Approach LOS | A | | | F | | | C | | | C | | |
| d_I, Intersection Delay [s/veh] | 30.08 | | | | | | | | | | | |
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.828 | | | | | | | | | | | |

**Sequence**

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | - | 2 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | 8 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |




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**Intersection Level Of Service Report**
**Intersection 18: Old Redwood Hwy/US 101 NB Ramp-Lakewood Dr**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 33.3 |
| Analysis Method: | HCM 2010 | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.554 |

**Intersection Setup**

| Name | US 101 NB Ramp | | | Lakewood Dr | | | Old Redwood Hwy | | | Old Redwood Hwy | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | | | | | | | | | | | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Pocket | 1 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pocket Length [ft] | 250.00 | 100.00 | 150.00 | 180.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| Speed [mph] | 35.00 | | | 35.00 | | | 35.00 | | | 35.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | No | | | No | | | No | | | No | | |

**Volumes**

| Name | US 101 NB Ramp | | | Lakewood Dr | | | Old Redwood Hwy | | | Old Redwood Hwy | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 224 | 255 | 92 | 255 | 0 | 679 | 264 | 610 | 0 | 0 | 650 | 156 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Rate | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 22 | 0 | 0 | 0 | 0 | 0 | 0 | 21 | 0 | 0 | 22 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right-Turn on Red Volume [veh/h] | 0 | 0 | 28 | 0 | 0 | 204 | 0 | 0 | 0 | 0 | 0 | 47 |
| Total Hourly Volume [veh/h] | 246 | 255 | 64 | 255 | 0 | 475 | 264 | 631 | 0 | 0 | 672 | 109 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 62 | 64 | 16 | 64 | 0 | 119 | 66 | 158 | 0 | 0 | 168 | 27 |
| Total Analysis Volume [veh/h] | 246 | 255 | 64 | 255 | 0 | 475 | 264 | 631 | 0 | 0 | 672 | 109 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |



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**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | 1 - Central Windsor |
| Cycle Length [s] | 112 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 112.0 |
| Offset Reference | LeadGreen |
| Permissive Mode | SingleBand |
| Lost time [s] | 12.00 |

**Phasing & Timing**

| Control Type | Split | Split | Split | Permiss | Protecte | Overlap | Protecte | Permiss | Permiss | Permiss | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal group | 0 | 7 | 0 | 8 | 0 | 1 | 1 | 6 | 0 | 0 | 2 | 0 |
| Auxiliary Signal Groups | | | | | | 1,8 | | | | | | |
| Lead / Lag | - | - | - | Lead | - | - | Lead | - | - | - | - | - |
| Minimum Green [s] | 0 | 5 | 0 | 5 | 0 | 5 | 5 | 5 | 0 | 0 | 5 | 0 |
| Maximum Green [s] | 0 | 30 | 0 | 30 | 0 | 30 | 30 | 30 | 0 | 0 | 30 | 0 |
| Amber [s] | 0.0 | 3.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 |
| All red [s] | 0.0 | 1.0 | 0.0 | 1.0 | 0.0 | 1.0 | 1.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 |
| Split [s] | 0 | 22 | 0 | 12 | 0 | 29 | 29 | 78 | 0 | 0 | 49 | 0 |
| Vehicle Extension [s] | 0.0 | 3.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pedestrian Clearance [s] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Rest In Walk | | No | | No | | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 0.0 | 2.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 0.0 | 2.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 |
| Minimum Recall | | No | | No | | No | No | No | | | No | |
| Maximum Recall | | No | | No | | No | No | No | | | No | |
| Pedestrian Recall | | No | | No | | No | No | No | | | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 50.0 | 0.0 | 0.0 | 0.0 | 0.0 | 50.0 | 50.0 | 0.0 | 0.0 | 50.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

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**Lane Group Calculations**

| Lane Group | L | C | C | L | R | L | C | C | C |
|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 112 | 112 | 112 | 112 | 112 | 112 | 112 | 112 | 112 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 0.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 15 | 15 | 15 | 11 | 57 | 41 | 74 | 29 | 29 |
| g / C, Green / Cycle | 0.13 | 0.13 | 0.13 | 0.10 | 0.50 | 0.37 | 0.66 | 0.26 | 0.26 |
| (v / s)_i Volume / Saturation Flow Rate | 0.11 | 0.11 | 0.11 | 0.07 | 0.30 | 0.08 | 0.34 | 0.21 | 0.22 |
| s, saturation flow rate [veh/h] | 1774 | 1838 | 1591 | 3445 | 1583 | 3445 | 1863 | 1863 | 1775 |
| c, Capacity [veh/h] | 235 | 244 | 211 | 339 | 799 | 1275 | 1233 | 477 | 455 |
| d1, Uniform Delay [s] | 47.29 | 47.26 | 47.31 | 47.34 | 12.10 | 24.06 | 9.68 | 39.23 | 39.74 |
| k, delay calibration | 0.11 | 0.11 | 0.11 | 0.11 | 0.50 | 0.50 | 0.50 | 0.11 | 0.13 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 6.96 | 6.54 | 7.78 | 3.38 | 3.25 | 0.37 | 1.52 | 3.53 | 5.64 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.33 | 1.33 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.82 | 0.82 | 0.82 | 0.75 | 0.59 | 0.21 | 0.51 | 0.82 | 0.86 |
| d, Delay for Lane Group [s/veh] | 54.25 | 53.80 | 55.09 | 50.72 | 15.35 | 24.43 | 11.20 | 42.76 | 45.38 |
| Lane Group LOS | D | D | E | D | B | C | B | D | D |
| Critical Lane Group | No | No | Yes | No | Yes | No | No | No | Yes |
| 50th-Percentile Queue Length [veh/ln] | 5.62 | 5.76 | 5.11 | 3.46 | 5.54 | 2.42 | 7.61 | 10.37 | 10.74 |
| 50th-Percentile Queue Length [ft/ln] | 140.58 | 144.05 | 127.63 | 86.38 | 138.45 | 60.60 | 190.13 | 259.23 | 268.60 |
| 95th-Percentile Queue Length [veh/ln] | 9.51 | 9.70 | 8.81 | 6.22 | 9.40 | 4.36 | 12.13 | 15.65 | 16.12 |
| 95th-Percentile Queue Length [ft/ln] | 237.81 | 242.46 | 220.27 | 155.49 | 234.94 | 109.07 | 303.19 | 391.25 | 402.99 |



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**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 54.14 | 54.35 | 55.09 | 50.72 | 0.00 | 15.35 | 24.43 | 11.20 | 0.00 | 0.00 | 43.86 | 45.38 |
| Movement LOS | D | D | E | D | | B | C | B | | | D | D |
| d_A, Approach Delay [s/veh] | 54.35 | | | 27.71 | | | 15.10 | | | 44.07 | | |
| Approach LOS | D | | | C | | | B | | | D | | |
| d_I, Intersection Delay [s/veh] | 33.28 | | | | | | | | | | | |
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.554 | | | | | | | | | | | |

**Sequence**

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | - | 6 | 7 | 8 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |




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**Intersection Level Of Service Report**
**Intersection 16: Old Redwood Hwy/Windsor River Rd**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 28.4 |
| Analysis Method: | HCM 2010 | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.694 |

**Intersection Setup**

| Name | Conde Ln | | | Old Redwood Hwy | | | Windsor River Rd | | | Old Redwood Hwy | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | | | | | | | | | | | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Pocket | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 0 |
| Pocket Length [ft] | 75.00 | 100.00 | 75.00 | 200.00 | 100.00 | 100.00 | 75.00 | 100.00 | 75.00 | 200.00 | 100.00 | 100.00 |
| Speed [mph] | 35.00 | | | 35.00 | | | 30.00 | | | 35.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | No | | | No | | | No | | | No | | |

**Volumes**

| Name | Conde Ln | | | Old Redwood Hwy | | | Windsor River Rd | | | Old Redwood Hwy | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 44 | 83 | 217 | 319 | 72 | 24 | 28 | 562 | 29 | 278 | 675 | 341 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Rate | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 3 | 0 | 54 | 3 | 7 | 6 | 0 | 0 | 0 | 0 | 51 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right-Turn on Red Volume [veh/h] | 0 | 0 | 22 | 0 | 0 | 2 | 0 | 0 | 3 | 0 | 0 | 34 |
| Total Hourly Volume [veh/h] | 44 | 86 | 195 | 373 | 75 | 29 | 34 | 562 | 26 | 278 | 675 | 358 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 11 | 22 | 49 | 93 | 19 | 7 | 9 | 141 | 7 | 70 | 169 | 90 |
| Total Analysis Volume [veh/h] | 44 | 86 | 195 | 373 | 75 | 29 | 34 | 562 | 26 | 278 | 675 | 358 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |



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**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | 1 - Central Windsor |
| Cycle Length [s] | 112 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 61.0 |
| Offset Reference | LeadGreen |
| Permissive Mode | SingleBand |
| Lost time [s] | 12.00 |

**Phasing & Timing**

| Control Type | Split | Split | Overlap | Split | Split | Split | Protecte | Permiss | Permiss | Protecte | Permiss | Overlap |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal group | 3 | 8 | 1 | 7 | 7 | 0 | 5 | 2 | 0 | 1 | 6 | 7 |
| Auxiliary Signal Groups | | | 1,8 | | | | | | | | | 6,7 |
| Lead / Lag | - | - | - | Lead | - | - | Lag | - | - | Lead | - | - |
| Minimum Green [s] | 0 | 10 | 9 | 10 | 10 | 0 | 9 | 8 | 0 | 9 | 8 | 10 |
| Maximum Green [s] | 0 | 34 | 30 | 5 | 5 | 0 | 15 | 52 | 0 | 30 | 52 | 5 |
| Amber [s] | 0.0 | 3.2 | 3.6 | 3.2 | 3.2 | 0.0 | 3.2 | 3.2 | 0.0 | 3.6 | 3.6 | 3.2 |
| All red [s] | 0.0 | 0.2 | 0.2 | 0.2 | 0.2 | 0.0 | 0.2 | 0.2 | 0.0 | 0.2 | 0.2 | 0.2 |
| Split [s] | 0 | 29 | 29 | 26 | 26 | 0 | 11 | 30 | 0 | 29 | 46 | 26 |
| Vehicle Extension [s] | 0.0 | 3.0 | 3.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 | 3.0 | 3.0 | 3.0 |
| Walk [s] | 0 | 4 | 0 | 4 | 4 | 0 | 0 | 5 | 0 | 0 | 5 | 4 |
| Pedestrian Clearance [s] | 0 | 25 | 0 | 20 | 20 | 0 | 0 | 23 | 0 | 0 | 23 | 20 |
| Rest In Walk | | No | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 0.0 | 2.0 | 2.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 | 2.0 | 2.0 | 2.0 |
| I2, Clearance Lost Time [s] | 0.0 | 1.4 | 1.8 | 1.4 | 1.4 | 0.0 | 1.4 | 1.4 | 0.0 | 1.8 | 1.8 | 1.4 |
| Minimum Recall | | No | No | | Yes | | No | No | | No | No | Yes |
| Maximum Recall | | No | No | | No | | No | No | | No | No | No |
| Pedestrian Recall | | No | No | | No | | No | No | | No | No | No |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

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**Lane Group Calculations**

| Lane Group | L | C | R | L | C | L | C | C | L | C | R |
|---|---|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 112 | 112 | 112 | 112 | 112 | 112 | 112 | 112 | 112 | 112 | 112 |
| L, Total Lost Time per Cycle [s] | 3.40 | 3.40 | 3.80 | 3.40 | 3.40 | 3.40 | 3.40 | 3.40 | 3.80 | 3.80 | 3.40 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 2.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 1.40 | 1.40 | 0.00 | 1.40 | 1.40 | 1.40 | 1.40 | 1.40 | 1.80 | 1.80 | 0.00 |
| g_i, Effective Green Time [s] | 13 | 13 | 37 | 18 | 18 | 6 | 47 | 47 | 20 | 60 | 92 |
| g / C, Green / Cycle | 0.12 | 0.12 | 0.33 | 0.16 | 0.16 | 0.05 | 0.42 | 0.42 | 0.18 | 0.54 | 0.82 |
| (v / s)_i Volume / Saturation Flow Rate | 0.02 | 0.05 | 0.12 | 0.13 | 0.13 | 0.02 | 0.16 | 0.16 | 0.16 | 0.36 | 0.23 |
| s, saturation flow rate [veh/h] | 1774 | 1863 | 1583 | 1774 | 1775 | 1412 | 1863 | 1834 | 1774 | 1863 | 1583 |
| c, Capacity [veh/h] | 213 | 224 | 518 | 288 | 288 | 123 | 776 | 764 | 313 | 1003 | 1297 |
| d1, Uniform Delay [s] | 44.53 | 45.53 | 28.96 | 45.50 | 45.50 | 52.77 | 22.72 | 22.73 | 41.79 | 10.43 | 0.00 |
| k, delay calibration | 0.11 | 0.11 | 0.11 | 0.15 | 0.15 | 0.11 | 0.50 | 0.50 | 0.15 | 0.50 | 0.50 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 0.47 | 1.08 | 0.45 | 8.06 | 8.05 | 1.20 | 1.43 | 1.45 | 11.05 | 3.60 | 0.53 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.33 | 1.33 | 1.33 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.21 | 0.38 | 0.38 | 0.83 | 0.83 | 0.28 | 0.38 | 0.38 | 0.89 | 0.67 | 0.28 |
| d, Delay for Lane Group [s/veh] | 45.01 | 46.61 | 29.42 | 53.55 | 53.55 | 53.97 | 24.14 | 24.18 | 52.84 | 14.03 | 0.53 |
| Lane Group LOS | D | D | C | D | D | D | C | C | D | B | A |
| Critical Lane Group | No | No | Yes | Yes | No | Yes | No | No | No | Yes | No |
| 50th-Percentile Queue Length [veh/ln] | 1.12 | 2.26 | 4.04 | 6.97 | 6.97 | 0.98 | 5.69 | 5.62 | 7.87 | 7.03 | 0.19 |
| 50th-Percentile Queue Length [ft/ln] | 28.11 | 56.45 | 100.95 | 174.17 | 174.23 | 24.53 | 142.22 | 140.48 | 196.85 | 175.67 | 4.76 |
| 95th-Percentile Queue Length [veh/ln] | 2.02 | 4.06 | 7.27 | 11.30 | 11.30 | 1.77 | 9.60 | 9.51 | 12.48 | 11.37 | 0.34 |
| 95th-Percentile Queue Length [ft/ln] | 50.60 | 101.61 | 181.71 | 282.39 | 282.46 | 44.15 | 240.01 | 237.67 | 311.90 | 284.36 | 8.56 |



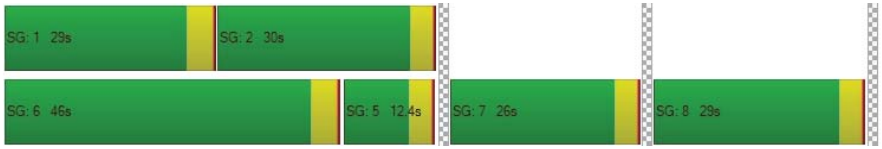
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**Movement, Approach, & Intersection Results**

| d_M, Delay for Movement [s/veh] | 45.01 | 46.61 | 29.42 | 53.55 | 53.55 | 53.55 | 53.97 | 24.16 | 24.18 | 52.84 | 14.03 | 0.53 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Movement LOS | D | D | C | D | D | D | D | C | C | D | B | A |
| d_A, Approach Delay [s/veh] | 36.08 | | | 53.55 | | | 25.79 | | | 18.57 | | |
| Approach LOS | D | | | D | | | C | | | B | | |
| d_I, Intersection Delay [s/veh] | 28.39 | | | | | | | | | | | |
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.694 | | | | | | | | | | | |

**Sequence**

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | 7 | 8 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |




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**Intersection Level Of Service Report**
**Intersection 17: US 101 SB Ramps/Old Redwood Hwy**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 23.6 |
| Analysis Method: | HCM 2010 | Level Of Service: | C |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.642 |

**Intersection Setup**

| Name | | | | US 101 SB Ramps | | | Old Redwood Hwy | | | Old Redwood Hwy | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | | | | | | | | | | | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Pocket | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 0 |
| Pocket Length [ft] | 100.00 | 100.00 | 100.00 | 450.00 | 100.00 | 40.00 | 100.00 | 100.00 | 200.00 | 400.00 | 100.00 | 100.00 |
| Speed [mph] | 30.00 | | | 35.00 | | | 35.00 | | | 35.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | No | | | No | | | No | | | No | | |

**Volumes**

| Name | | | | US 101 SB Ramps | | | Old Redwood Hwy | | | Old Redwood Hwy | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 0 | 0 | 0 | 301 | 2 | 221 | 0 | 612 | 501 | 443 | 1121 | 0 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Rate | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 13 | 0 | 34 | 20 | 0 | 38 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right-Turn on Red Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 66 | 0 | 0 | 150 | 0 | 0 | 0 |
| Total Hourly Volume [veh/h] | 0 | 0 | 0 | 301 | 2 | 168 | 0 | 646 | 371 | 443 | 1159 | 0 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 0 | 0 | 0 | 75 | 1 | 42 | 0 | 162 | 93 | 111 | 290 | 0 |
| Total Analysis Volume [veh/h] | 0 | 0 | 0 | 301 | 2 | 168 | 0 | 646 | 371 | 443 | 1159 | 0 |
| Presence of On-Street Parking | | | | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |



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**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | 1 - Central Windsor |
| Cycle Length [s] | 112 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 48.5 |
| Offset Reference | LeadGreen |
| Permissive Mode | SingleBand |
| Lost time [s] | 9.00 |

**Phasing & Timing**

| Control Type | Permiss | Protecte | Permiss | Split | Split | Split | Permiss | Permiss | Permiss | Protecte | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal group | 0 | 0 | 0 | 0 | 8 | 0 | 0 | 6 | 0 | 5 | 2 | 0 |
| Auxiliary Signal Groups | | | | | | | | | | | | |
| Lead / Lag | - | - | - | - | - | - | - | - | - | Lead | - | - |
| Minimum Green [s] | 0 | 0 | 0 | 0 | 5 | 0 | 0 | 5 | 0 | 5 | 5 | 0 |
| Maximum Green [s] | 0 | 0 | 0 | 0 | 30 | 0 | 0 | 30 | 0 | 30 | 30 | 0 |
| Amber [s] | 0.0 | 0.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| All red [s] | 0.0 | 0.0 | 0.0 | 0.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 | 1.0 | 1.0 | 0.0 |
| Split [s] | 0 | 0 | 0 | 0 | 17 | 0 | 0 | 48 | 0 | 47 | 95 | 0 |
| Vehicle Extension [s] | 0.0 | 0.0 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pedestrian Clearance [s] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Rest In Walk | | | | | No | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 0.0 | 0.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 0.0 | 0.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 0.0 |
| Minimum Recall | | | | | No | | | No | | No | No | |
| Maximum Recall | | | | | No | | | No | | No | No | |
| Pedestrian Recall | | | | | No | | | No | | No | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

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**Lane Group Calculations**

| Lane Group | | L | C | R | C | R | L | C |
|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | | 112 | 112 | 112 | 112 | 112 | 112 | 112 |
| L, Total Lost Time per Cycle [s] | | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | | 13 | 13 | 13 | 57 | 57 | 30 | 91 |
| g / C, Green / Cycle | | 0.12 | 0.12 | 0.12 | 0.51 | 0.51 | 0.27 | 0.81 |
| (v / s)_i Volume / Saturation Flow Rate | | 0.09 | 0.09 | 0.11 | 0.18 | 0.23 | 0.25 | 0.33 |
| s, saturation flow rate [veh/h] | | 1774 | 1775 | 1583 | 3547 | 1583 | 1774 | 3547 |
| c, Capacity [veh/h] | | 206 | 207 | 184 | 1798 | 803 | 478 | 2881 |
| d1, Uniform Delay [s] | | 47.80 | 47.80 | 48.91 | 16.64 | 17.77 | 39.83 | 2.93 |
| k, delay calibration | | 0.11 | 0.11 | 0.11 | 0.50 | 0.50 | 0.20 | 0.50 |
| I, Upstream Filtering Factor | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | | 4.98 | 4.98 | 15.66 | 0.56 | 1.91 | 13.68 | 0.42 |
| d3, Initial Queue Delay [s] | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | | 0.73 | 0.73 | 0.91 | 0.36 | 0.46 | 0.93 | 0.40 |
| d, Delay for Lane Group [s/veh] | | 52.78 | 52.78 | 64.56 | 17.20 | 19.68 | 53.51 | 3.35 |
| Lane Group LOS | | D | D | E | B | B | D | A |
| Critical Lane Group | | No | No | Yes | No | Yes | Yes | No |
| 50th-Percentile Queue Length [veh/ln] | | 4.32 | 4.33 | 5.38 | 4.97 | 6.35 | 13.40 | 2.52 |
| 50th-Percentile Queue Length [ft/ln] | | 108.08 | 108.14 | 134.59 | 124.17 | 158.70 | 334.94 | 62.88 |
| 95th-Percentile Queue Length [veh/ln] | | 7.73 | 7.74 | 9.19 | 8.62 | 10.48 | 19.40 | 4.53 |
| 95th-Percentile Queue Length [ft/ln] | | 193.33 | 193.42 | 229.72 | 215.54 | 262.00 | 485.02 | 113.19 |



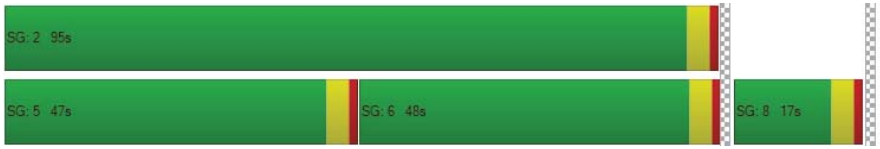
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**Movement, Approach, & Intersection Results**

| d_M, Delay for Movement [s/veh] | 0.00 | 0.00 | 0.00 | 52.78 | 52.78 | 64.56 | 0.00 | 17.20 | 19.68 | 53.51 | 3.35 | 0.00 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Movement LOS | | | | D | D | E | | B | B | D | A | |
| d_A, Approach Delay [s/veh] | 0.00 | | | 56.98 | | | 18.10 | | | 17.22 | | |
| Approach LOS | A | | | E | | | B | | | B | | |
| d_I, Intersection Delay [s/veh] | 23.57 | | | | | | | | | | | |
| Intersection LOS | C | | | | | | | | | | | |
| Intersection V/C | 0.642 | | | | | | | | | | | |

**Sequence**

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | - | 2 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | 5 | 6 | - | 8 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |




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**Intersection Level Of Service Report**
**Intersection 18: Old Redwood Hwy/US 101 NB Ramp-Lakewood Dr**

| | | | |
|---|---|---|---|
| Control Type: | Signalized | Delay (sec / veh): | 59.2 |
| Analysis Method: | HCM 2010 | Level Of Service: | E |
| Analysis Period: | 15 minutes | Volume to Capacity (v/c): | 0.736 |

**Intersection Setup**

| Name | US 101 NB Ramp | | | Lakewood Dr | | | Old Redwood Hwy | | | Old Redwood Hwy | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approach | Northbound | | | Southbound | | | Eastbound | | | Westbound | | |
| Lane Configuration | | | | | | | | | | | | |
| Turning Movement | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right |
| Lane Width [ft] | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 | 12.00 |
| No. of Lanes in Pocket | 1 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pocket Length [ft] | 250.00 | 100.00 | 150.00 | 180.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| Speed [mph] | 35.00 | | | 35.00 | | | 35.00 | | | 35.00 | | |
| Grade [%] | 0.00 | | | 0.00 | | | 0.00 | | | 0.00 | | |
| Crosswalk | No | | | No | | | No | | | No | | |

**Volumes**

| Name | US 101 NB Ramp | | | Lakewood Dr | | | Old Redwood Hwy | | | Old Redwood Hwy | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base Volume Input [veh/h] | 528 | 539 | 303 | 386 | 0 | 618 | 309 | 672 | 0 | 0 | 715 | 270 |
| Base Volume Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Heavy Vehicles Percentage [%] | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| Growth Rate | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| In-Process Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Site-Generated Trips [veh/h] | 19 | 0 | 0 | 0 | 0 | 0 | 0 | 21 | 0 | 0 | 19 | 0 |
| Diverted Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pass-by Trips [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Site Adjustment Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other Volume [veh/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Right-Turn on Red Volume [veh/h] | 0 | 0 | 91 | 0 | 0 | 185 | 0 | 0 | 0 | 0 | 0 | 81 |
| Total Hourly Volume [veh/h] | 547 | 539 | 212 | 386 | 0 | 433 | 309 | 693 | 0 | 0 | 734 | 189 |
| Peak Hour Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Other Adjustment Factor | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total 15-Minute Volume [veh/h] | 137 | 135 | 53 | 97 | 0 | 108 | 77 | 173 | 0 | 0 | 184 | 47 |
| Total Analysis Volume [veh/h] | 547 | 539 | 212 | 386 | 0 | 433 | 309 | 693 | 0 | 0 | 734 | 189 |
| Presence of On-Street Parking | No | | No | No | | No | No | | No | No | | No |
| On-Street Parking Maneuver Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Local Bus Stopping Rate [/h] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pedestrian Volume [ped/h] | 0 | | | 0 | | | 0 | | | 0 | | |
| Bicycle Volume [bicycles/h] | 0 | | | 0 | | | 0 | | | 0 | | |



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**Intersection Settings**

| | |
|---|---|
| Located in CBD | No |
| Signal Coordination Group | 1 - Central Windsor |
| Cycle Length [s] | 112 |
| Coordination Type | Time of Day Pattern Coordinated |
| Actuation Type | Fully actuated |
| Offset [s] | 112.0 |
| Offset Reference | LeadGreen |
| Permissive Mode | SingleBand |
| Lost time [s] | 12.00 |

**Phasing & Timing**

| Control Type | Split | Split | Split | Permiss | Protecte | Overlap | Protecte | Permiss | Permiss | Permiss | Permiss | Permiss |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Signal group | 0 | 7 | 0 | 8 | 0 | 1 | 1 | 6 | 0 | 0 | 2 | 0 |
| Auxiliary Signal Groups | | | | | | 1,8 | | | | | | |
| Lead / Lag | - | - | - | Lead | - | - | Lead | - | - | - | - | - |
| Minimum Green [s] | 0 | 5 | 0 | 5 | 0 | 5 | 5 | 5 | 0 | 0 | 5 | 0 |
| Maximum Green [s] | 0 | 30 | 0 | 30 | 0 | 30 | 30 | 30 | 0 | 0 | 30 | 0 |
| Amber [s] | 0.0 | 3.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 |
| All red [s] | 0.0 | 1.0 | 0.0 | 1.0 | 0.0 | 1.0 | 1.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 |
| Split [s] | 0 | 34 | 0 | 15 | 0 | 29 | 29 | 63 | 0 | 0 | 34 | 0 |
| Vehicle Extension [s] | 0.0 | 3.0 | 0.0 | 3.0 | 0.0 | 3.0 | 3.0 | 3.0 | 0.0 | 0.0 | 3.0 | 0.0 |
| Walk [s] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pedestrian Clearance [s] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Rest In Walk | | No | | No | | | | No | | | No | |
| I1, Start-Up Lost Time [s] | 0.0 | 2.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 |
| I2, Clearance Lost Time [s] | 0.0 | 2.0 | 0.0 | 2.0 | 0.0 | 2.0 | 2.0 | 2.0 | 0.0 | 0.0 | 2.0 | 0.0 |
| Minimum Recall | | No | | No | | No | No | No | | | No | |
| Maximum Recall | | No | | No | | No | No | No | | | No | |
| Pedestrian Recall | | No | | No | | No | No | No | | | No | |
| Detector Location [ft] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Detector Length [ft] | 0.0 | 50.0 | 0.0 | 0.0 | 0.0 | 0.0 | 50.0 | 50.0 | 0.0 | 0.0 | 50.0 | 0.0 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Exclusive Pedestrian Phase**

| | |
|---|---|
| Pedestrian Signal Group | 0 |
| Pedestrian Walk [s] | 0 |
| Pedestrian Clearance [s] | 0 |

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**Lane Group Calculations**

| Lane Group | L | C | C | L | R | L | C | C | C |
|---|---|---|---|---|---|---|---|---|---|
| C, Cycle Length [s] | 112 | 112 | 112 | 112 | 112 | 112 | 112 | 112 | 112 |
| L, Total Lost Time per Cycle [s] | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| l1_p, Permitted Start-Up Lost Time [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| l2, Clearance Lost Time [s] | 2.00 | 2.00 | 2.00 | 2.00 | 0.00 | 2.00 | 2.00 | 2.00 | 2.00 |
| g_i, Effective Green Time [s] | 30 | 30 | 30 | 11 | 40 | 25 | 59 | 30 | 30 |
| g / C, Green / Cycle | 0.27 | 0.27 | 0.27 | 0.10 | 0.36 | 0.22 | 0.53 | 0.27 | 0.27 |
| (v / s)_i Volume / Saturation Flow Rate | 0.25 | 0.25 | 0.25 | 0.11 | 0.27 | 0.09 | 0.37 | 0.25 | 0.27 |
| s, saturation flow rate [veh/h] | 1774 | 1843 | 1547 | 3445 | 1583 | 3445 | 1863 | 1863 | 1737 |
| c, Capacity [veh/h] | 474 | 492 | 413 | 341 | 567 | 770 | 981 | 499 | 465 |
| d1, Uniform Delay [s] | 40.21 | 40.16 | 40.27 | 48.65 | 25.38 | 37.12 | 19.98 | 39.96 | 40.94 |
| k, delay calibration | 0.41 | 0.40 | 0.41 | 0.11 | 0.50 | 0.50 | 0.50 | 0.40 | 0.45 |
| I, Upstream Filtering Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| d2, Incremental Delay [s] | 25.26 | 23.88 | 28.55 | 67.94 | 9.42 | 1.56 | 4.27 | 21.65 | 37.63 |
| d3, Initial Queue Delay [s] | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Rp, platoon ratio | 1.00 | 1.00 | 1.00 | 1.33 | 1.33 | 1.00 | 1.00 | 1.00 | 1.00 |
| PF, progression factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

**Lane Group Results**

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| X, volume / capacity | 0.94 | 0.94 | 0.95 | 1.13 | 0.76 | 0.40 | 0.71 | 0.93 | 0.99 |
| d, Delay for Lane Group [s/veh] | 65.47 | 64.04 | 68.82 | 116.59 | 34.79 | 38.68 | 24.25 | 61.61 | 78.57 |
| Lane Group LOS | E | E | E | F | C | D | C | E | E |
| Critical Lane Group | No | No | Yes | No | Yes | No | No | No | Yes |
| 50th-Percentile Queue Length [veh/ln] | 15.06 | 15.39 | 13.57 | 7.75 | 9.28 | 3.74 | 13.98 | 15.07 | 17.23 |
| 50th-Percentile Queue Length [ft/ln] | 376.54 | 384.71 | 339.32 | 193.64 | 232.09 | 93.51 | 349.49 | 376.80 | 430.70 |
| 95th-Percentile Queue Length [veh/ln] | 21.43 | 21.82 | 19.61 | 12.88 | 14.28 | 6.73 | 20.11 | 21.44 | 24.04 |
| 95th-Percentile Queue Length [ft/ln] | 535.66 | 545.55 | 490.37 | 321.89 | 357.02 | 168.32 | 502.79 | 535.97 | 600.88 |



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**Movement, Approach, & Intersection Results**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| d_M, Delay for Movement [s/veh] | 65.16 | 65.62 | 68.82 | 116.59 | 0.00 | 34.79 | 38.68 | 24.25 | 0.00 | 0.00 | 67.91 | 78.57 |
| Movement LOS | E | E | E | F | | C | D | C | | | E | E |
| d_A, Approach Delay [s/veh] | 65.97 | | | 73.34 | | | 28.70 | | | 70.09 | | |
| Approach LOS | E | | | E | | | C | | | E | | |
| d_I, Intersection Delay [s/veh] | 59.17 | | | | | | | | | | | |
| Intersection LOS | E | | | | | | | | | | | |
| Intersection V/C | 0.736 | | | | | | | | | | | |

**Sequence**

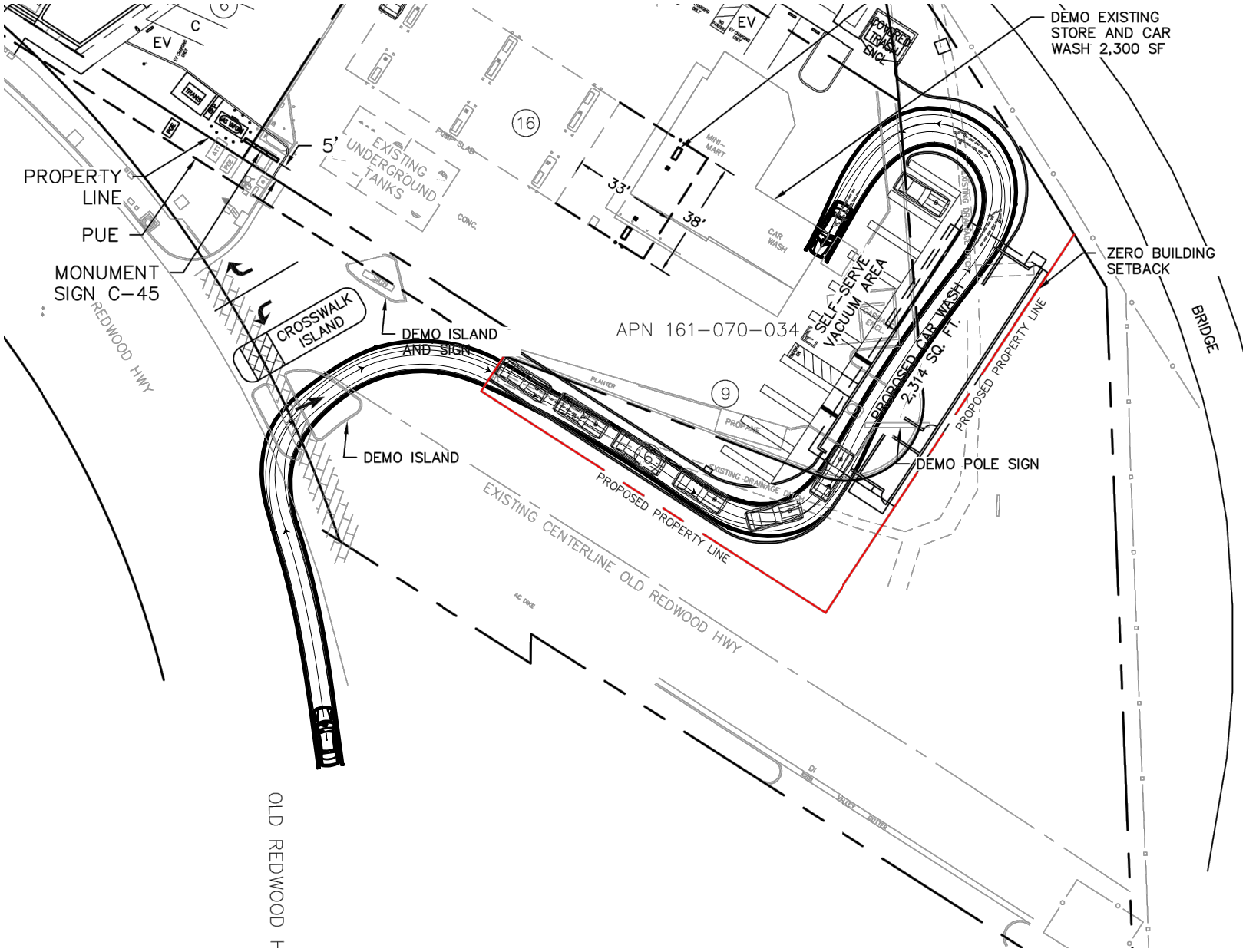
| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ring 1 | 1 | 2 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 2 | - | 6 | 7 | 8 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ring 4 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

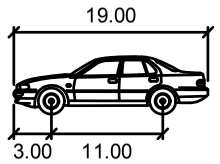



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# Appendix D

## Passenger Car AutoTURN Exhibit




P

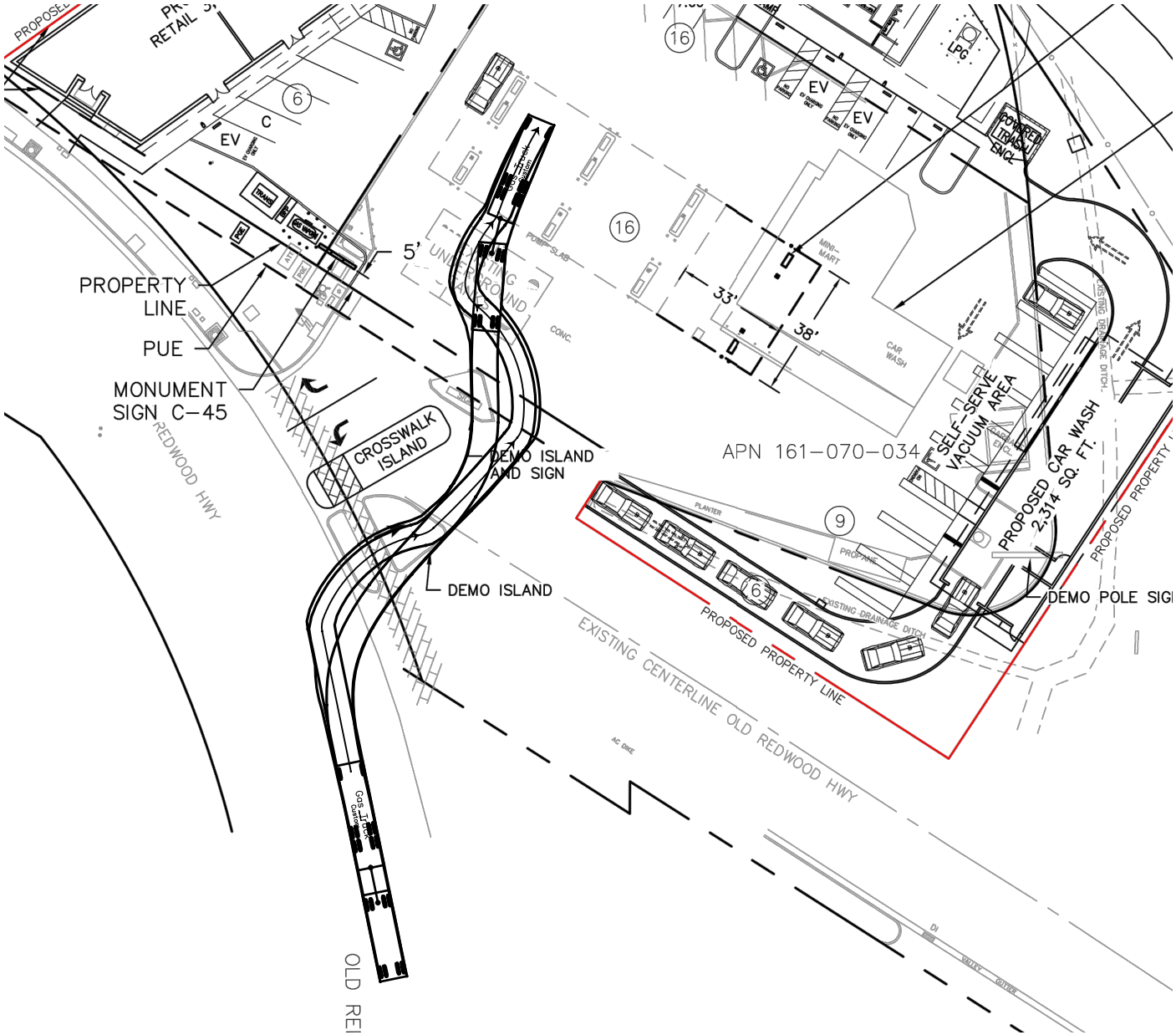
| | feet |
|---|---|
| Width | : 7.00 |
| Track | : 6.00 |
| Lock to Lock Time | : 6.0 |
| Steering Angle | : 31.6 |

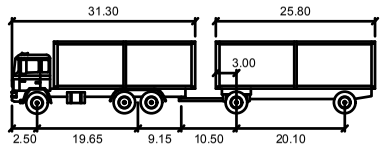
# Chevron Remodel TIS

## AutoTURN Exhibit - Passenger Car

WIN128

June 2018




Gas Truck

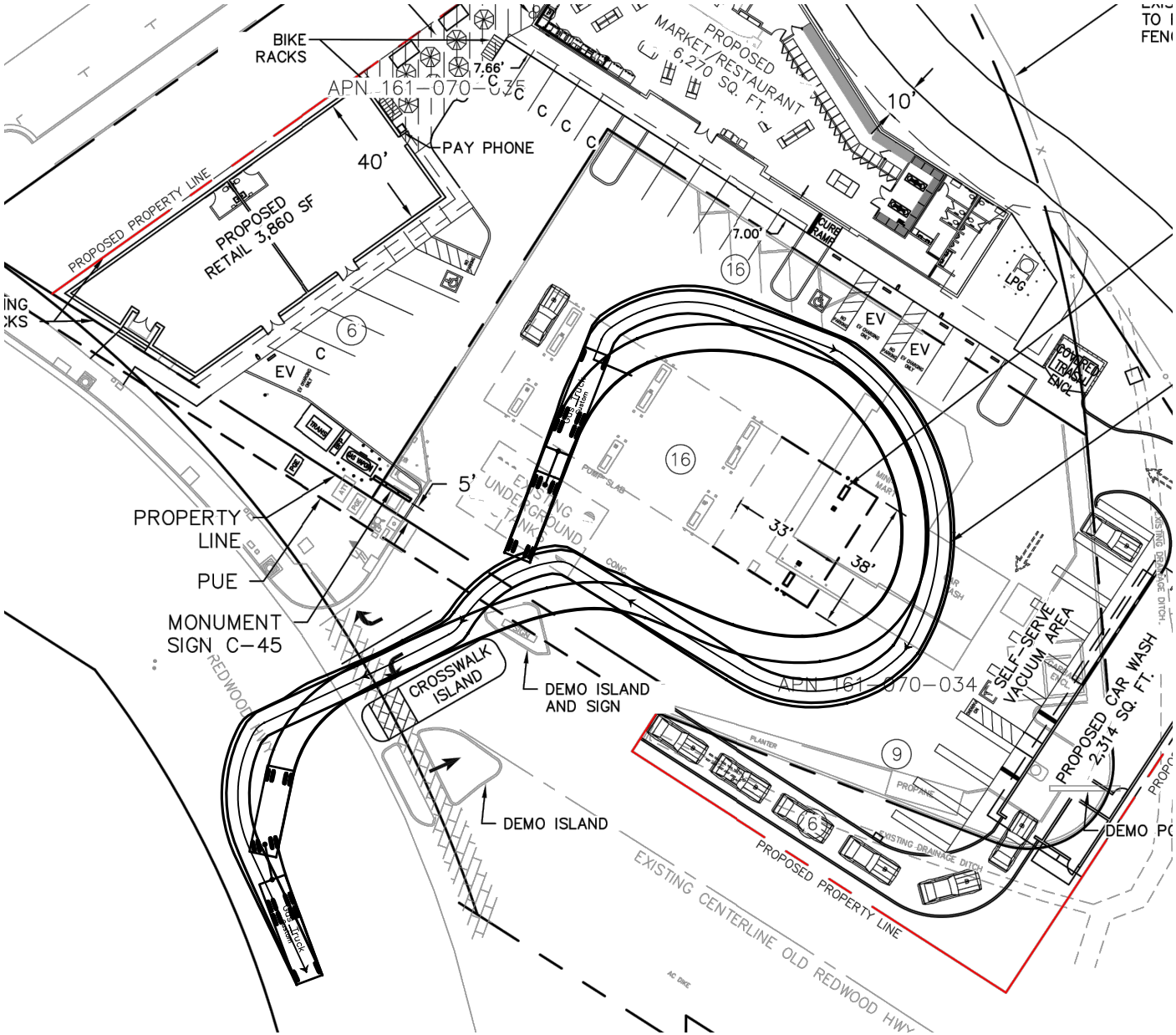
| | feet | | |
|---|---|---|---|
| First Unit Width | : 8.00 | Lock to Lock Time | : 6.0 |
| Trailer Width | : 8.00 | Steering Angle | : 31.1 |
| First Unit Track | : 7.62 | Articulating Angle | : 70.0 |
| Trailer Track | : 7.62 | | |

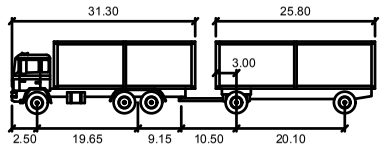
# Chevron Remodel TIS

## AutoTURN Exhibit - Inbound Fuel Tanker

WIN128

June 2018




Gas Truck

| | feet | | |
|---|---|---|---|
| First Unit Width | : 8.00 | Lock to Lock Time | : 6.0 |
| Trailer Width | : 8.00 | Steering Angle | : 31.1 |
| First Unit Track | : 7.62 | Articulating Angle | : 70.0 |
| Trailer Track | : 7.62 | | |

# Chevron Remodel TIS

## AutoTURN Exhibit - Outbound Fuel Tanker

WIN128

June 2018