

**Appendix B:**

**Technical Memorandum #2: Existing  
Conditions Analysis**



**US 26/Brookwood Parkway/Helvetia Road  
Interchange Area Management Plan**

**Hillsboro and Washington County, Oregon**

**Technical Memorandum #2:  
Existing Conditions Analysis  
Revised Draft**

**Prepared for**

Oregon Department of Transportation, Region 1  
123 NW Flanders Street  
Portland, Oregon 97209-4012

**Prepared by**

David Evans and Associates, Inc.  
2100 SW River Parkway  
Portland, Oregon 97201



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## List of Acronyms

ADT	Average Daily Traffic
AF	Agriculture and Forest
API	Area of Potential Influence
ATR	automatic traffic recorder
BPA	Bonneville Power Administration
DPS	Distinct Population Segment
EBR	Shute Road Interchange Improvement Project Environmental Baseline Report
EFU	Exclusive Farm Use
ESH	Essential Salmonid Habitat
FD-20	Future development
FEMA	Federal Emergency Management Agency
GIS	geographic information system
HCM	Highway Capacity Manual
HCS	Highway Capacity Software
HUC	Hydrologic Unit Code
IAMP	Interchange Area Management Plan
JTA	Jobs and Transportation Act
LLC	limited liability corporation
LOS	Level of Service
LUST	Leaking Underground Storage Tank
LWCF	Land and Water Conservation Fund
mev	million vehicle miles
MP	mile point
mvm	million vehicle miles
NRHP	National Register of Historic Places
ODFW	Oregon Department of Fish and Wildlife
ODOT	Oregon Department of Transportation
OHP	Oregon Highway Plan
ORBIC	Oregon Biological Information Center
ORNHIC	Oregon Natural Heritage Information Center

PDO	property-damage-only
SHPO	State Historic Preservation Office
SID	Special Industrial District
SPIS	Safety Priority Index System
SV	Sensitive Vulnerable
T	Threatened
T&E	Threatened and Endangered
UGB	Urban Growth Boundary
URA	Urban Reserve Area
USFWS	United States Fish and Wildlife Service
UWR	Upper Willamette River
v/c	volume-to-capacity

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## 1. PURPOSE AND STUDY AREA

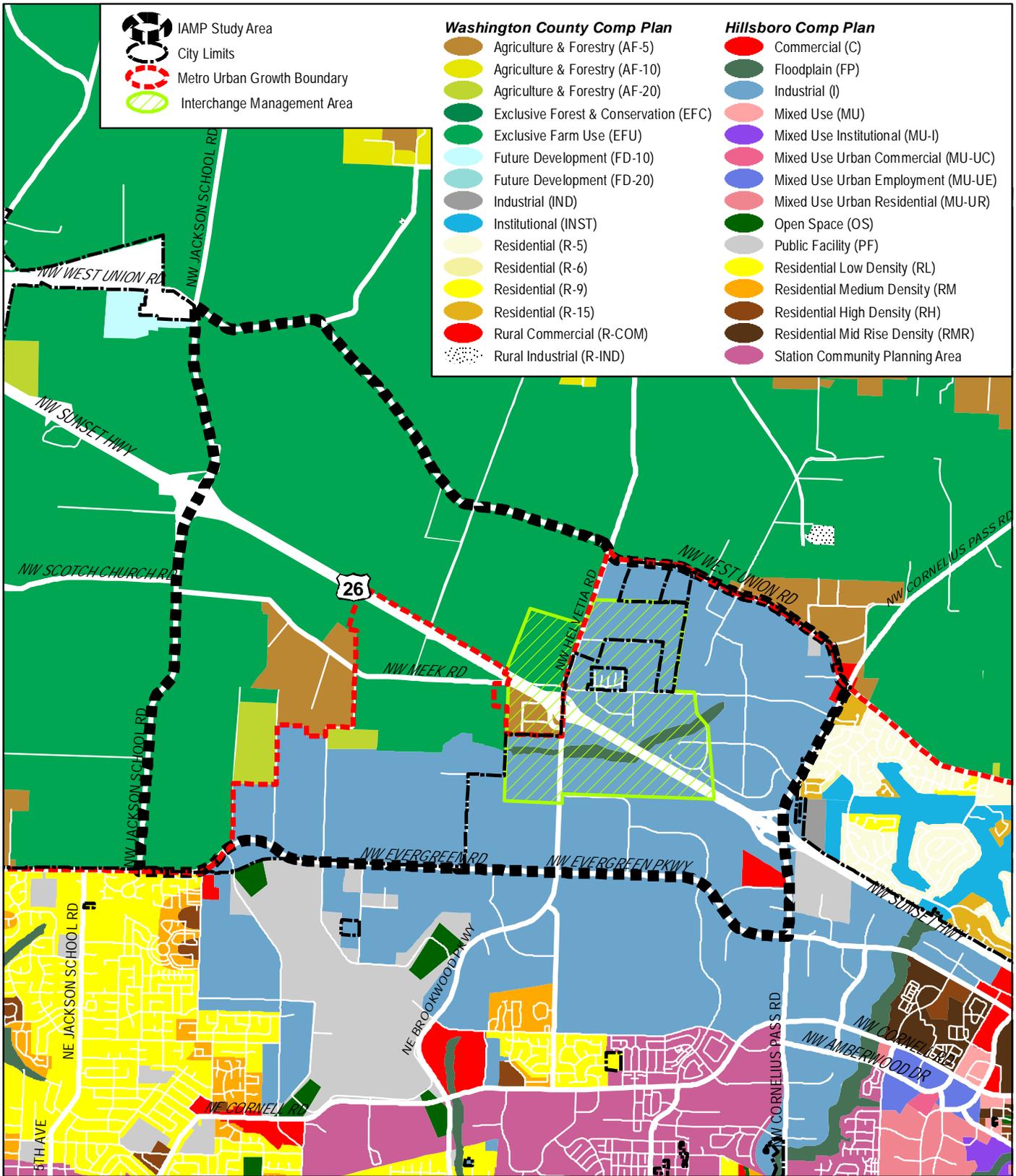
The Oregon Department of Transportation (ODOT) is modifying the Brookwood Parkway/Helvetia Road interchange on US 26 as part of the US 26/Brookwood Jobs and Transportation Act (JTA) Project; therefore, ODOT is required to adopt an Interchange Area Management Plan (IAMP) for the interchange. US 26 is locally and regionally significant in moving people, goods, and services through North Hillsboro and throughout the metropolitan region and the state. The US 26/Brookwood Parkway/Helvetia Road interchange has been serving and will continue to serve as a major entry point to large high-technology employment centers based throughout North Hillsboro.

The US 26/Brookwood Parkway/Helvetia Road interchange is currently approaching or exceeding the mobility standards identified in the Oregon Highway Plan (OHP) for this facility. The heavy westbound off-ramp traffic during the AM peak hour heading southbound and the corresponding northbound-to-eastbound movement in the PM peak hour are of primary concern. Local road connections to Brookwood Parkway and Helvetia Road near the interchange do not meet OHP access spacing standards, and the proximity of the local road connections to the interchange make local road access difficult and contribute to traffic congestion at and near the interchange during peak travel times. Traffic at the US 26/Brookwood Parkway/Helvetia Road interchange is projected to increase as new industrial development is attracted to North Hillsboro.

The purpose of the IAMP is to:

- Support the ongoing and future City of Hillsboro and Washington County transportation, land use, and economic development planning efforts in and around the Study Area, as described below (North Hillsboro); and
- Protect the future function of the interchange.

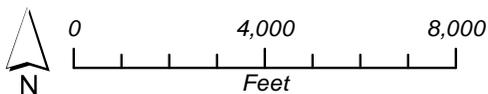
This technical memorandum identifies existing land use, transportation, and natural and historic resources within the Study Area. The Study Area includes the segment of US 26, accompanying local road networks, and land encompassed by Cornelius Pass Road (at US 26 mile point [MP] 62.53) on the east, Evergreen Road on the south, Jackson School Road (at US 26 MP 58.42) on the west, and West Union Road on the north, as shown in **Figure 1**.



**US 26/Brookwood Parkway/  
Helvetia Road IAMP**



**Figure 1**  
Comprehensive Plan  
Designations



**Data Sources:**  
Metro RLIS GIS Data, 2011

## 2. EXISTING LAND USE ANALYSIS

### Introduction

This section summarizes existing land use conditions within the Study Area. The information in this section is taken primarily from published documents, maps, geographic information system (GIS) data, city and county websites, and other resource websites. **Figure 1** shows the comprehensive plan designations in the study area. **Figure 2** shows the zoning designations.

The Study Area represents the western developed edge of the Portland Metropolitan area, with large areas of farmland mostly to the west, and which is adjacent to industrial areas and residential development to the east. The interchange is a critical access point, serving the mobility needs for high-tech and supporting companies located both inside and outside of the Study Area including Intel, Genentech, SolarWorld, TriQuint Semiconductor, Tokai Carbon USA, and Tokyo Ohka Kogyo America (TOK America). Hillsboro Airport, Oregon's second busiest airport, is just south of the Study Area.

### Jurisdictions

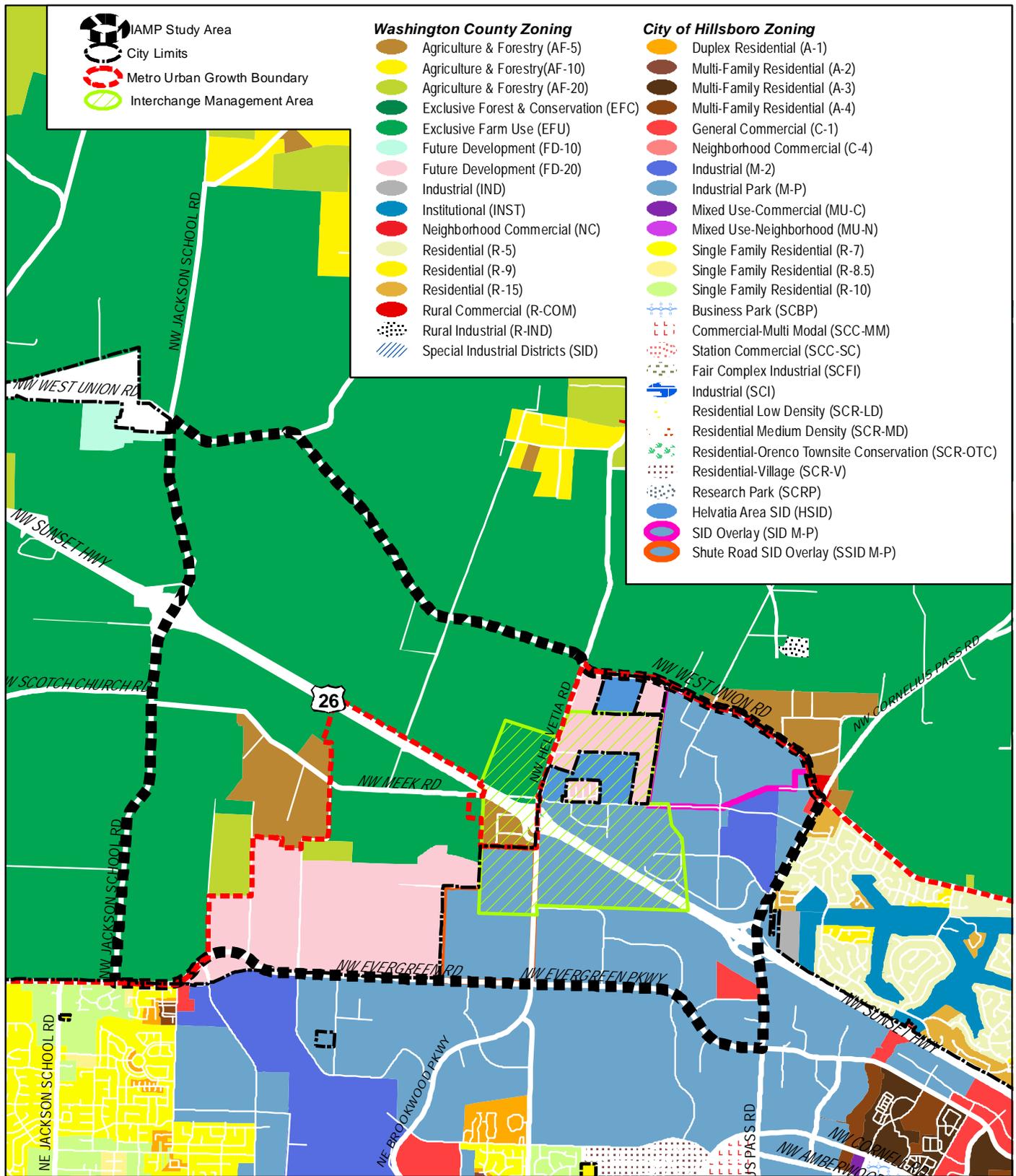
The US 26/Brookwood Parkway/Helvetia Road interchange is located within both the City of Hillsboro and Washington County jurisdictional boundaries. The majority of the west Study Area is within Washington County jurisdiction, except for a southern portion of the Study Area east of 253<sup>rd</sup> Avenue and south of Birch Avenue, which is in the City of Hillsboro jurisdiction. The east Study Area is within City of Hillsboro jurisdiction, except for several parcels north of the interchange that are adjacent to or near Helvetia Road.

### Urban Growth Boundary

The current western edge of the Urban Growth Boundary (UGB) north of US 26 (which is within the Study Area) follows Helvetia Road, with the northern edge following West Union Road. South of US 26, the western edge of the UGB zigzags around parcel lines south and west of Birch Avenue. There are two Urban Reserve Areas (URAs) in the Study Area. One area is north of the interchange adjacent to US 26 and west of Helvetia Road, and one area is south of the interchange, adjacent to and south of US 26, and follows the eastern edge of McKay Creek. The URA north of the interchange was recently expanded to include an additional 352 acres south of West Union Road and east of Groveland Road (see **Figure 3**).

Metro requires that, before adding land into the UGB, the local jurisdiction must meet Urban Growth Management Functional Plan Title 14: Urban Growth Boundary criteria and procedures for amendments to the UGB. The City of Hillsboro currently has submitted Title 14 documentation to request that 310 acres be added to the UGB in the URA south of US 26 in the Study Area.

Once an area is added to the UGB, the local jurisdiction must provide documentation that the comprehensive plan amendment is consistent with all applicable titles of the Urban Growth Management Functional Plan. Title 11 of the Urban Growth Management Functional Plan lists



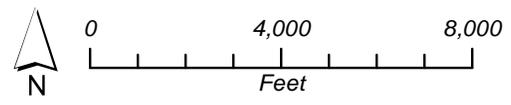
- IAMP Study Area
- City Limits
- Metro Urban Growth Boundary
- Interchange Management Area

- Washington County Zoning**
- Agriculture & Forestry (AF-5)
  - Agriculture & Forestry (AF-10)
  - Agriculture & Forestry (AF-20)
  - Exclusive Forest & Conservation (EFC)
  - Exclusive Farm Use (EFU)
  - Future Development (FD-10)
  - Future Development (FD-20)
  - Industrial (IND)
  - Institutional (INST)
  - Neighborhood Commercial (NC)
  - Residential (R-5)
  - Residential (R-9)
  - Residential (R-15)
  - Rural Commercial (R-COM)
  - Rural Industrial (R-IND)
  - Special Industrial Districts (SID)

- City of Hillsboro Zoning**
- Duplex Residential (A-1)
  - Multi-Family Residential (A-2)
  - Multi-Family Residential (A-3)
  - Multi-Family Residential (A-4)
  - General Commercial (C-1)
  - Neighborhood Commercial (C-4)
  - Industrial (M-2)
  - Industrial Park (M-P)
  - Mixed Use-Commercial (MU-C)
  - Mixed Use-Neighborhood (MU-N)
  - Single Family Residential (R-7)
  - Single Family Residential (R-8.5)
  - Single Family Residential (R-10)
  - Business Park (SCBP)
  - Commercial-Multi Modal (SCC-MM)
  - Station Commercial (SCC-SC)
  - Fair Complex Industrial (SCFI)
  - Industrial (SCI)
  - Residential Low Density (SCR-LD)
  - Residential Medium Density (SCR-MD)
  - Residential-Orengo Townsite Conservation (SCR-OTC)
  - Residential-Village (SCR-V)
  - Research Park (SCR-P)
  - Helvetia Area SID (HSID)
  - SID Overlay (SID M-P)
  - Shute Road SID Overlay (SSID M-P)

**US 26/Brookwood Parkway/  
Helvetia Road IAMP**

**Figure 2**  
Zoning Designations



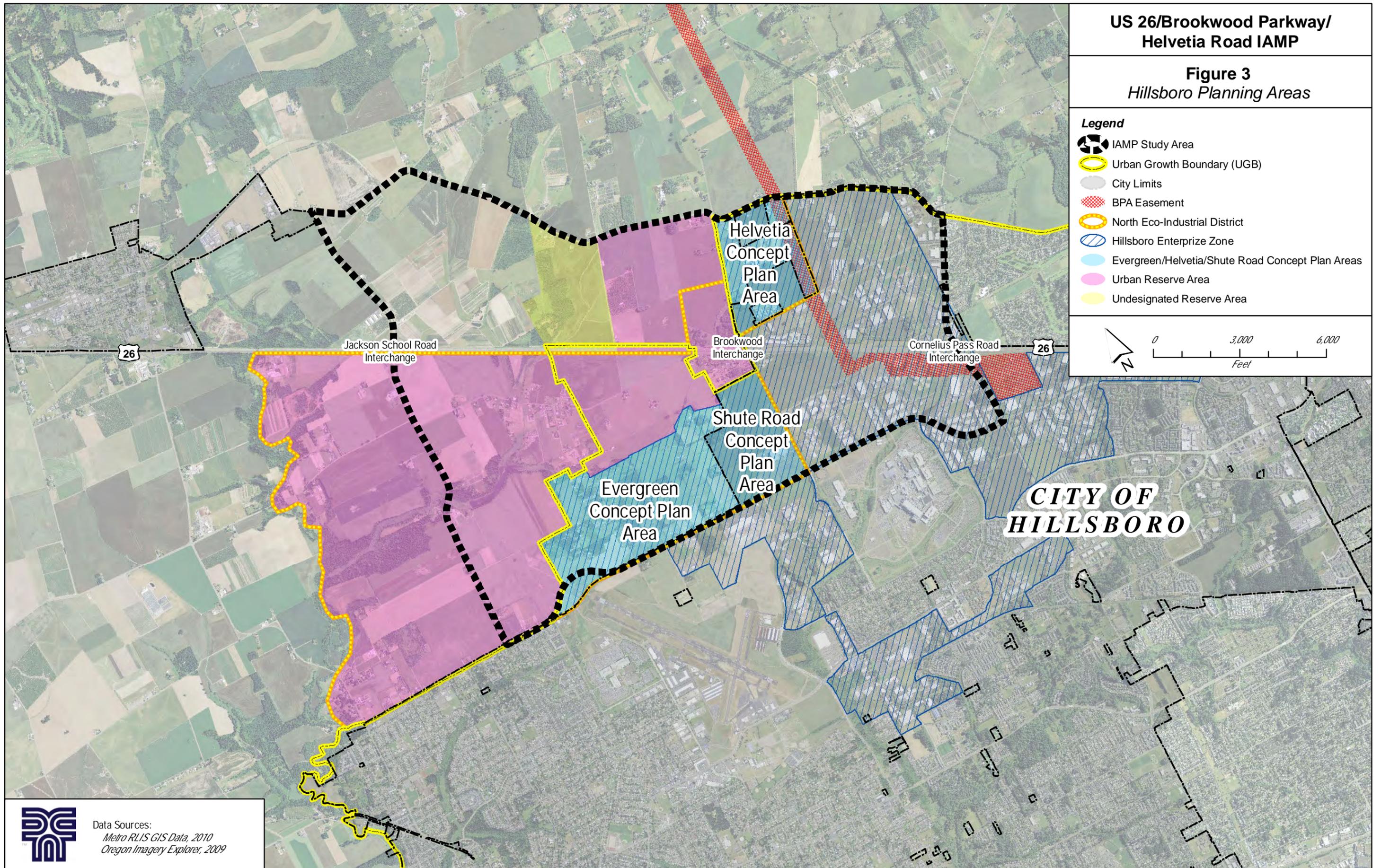
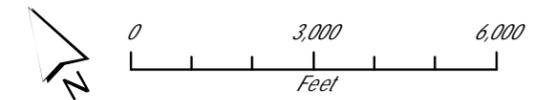
**Data Sources:**  
Metro RLIS GIS Data, 2011

**US 26/Brookwood Parkway/  
Helvetia Road IAMP**

**Figure 3**  
*Hillsboro Planning Areas*

**Legend**

-  IAMP Study Area
-  Urban Growth Boundary (UGB)
-  City Limits
-  BPA Easement
-  North Eco-Industrial District
-  Hillsboro Enterprize Zone
-  Evergreen/Helvetia/Shute Road Concept Plan Areas
-  Urban Reserve Area
-  Undesignated Reserve Area



Data Sources:  
*Metro RLIS GIS Data, 2010*  
*Oregon Imagery Explorer, 2009*

provisions that need to be addressed in the comprehensive plan amendment, including an urban growth plan diagram and policies consistent with the Regional Framework Plan and adopted 2040 Growth Concept design types. The City of Hillsboro has completed concept planning for the Evergreen, Shute, and Helvetia areas within the Study Area, as required under Metro's Title 11 of the Urban Growth Management Functional Plan. The majority of the Evergreen, Shute, and Helvetia concept planning areas are now within incorporated Hillsboro and are designated for industrial uses. These areas retain their rural character and many properties are actively farmed.

## Existing Land Use and Zoning

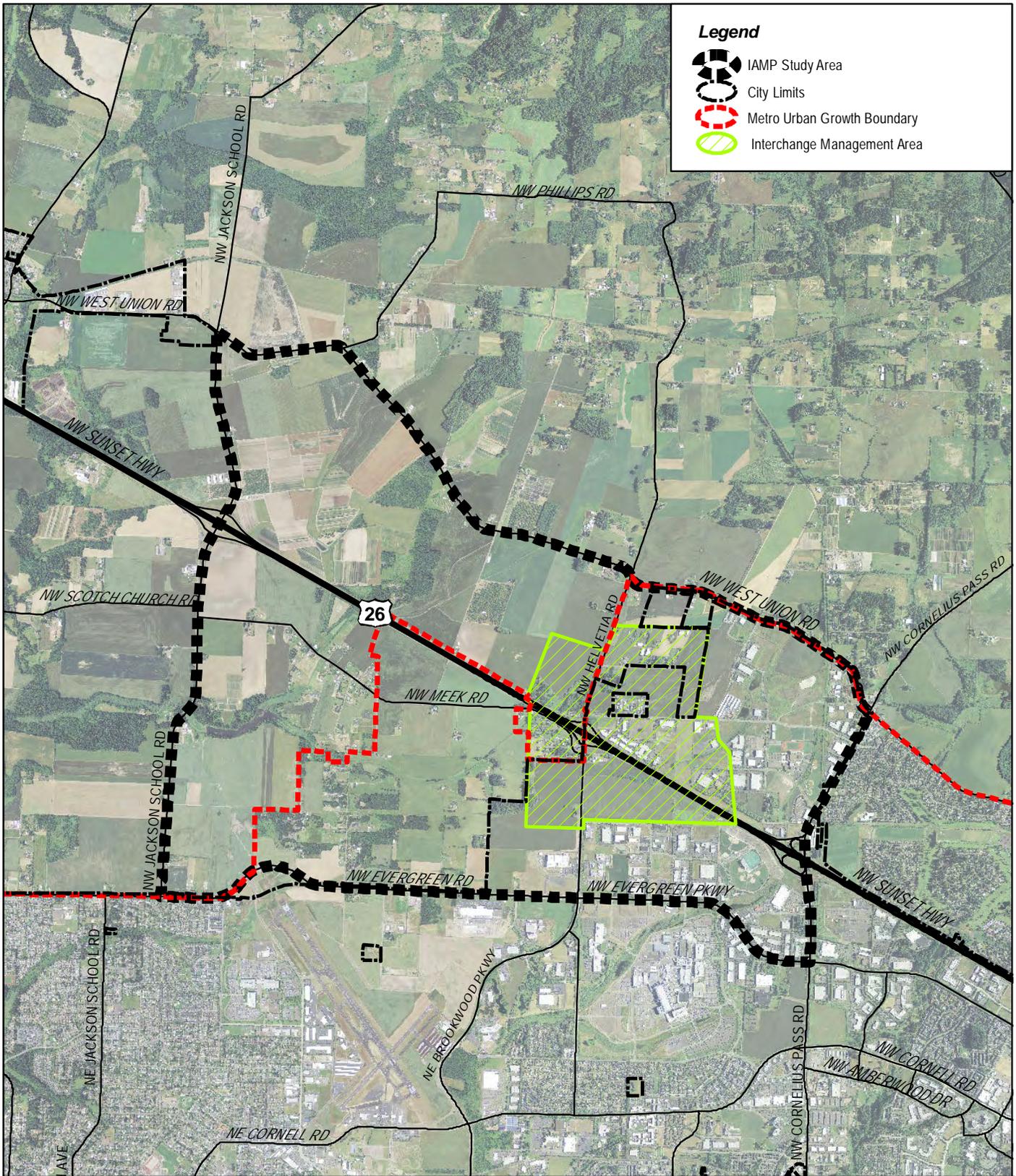
### ***Washington County—Northwest Quadrant***

Within the northwest quadrant of the interchange Study Area, current land use is primarily rural agricultural. There is some rural residential, mostly adjacent to Groveland Drive and between Groveland Drive and US 26. Aerial photography (see **Figure 4**) indicates that most of this area is currently actively farmed. West Union Elementary School is at the southwest corner of Helvetia Road and West Union Road, an automotive repair shop is at the corner of Groveland Drive and Groveland Road, and Rice Museum of Rocks and Minerals is north of Groveland Drive near its termination. Standring Groveland/Investment Co. LLC is a major owner closer to the interchange and north of smaller rural residential parcels along Groveland Drive. Farther from the interchange, major landowners are farming limited liability corporations (LLCs) such as Pasley Farms and Batchelder Farms.

Zoning in the northwest quadrant of the interchange Study Area is entirely Exclusive Farm Use. The intent of the Exclusive Farm Use District, according to the Washington County Community Development Code, is to “*preserve and maintain commercial agricultural land within the County.*” The area between Helvetia Road, Groveland Drive, US 26, and West Union Road is designated Urban Reserve, with the intent that it will become employment area and housing when needed in the future. Adjacent to and to the west of the URA is an undesignated area that is available to potentially accommodate urban growth if the nearby URAs are exhausted.

### ***Washington County—Southwest Quadrant***

The portion of the southwest quadrant of the Study Area within Washington County jurisdictional boundaries consists of rural residential uses between Meek Road, Oak Drive, and Birch Avenue. Zoning within this area supports rural residential uses (Agriculture and Forest-5 [AF-5]). Most of the parcels are owned by families or individuals, except for a parcel at the intersection of Oak Drive and Meek Road that is owned by a religious organization. Further from the interchange along US 26 and outside of the UGB is mostly rural agricultural uses west of Birch Avenue, with some areas of rural residential around 268<sup>th</sup> Place and Sewell Road mostly south of Meek Road. Parcels in this area are owned by individuals or families, and the largest single property ownership is 81.89 acres. Zoning within the area includes Exclusive Farm Use (EFU), Agriculture and Forest- 20 (AF-20), and AF-5 uses in the northern section of the Study Area around Meek Road. Agricultural and Forest areas are intended to retain an area's



**Legend**

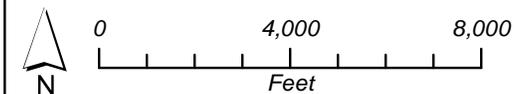
-  IAMP Study Area
-  City Limits
-  Metro Urban Growth Boundary
-  Interchange Management Area

**US 26/Brookwood Parkway/  
Helvetia Road IAMP**

**Data Sources:**  
 Metro RLIS GIS Data, 2011  
 Aerial Photograph:  
 Oregon Imagery Explorer, 2009



**Figure 4**  
 Aerial



rural character and conserve the natural resources while providing for rural residential use in areas so designated by the Comprehensive Plan. Zoning is consistent with these uses. Much of this area is also within a City of Hillsboro UGB expansion proposal, as referenced in Appendix A of Technical Memorandum #1. Most of the parcels in the area are privately owned by individuals or families. The remaining portion of the southwest quadrant of the Study Area within the UGB and Washington County jurisdiction (west of 253<sup>rd</sup> Avenue/Meier-Jurgen Road) has rural agricultural and residential uses. However, the area's comprehensive plan designation is Industrial, and it is zoned Future Development (FD-20). It also is within the Evergreen Concept Plan Area to help provide industrial land supply and future employment growth. The intent of the FD-20 District is as follows:

*The FD-20 District applies to the unincorporated urban lands added to the urban growth boundary by Metro through a Major or Legislative Amendment process after 1998. The FD-20 District recognizes the desirability of encouraging and retaining limited interim uses until the urban comprehensive planning for future urban development of these areas is complete. The provisions of this District are also intended to implement the requirements of Metro's Urban Growth Management Functional Plan.*

Portland General Electric owns approximately 30 acres on two sites: one west of Sewell Road and one west of 253<sup>rd</sup> Avenue. The Port of Portland owns a small tract of land near 273<sup>rd</sup> Avenue.

The only parcels within Washington County jurisdiction east of the interchange and Helvetia Road are zoned FD-20.

### **City of Hillsboro—Northeast Quadrant**

The northeast quadrant of the Study Area between Jacobson Road and US 26 is mostly commercial/industrial uses. North of Jacobson Road is mostly agricultural uses and vacant land, with a mobile home park directly off of Jacobson Road. The rest of the northeastern section of the Study Area is a mix of rural agricultural and commercial/industrial uses, and has more developed and mostly commercial/industrial uses closer to Cornelius Pass Road. Liberty High School is off of Wagon Way and covers a large area that includes multiple sports fields.

Land use designations for the area are entirely industrial, with a band of floodplain designation for Waibel Creek. Zoning is also industrial-based. However, the Helvetia area and most of the area along West Union Road has a Special Industrial District (SID) Overlay to "*protect and enhance development opportunities for industrial uses....*"

Parcels in the northeast quadrant of the Study Area close to the interchange are mostly parcels between 1 acre and 8 acres and are owned by individuals, families, or LLCs, including investment LLCs. Of the three largest parcels in the area, the Bonneville Power Administration (BPA) owns one that is south of Jacobson Road, between Century Boulevard and Pinefarm Place (22.09 acres); the Development Services of America owns the other large parcel (30 acres)

south of Pubols Road and west and adjacent to Century Boulevard; and Weston Investment Company LLC owns another just south of the Development Services of America parcel (16 acres). Parcels in the Study Area farther from the interchange are mostly commercially owned for industrial/commercial uses, except for one large parcel of private ownership along West Union Road close to Helvetia Road. The largest parcel owners in the area are Intel for its West Union Campus off of West Union Road and the Hillsboro School District for Liberty High School.

### ***City of Hillsboro—Southeast Quadrant***

The southeast corner of the Study Area adjacent to the interchange and north of Huffman Street is agricultural uses. The southeast Study Area beyond the agricultural area is mostly commercial/industrial uses south of Huffman Street and along 235<sup>th</sup> Avenue and Bennett Street east to Cornelius Pass Road, and is interspersed with a few smaller, undeveloped parcels. Gordon Faber recreation complex occupies a large area east of Bennett Street and west of Cornelius Pass Road adjacent to US 26.

Comprehensive Plan Map Designations for the Study Area within City of Hillsboro jurisdiction are entirely Industrial, except for a band of area designated Floodplain from Century Drive under US 26 and then to Brookwood Parkway just south of the interchange, and an area designated commercial off of Cornelius Pass Road. Zoning for the Study Area is consistent with the designations and is entirely Industrial Park (M-P), with a small area of Shute Road SID Overlay and an area of general commercial off of Cornelius Pass Road. The City of Hillsboro has also implemented a Significant Natural Resource Overlay to protect natural resources located along portions of the floodplains in the area. The Nike Foundation owns much of the land north of Huffman Street (approximately 75 acres), with one parcel owned by Ruth Berger between the Nike parcel and the interchange. Further from the interchange, the City of Hillsboro is the largest property owner for Gordon Faber Park. Other parcels are owned in support of the industrial uses and commercial and business parks.

### ***City of Hillsboro—Southwest Quadrant***

Land in the southwest quadrant is undeveloped and used for agricultural uses, except for the parcel owned by Genentech Incorporated, which is approximately 75 acres on the corner of Evergreen Parkway and Brookwood Parkway. This area is designated and zoned Industrial, with a Shute Road SID Overlay, and is within the Shute Road Concept Area.

### ***Community Features***

In the Study Area, community features include:

- Chinese Evangelical Church in the northeast quadrant at 5529 Five Oaks Drive.
- Rice Northwest Museum of Rocks and Minerals in the northwest quadrant. The museum facility (Richard and Helen Rice Residence) is listed on the National Register of Historic Places. It is recognized for its unique architectural style, use of natural stone, and native Oregon woodwork.

- West Union Elementary School at the southwest corner of Helvetia Road and West Union Road.
- Liberty High School off of Wagon Way.
- Community of Christ Church in the northeast quadrant off of Five Oaks Drive.
- Oregon Department of Environmental Quality Sunset/Hillsboro Vehicle Emission Testing Station in the northeast quadrant off of Five Oaks Drive.
- The Gordon Faber Recreation Complex west of Cornelius Pass Road, off of Bennett Road in the southeast quadrant. The complex is an athletic facility for softball, soccer, football, baseball, lacrosse, running, walking, and bicycling. The Hillsboro Airport and Hillsboro Public Library are just south of the Study Area off of Brookwood Parkway.

### ***Adjacent Tax Lot Summary***

A review of property and tax lots on Brookwood Parkway/Helvetia Road within one-quarter mile south and north of the interchange was conducted as part of the existing conditions report, and the results can be seen in **Appendix A**. A map showing the tax lots and zoning is shown in **Figure 5**.

The analysis includes a summary of existing public and private approaches, type of use, tax lot, address, estimated approach width and location, zoning, and ownership.

### ***Right-of-Way***

BPA north-to-south transmission lines run through the northwest quadrant of the Study Area, then cross US 26 west of Gordon Faber Park, and run parallel and adjacent to US 26 to connect with the Keeler Substation just west of Cornelius Pass Road. East-to-west lines providing power to Tillamook and other Oregon coast communities run parallel to the north of Huffman Street in the Study Area.

### ***Canals and Culverts***

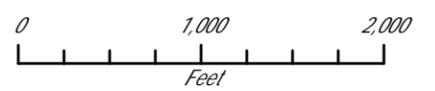
An existing culvert that carries Waibel Creek under Brookwood Parkway includes two 99-inch-diameter pipes. The North Hillsboro Industrial Strategy (March 2011) identifies these culverts as raising the flood level on the east side of Brookwood Parkway.

**US 26/Brookwood Parkway/  
Helvetia Road IAMP**

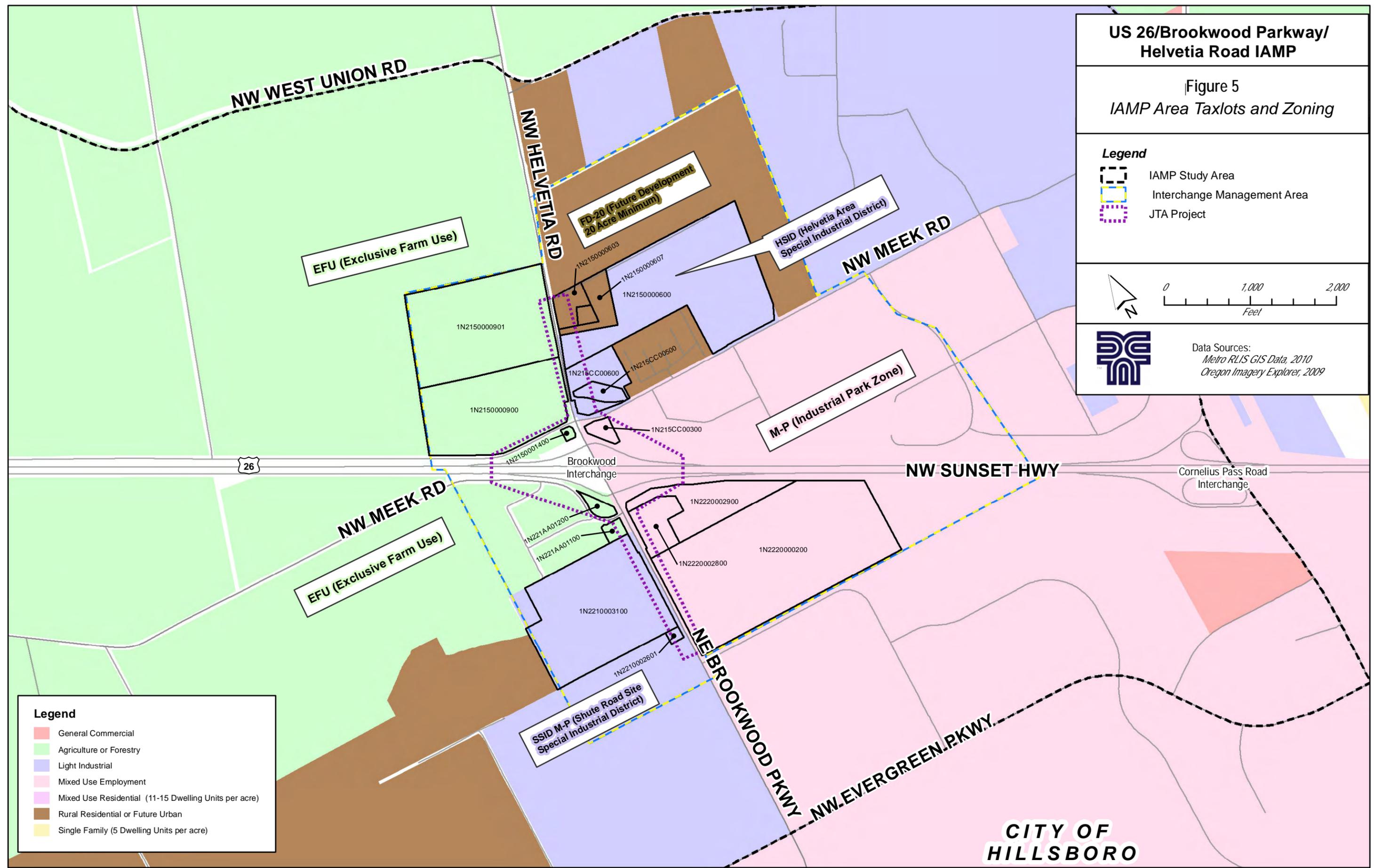
Figure 5  
IAMP Area Taxlots and Zoning

**Legend**

-  IAMP Study Area
-  Interchange Management Area
-  JTA Project



Data Sources:  
Metro RLIS GIS Data, 2010  
Oregon Imagery Explorer, 2009



- Legend**
-  General Commercial
  -  Agriculture or Forestry
  -  Light Industrial
  -  Mixed Use Employment
  -  Mixed Use Residential (11-15 Dwelling Units per acre)
  -  Rural Residential or Future Urban
  -  Single Family (5 Dwelling Units per acre)

**CITY OF  
HILLSBORO**

### 3. EXISTING TRANSPORTATION ANALYSIS

This section provides the description, methodology, and results of the existing conditions transportation analysis of the US 26/Brookwood Parkway/Helvetia Road Interchange Area Management Plan (IAMP). The existing conditions transportation analysis provides a physical feature summary, a safety summary, traffic volumes, and traffic operations.

#### Physical Features Summary

The following are descriptions of the major roadways in the IAMP study area. The types of information summarized for each major roadway include functional classification, number of lanes and the presence or absence of sidewalks, bicycle lanes and school zones.

**Appendix B** provides additional information about some of the roadways in the study area in a tabular format; including City of Hillsboro and Washington County functional classification, posted speed, width of the paved surface, and whether or not sidewalks, bicycle lane, and on-street parking are present. **Figure 6** shows the City of Hillsboro and Washington County functional classifications of the roadway network.

#### **US 26**

In the Study Area US 26 has two lanes in each direction, with interchanges at Cornelius Pass Road, Brookwood Parkway/Helvetia Road and Jackson School Road. The Cornelius Pass Road interchange has directional (northbound and southbound) off-ramps for westbound US 26 traffic and northbound and southbound on-ramps for traffic going eastbound on US 26. The eastbound on-ramps are metered during peak hours.

The Brookwood Parkway/Helvetia Road interchange is a standard diamond interchange with an approximately 2,000-foot deceleration lane for the westbound off-ramp. The eastbound on-ramp is metered during peak hours.

The Jackson School Road interchange is also a standard diamond interchange, although its design is newer than the Brookwood Parkway/Helvetia Road interchange. Unlike the other two interchanges in the Study Area, the Jackson School Road interchange ramp terminals are not signalized, and there is no urban development near the interchange. The eastbound on-ramp is metered during peak hours.

#### **Brookwood Parkway**

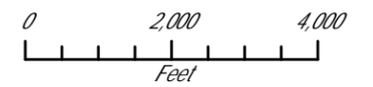
Brookwood Parkway is a five-lane roadway that runs north-south through Hillsboro, from US 26 south past Hillsboro Airport, and ends at West Baseline Road. The road is classified as an arterial. Brookwood Parkway has a treed median south of the interchange for most of its length. Sidewalks are present south of the intersection of Huffman Street, but there are no bicycle lanes at any point along its length.

**US 26/Brookwood Parkway/  
Helvetia Road IAMP**

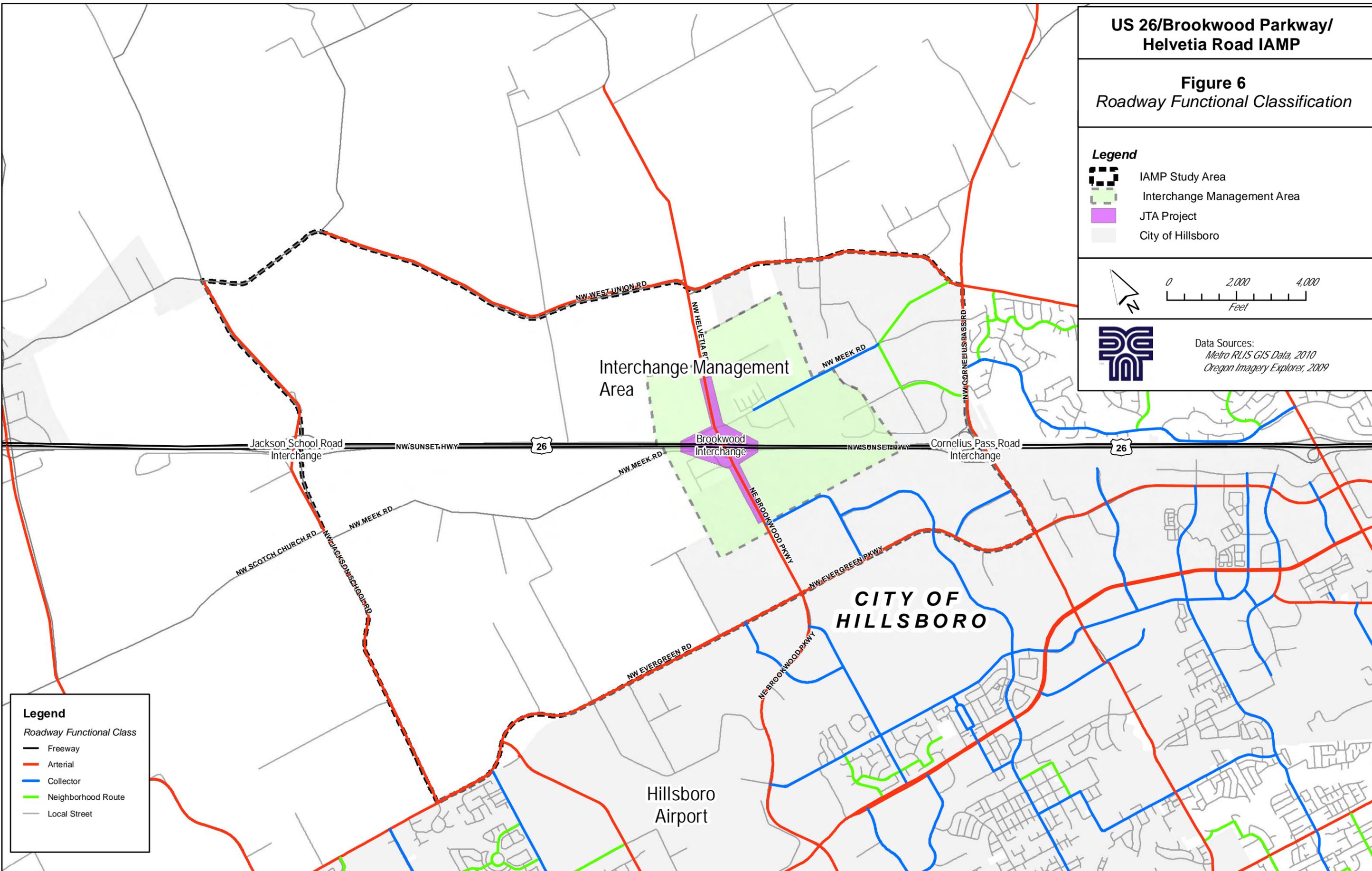
**Figure 6**  
*Roadway Functional Classification*

**Legend**

-  IAMP Study Area
-  Interchange Management Area
-  JTA Project
-  City of Hillsboro



Data Sources:  
Metro RLIS GIS Data, 2010  
Oregon Imagery Explorer, 2009



**Legend**

*Roadway Functional Class*

-  Freeway
-  Arterial
-  Collector
-  Neighborhood Route
-  Local Street

**Helvetia Road**

Helvetia Road is a rural north-south roadway that begins at the interchange with US 26 and continues north past the limits of the Study Area. At Meier Road, the roadway turns left and continues westbound to the intersection of Jackson Quarry Road. Helvetia Road is classified through the city of Hillsboro and Washington County as an arterial roadway. For the majority of its length, Helvetia Road is two lanes without shoulders or sidewalks. Near the US 26 interchange, the road widens into a four-lane cross-section.

**Cornelius Pass Road**

Cornelius Pass Road is a five-lane arterial roadway with a two-way center left-turn lane. The roadway carries large traffic volumes to and from US 26. North of the interchange, Cornelius Pass Road provides access to businesses on the west side of the road and to residential areas on east side. South of US 26, Cornelius Pass Road provides access to businesses on both sides. The roadway has both sidewalks and bicycle lanes on both sides. The north end of Cornelius Pass Road is within in a school zone, but there is no 20 MPH posted school speed limit.

**Jackson School Road**

Jackson School Road is in unincorporated Washington County, outside the City of Hillsboro. Jackson School Road is a rural roadway that runs north-south from Shadybrook Road to NE Grant Street. The roadway generally has two lanes, but there are stretches where a left-turn lane is present. Jackson School Road is classified as an arterial by Washington County.

**Sewell Road**

Sewell Road is classified as a local street and lies outside the City of Hillsboro. Sewell Road is a two-lane road that provides access to the residential areas between Evergreen Road and Meek Road. There are no sidewalks or bicycle lanes on Sewell Road.

**Evergreen Parkway/Road**

Evergreen Parkway is a major east-west roadway that runs from Glencoe Road to Cornell Road. Evergreen Parkway has two lanes of traffic in each direction. A fifth lane in the center is composed of, in various parts of the corridor, a treed median, opposing left-turn lanes, and a two-way center left-turn lane. Evergreen Parkway is classified as an arterial roadway.

**Meek Road**

Meek Road runs east-west immediately south of and parallel to US 26 from Brookwood Parkway to Jackson School Road. Meek Road is two-way roadway with an approximate paved width between 22 and 24 feet. Meek Road is classified as a collector and has no sidewalks or bicycle lanes.

**Jacobson Road**

Jacobson Road is a three-lane collector roadway with a two-way center left-turn lane. It runs east-west from Cornelius Pass Road to Helvetia Road. Jacobson Road has sidewalks and bicycle

lanes on both sides east of Croeni Road. West of Croeni Road, there are intermittent sidewalks and bicycle lanes, generally on the south side.

### ***West Union Road***

West Union Road is an east-west two-lane road and is classified as an arterial roadway by Washington County. The roadway widens on the approach to Cornelius Pass Road, and sidewalks and an eastbound bicycle lane are present near that intersection. West Union Road is within a school zone that requires a 20 mph speed during school hours.

### ***Century Boulevard***

Classified as a collector roadway, Century Boulevard has three-lanes with a two-way center left-turn lane. Century Boulevard runs north-south from West Union Road to Five Oaks Drive with a gap in the road north of Jacobson Road. Century Boulevard has sidewalks and bicycle lanes.

### ***Croeni Road***

Croeni Road is a three-lane local roadway as classified by the City of Hillsboro. Croeni Road runs from Century Boulevard, across Jacobson Road and continues to Five Oaks Drive. There are sidewalks, but bicycle lanes are not present. Croeni Road south of Jacobson Road until Wagon Way is within a school zone that requires a 20 mph speed during school hours.

### ***Groveland Drive***

Groveland Drive is a two-lane local roadway. Groveland Drive runs parallel to US 26 from the Rice Northwest Museum of Rocks & Minerals to Helvetia Road. There are no sidewalks or bicycle lanes present.

### ***Groveland Road***

Groveland Road is a two-lane local roadway. Groveland Road runs north-south from north of West Union Road to Groveland Drive. There are no sidewalks or bicycle lanes present, and the majority of the section south of West Union Road is unpaved.

### ***Pubols Road***

Pubols Road is a two-lane local roadway as classified by Washington County. Pubols Road extends east from Helvetia Road and serves as a residential access. There are no sidewalks or bicycle lanes present.

### ***Schaaf Road***

Schaaf Road is a two-lane local roadway as classified by Washington County. Signage in place indicates Schaaf Road as a private drive, and there are no sidewalks or bicycle lanes present. Schaaf Road extends east from Helvetia Road and serves as residential access.

**253<sup>rd</sup> Avenue**

The north leg of 253<sup>rd</sup> Avenue is a two-lane local roadway as classified by Washington County. 253<sup>rd</sup> Avenue is unpaved and extends north of Evergreen Parkway, serving as a residential access. There are no sidewalks or bicycle lanes present. The south leg of 253<sup>rd</sup> Avenue is a driveway access to a private commercial business.

**Eggiman Road/273<sup>rd</sup> Avenue**

Eggiman Road/273<sup>rd</sup> Avenue is a two-lane local roadway as classified by Washington County. There are no sidewalks or bicycle lanes present. Eggiman Road/273<sup>rd</sup> Avenue extends north from Evergreen Parkway and serves as residential access.

**Huffman Street**

Classified as collector by Washington County, Huffman Street is a three-lane road with a two-way center left-turn lane. Huffman Street extends east from Brookwood Parkway until it becomes 235<sup>th</sup> Avenue. Huffman Street has both sidewalks and bicycle lanes.

**235<sup>th</sup> Avenue**

Classified as collector by Washington County, 235<sup>th</sup> Avenue varies between a two-lane road and a three-lane road. 235<sup>th</sup> Avenue travels north-south from just south of Evergreen Parkway to Huffman Street. North of Evergreen Parkway, 235<sup>th</sup> Avenue has both sidewalks and bicycle lanes, with only intermittent sidewalks present south of Evergreen Parkway.

**Bennett Street**

Classified as collector by Washington County, Bennett Street is a three-lane road with a two-way center left-turn lane. Bennett Street extends east from 235<sup>th</sup> Avenue until it becomes 229<sup>th</sup> Avenue. Bennett Street has both sidewalks and bicycle lanes.

**229<sup>th</sup> Avenue**

Classified as collector by Washington County, 229<sup>th</sup> Avenue is a three-lane road with a two-way center left-turn lane. 229<sup>th</sup> Avenue runs north-south from Cornell Road to Bennett Street. Within the Study Area, 229<sup>th</sup> Avenue has both sidewalks and bicycle lanes.

**Imbrie Drive**

Classified as collector by Washington County, Imbrie Drive is a three-lane road with a two-way center left-turn lane. Imbrie Drive runs east-west between Evergreen Parkway and Cornelius Pass Road. Imbrie Drive has sidewalks but no bicycle lanes.

**Wagon Way**

Wagon Way is an east-west road that extends west from Cornelius Pass Road. From Cornelius Pass Road to Croeni Road, Wagon Way is a three-lane road with a two-way center left-turn lane and is classified as a neighborhood route by Washington County. West of Croeni Road, Wagon Way is a two-lane local road. Sidewalks are consistently present on the north side of the road,

but are intermittently present on the south side. Wagon Way is within a school zone that requires a 20 mph speed during school hours.

### ***Five Oaks Drive***

Five Oaks Drive is a two-lane local road extending between Century Boulevard and Wagon Way. Sidewalks are present on the south side of the road between Croeni Road and Wagon Way, and there are no bicycle lanes.

## **Safety Summary**

Traffic and roadway design engineers are continually engaged in working to ensure that a system is designed and operated such that the frequency and severity of crashes can be reduced for all modes of travel. Improving roadway safety (reducing the frequency and/or severity of crashes) requires consideration of several elements that influence traffic operations; in addition to design aspects of a roadway, driver education, enforcement, and emergency medical services are also essential.

A crash analysis was conducted to determine whether any significant, documented safety issues exist within the Study Area and to identify specific measures or general strategies for improving overall safety. As part of the crash analysis, historical crash data was reviewed, intersection crash rates were calculated, and the state's Safety Priority Index System (SPIS) was examined.

### ***Crash History***

The crash analysis included a review of crash history data supplied by the ODOT Crash Analysis and Reporting Unit for the period between January 1, 2008, and December 31, 2010, which were the three most recent full years for which crash data were available at the time of the analysis. **Figure 7** illustrates the breakdown of the crash types within the Study Area, and **Figure 8** breaks down the study area crashes by severity.

Figure 7. Crash Type<sup>1</sup>

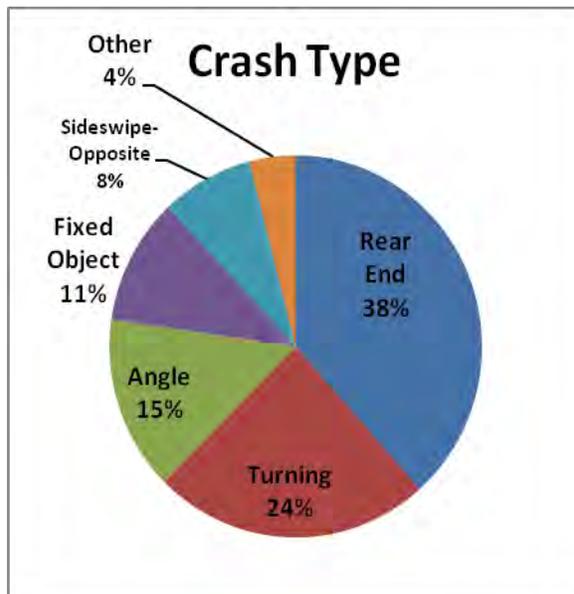
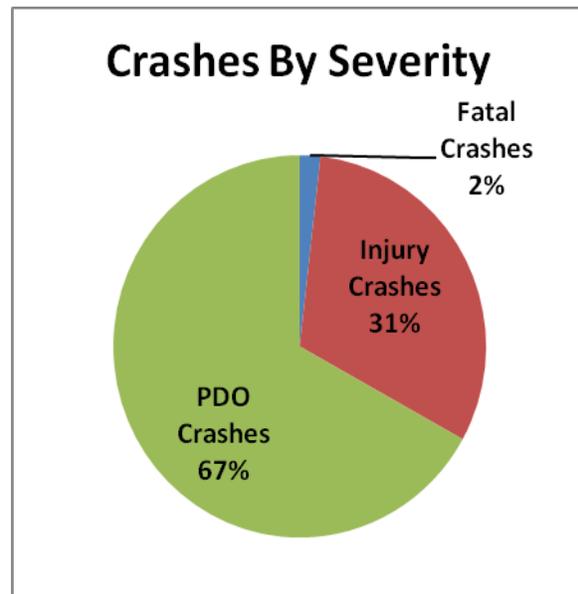


Figure 8. Crashes by Severity<sup>1</sup>



<sup>1</sup>These figures represent the combined total mainline and intersection crashes

For the study intersections, the ODOT database includes records for 182 crashes. The data highlights the Study Area as having high incidences of traffic crashes, and two reported serious injuries or fatalities. Approximately 30 percent (55 crashes) of all reported intersection crashes involved minor injuries, and 69 percent (125 crashes) were property-damage-only (PDO). The majority of crashes (63) were rear-end related crashes, which are frequently attributed to congestion and queuing. The next most frequent (53 crashes) type of crash was turning related. There were only two reported bicycle or pedestrian crashes within the Study Area. Although there are a high number of crashes, there are no obvious crash trends that would warrant mitigation, though modifications to the geometry at the unsignalized intersection of Jackson School Road at West Union Road have the potential to improve safety.

Crashes along US 26 are primarily rear-end, fixed-object, and sideswipe related. For the segment of US 26 surrounding the interchange, the ODOT database includes records for 42 crashes. The data highlight the corridor as having a low incidence of traffic crashes (with a crash rate significantly lower than the statewide average). One fatality and one serious injury were reported (5 percent of the freeway crashes). Approximately 36 percent of all reported crashes involved minor injuries, and the remaining 59 percent were property-damage-only (PDO). The majority of crashes (23) were rear-end related. There are no obvious crash trends that would warrant mitigation.

**Crash Rates**

Crash rates were calculated for the Study Area intersections and for the segment of US 26 surrounding the interchange. At intersections, the crash rate is calculated as the number of crashes per million vehicles entering the intersection. Intersections with a crash rate greater than 1.0 crashes per million entering vehicles (crashes/mev) generally warrant closer investigation but are not necessarily indicative of safety concerns.

Of the Study Area intersections, only one intersection warrants further investigation. The intersection of Jackson School Road at West Union Road has a crash rate above 2.0 crashes/mev, with an average of at least five crashes per year for the last three years. Almost all of the crashes were angle crashes, with the remaining being attributed to turning. For the US 26 segment within the Study Area (MP 59.00-MP 62.00), the crash rate is calculated as the number of crashes per million vehicle miles traveled (crashes/mvm). Along the US 26 segment surrounding the Study Area, the three-year average crash rate is 0.15 crashes/mev. This is approximately one-fourth of the most recent three-year (2007-2009) statewide average for similar facilities within the urban highway system of approximately 0.67 crashes/mev.<sup>1</sup>

Looking at each major roadway within the Study Area roads, two of the roads show crash rates above 1.0 crashes/mvm, including Cornelius Pass Road and Jackson School Road. In the case of Jackson School Road, the crash rate for the segment is likely high because of the high crash rate at the intersection with West Union Road. Similarly, Cornelius Pass Road has several reported crashes surrounding the connections at the US 26 interchange, most of which were rear-end crashes. Rear-end collisions commonly occur at signalized intersections because so many vehicles are required to stop with signalized traffic control.

The crash data is summarized in **Table 1**, with the detailed reports contained in **Appendix C**.

**Table 1. Summary of Collision Types within the Study Area (January 1, 2008 through December 31, 2010)**

Study Location	Collision Type										Total	Severity			3-Year Crash Rate (crashes/mev)
	Rear End	Fixed Object	Angle	Other	Backing	Turning	Sideswipe- Opposite	Sideswipe- Meeting	Non-Collision	Pedestrian		Fatal & Serious Injury Crashes	Injury Crashes	PDO Crashes	
Cornelius Pass Road - From West Union Road to Evergreen Parkway	27	2	5	0	0	14	8	0	0	1	57	0	17	40	1.22
Evergreen Parkway - From Cornelius Pass Rd to Jackson School Rd.	6	4	5	0	0	12	1	1	0	1	30	0	10	20	0.38
Brookwood Parkway / Helvetia Road - From West Union Road to Evergreen Parkway	19	3	6	0	0	7	1	2	1	0	39	2	9	28	0.71
Jackson School Road - From West Union Road to Evergreen Parkway	9	5	9	0	0	15	0	1	0	0	39	0	10	29	1.80
Jacobson Road - From Cornelius Pass Rd to Helvetia Road	2	0	3	0	0	1	0	0	0	0	6	0	2	4	0.56
West Union Road - From Jackson School Road to Evergreen Parkway	0	1	5	0	1	4	0	0	0	0	11	0	7	4	0.44
<b>Total Roadway Crashes</b>	<b>63</b>	<b>15</b>	<b>33</b>	<b>0</b>	<b>1</b>	<b>53</b>	<b>10</b>	<b>4</b>	<b>1</b>	<b>2</b>	<b>182</b>	<b>2</b>	<b>55</b>	<b>125</b>	

<sup>1</sup> 2009 Oregon State Highway Crash Rate Tables, Table 4, ODOT, August 2010.

Study Location	Collision Type										Total	Severity			3-Year Crash Rate (crashes/mev)
	Rear End	Fixed Object	Angle	Other	Backing	Turning	Sideswipe- Opposite	Sideswipe- Meeting	Non-Collision	Pedestrian		Fatal & Serious Injury Crashes	Injury Crashes	PDO Crashes	
US 26	23	9	0	1	0	1	8	0	0	0	42	2	15	25	0.15
Total Study Area Crashes	86	24	33	1	1	54	18	4	1	2	224	4	70	150	

**Safety Priority Index System (SPIS)**

The SPIS is a method used in Oregon to identify safety problem areas along state highways. Highways are evaluated in approximately one-tenth-mile increments (often grouped into larger segments). Each year these segments are ranked by assigning a SPIS score based on the frequency and severity crashes observed, while taking traffic volume into account. When a segment is ranked in the top 10 percent of the index, a crash analysis is typically warranted, and corrective actions are considered. Along US 26 within the Study Area, there are no segments identified in the top 10 percent of the most recent (2010) SPIS rankings.

**Traffic Volumes**

This section summarizes the traffic data collection, and identifies any traffic count data inconsistencies and resolutions. It includes analysis of traffic count information, historical adjustments of traffic counts to the existing year, application of adjustment factors to account for seasonal variation, and developed volumes for the 30<sup>th</sup> highest hour and the Average Daily Traffic (ADT) volume. Traffic count information includes vehicle classification shown as truck percentages for locations that used manual classification counts.

**Traffic Data Collection**

Traffic volume data collected for this project primarily consisted of new intersection turn movement counts, though there was a number of historical turn movement counts used. There were 39 intersections where data were collected. **Appendix D (Sec. D-1)** lists all the intersection turn movement count locations and their individual AM and PM peak hours, along with the year they were counted. **Figure 9** is a map of the 39 turn movement and five 24-hour classification count locations. The traffic volume data were examined to determine the weekday common (average) AM and PM peak hours among the intersections. The common peak hour for the intersections was 7:30 to 8:30 in the AM and 4:45 to 5:45 in the PM. The peak hour at each intersection may or may not correspond to the common peak hour, but all individual peak hours generally overlap within at least a portion of the common peak hour.



**Seasonal Volume Adjustment**

As specified in ODOT’s Analysis Procedures Manual (APM)<sup>2</sup> and briefly described here, the traffic counts, which were collected at varying times of the year, must be adjusted using a seasonal factor to reflect volume during the peak month of the year. The seasonal factor is determined from automatic traffic recorders (ATRs), which are electronic counting sites on roadways that count vehicles continuously. It is desirable to obtain data from ATRs that (1) are within the IAMP study area, (2) are on similar roadway types or within similar area types, or (3) have similar seasonal trend characteristics. The seasonal adjustment factors for the IAMP study area are based on two similar ATRs located within similar area types elsewhere in Oregon. The seasonal factors used for the IAMP project are shown in **Table 2**. The data used in calculating the seasonal factors are included in **Appendix D (Sec. D-2)**.

**Table 2. Seasonal Adjustment Factors for US 26/Brookwood Parkway/Helvetia Road IAMP Project**

Month	Seasonal Factor
March	1.11
May	1.05
July (peak month)	1.00
October	1.07

**Annual Volume Adjustment**

The counts used for this analysis are also from varying years and must be adjusted to a common year for analysis. Typically traffic counts from past years would be adjusted to the most current year. However, after consultation with ODOT staff about the current state of the economy, which has caused volumes to decrease in recent years, it was determined that counts should be adjusted to the year with the highest ADT. Comparisons of ADT volumes on Cornelius Pass Road show that peak volumes occurred in 2007. Although existing conditions are being evaluated for year 2011, all traffic volumes are adjusted to the peak year of 2007. The annual adjustment factors used are shown in **Table 3**. The data used in calculating the annual factors are included in **Appendix D (Sec. D-2)**.

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<sup>2</sup> Analysis Procedures Manual, Oregon Department of Transportation, Transportation Development Division Planning Section, Transportation Planning and Analysis Unit, Salem, Oregon, April 2006, Section 4.3.

**Table 3. Annual Adjustment Factors for US 26/Brookwood Parkway/Helvetia Road IAMP Project**

Year	Annual Factor
2007	1.00
2010	0.98
2011 (year of analysis)	1.00

**Peak Hour Volumes**

After annual and seasonal adjustments were made, the volumes were balanced to achieve a uniform dataset for analysis. The final AM and PM peak hour volumes for all study intersections are shown for the US 26/Brookwood Parkway/Helvetia Road IAMP in **Figure 10** through **Figure 12**. Peak hour volumes were calculated for a total of 39 intersections in the PM peak hour. AM peak hour volumes are shown for only 15 locations. The AM peak hour locations are locations where the total entering AM peak hour volume is higher than the PM peak hour or AM peak hour operations are anticipated to be more congested than the PM peak hour. The calculations used to balance the AM and PM peak hour volumes can be seen in **Appendix D (Sec. D-3)**.

**ADT Volumes**

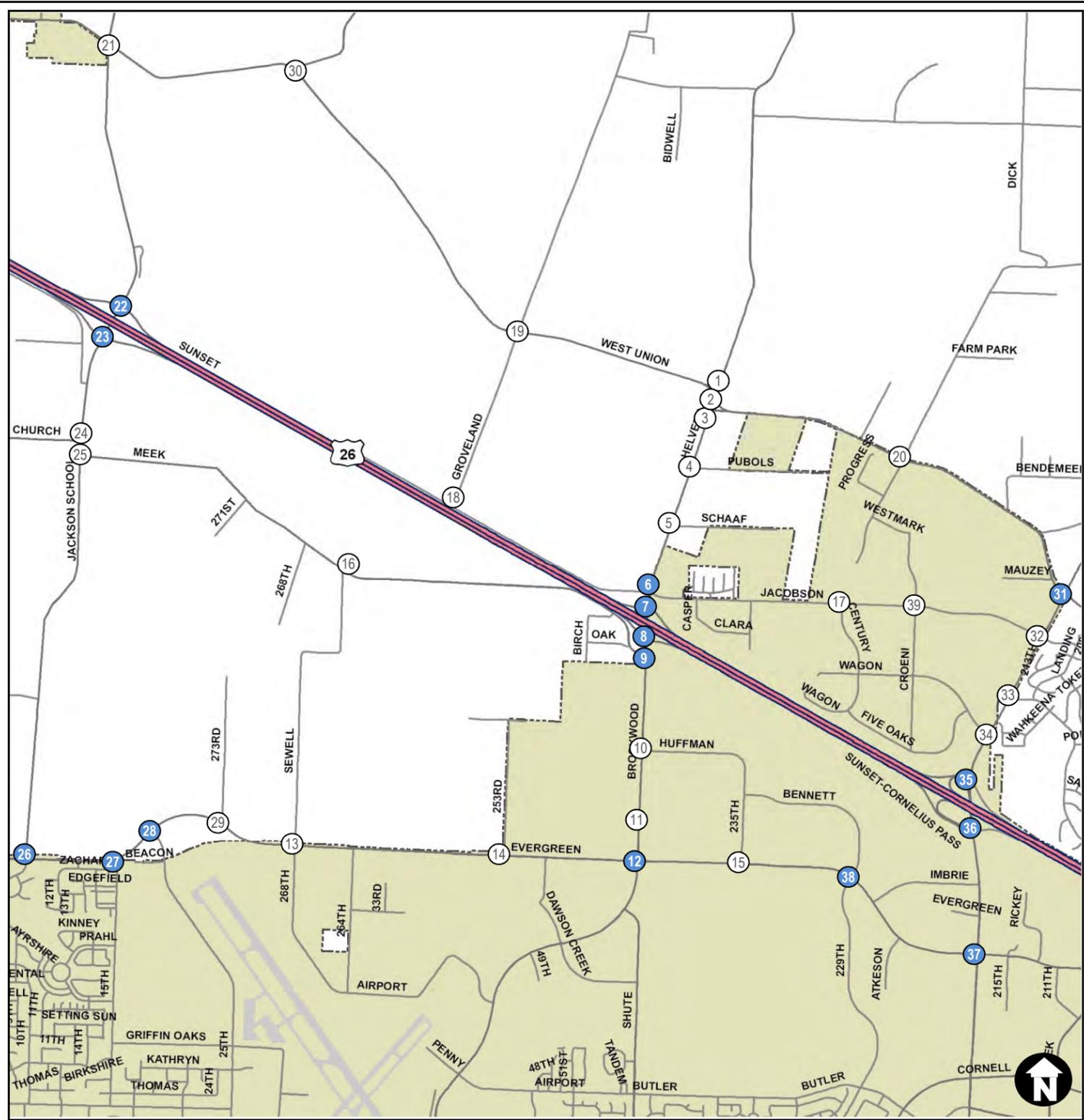
Average daily traffic (ADT) volumes were calculated at several points in the Study Area. The volumes were developed using the following methodology.

First, Study Area K-factors were created. The K-factor is defined as the percent of the 24-hour volume that occurs during the daily peak hour. Twenty-four-hour tube counts collected during 2010 and 2011 at 22 locations in the Study Area were used to determine the Study Area K-factors. For the Study Area, the K-factors were determined using the PM peak hour volumes, because they were the highest hourly volumes during the day. For areas outside of the Brookwood interchange management area, the K-factor was determined to be 0.095; the K-factor for areas within the interchange management area was calculated to be 0.10; and the K-factors for the US 26 mainline were calculated to be 0.08 east of Brookwood Parkway, and 0.096 west of Brookwood Parkway. ADT volumes were determined for 36 locations in the Study Area by taking the PM peak hourly volume and dividing it by the K-factor. The calculations used can be seen in **Appendix D (Sec. D-4)**. The ADT volumes are shown in **Figure 13**.

**Traffic Operations**

**Operational Criteria**

Transportation engineers have established various methods for measuring traffic operations of roadways and intersections. Most jurisdictions use either volume-to-capacity (v/c) ratio or level of service (LOS) to establish performance criteria. Both the LOS and v/c ratio concepts require consideration of factors that include traffic demand, capacity of the intersection or roadway, delay, frequency of interruptions in traffic flow, relative freedom for traffic maneuvers, driving comfort, convenience, and operating cost.



<b>Helvetia Rd @ Jacobson Rd</b> <b>6</b>  TEV = 858	<b>Brookwood Pkwy @ US26 WB Ramps</b> <b>7</b>  TEV = 2152	<b>Brookwood Pkwy @ US26 EB Ramps</b> <b>8</b>  TEV = 2727	<b>Brookwood Pkwy @ Meek Rd</b> <b>9</b>  TEV = 2669	<b>Brookwood Pkwy @ Evergreen Pkwy</b> <b>12</b>  TEV = 3715
<b>Jackson Sch Rd @ US26 WB Ramps</b> <b>22</b>  TEV = 584	<b>Jackson Sch Rd @ US26 EB Ramps</b> <b>23</b>  TEV = 1197	<b>Jackson Sch Rd @ Evergreen Pkwy</b> <b>26</b>  TEV = 1751	<b>15th Avenue @ Evergreen Pkwy</b> <b>27</b>  TEV = 1640	<b>25th Avenue @ Evergreen Pkwy</b> <b>28</b>  TEV = 2040
<b>Cornelius Pass Rd @ West Union Rd</b> <b>31</b>  TEV = 2040	<b>Cornelius Pass Rd @ US26 WB Ramps</b> <b>35</b>  TEV = 3090	<b>Cornelius Pass Rd @ US26 EB Ramps</b> <b>36</b>  TEV = 3522	<b>Cornelius Pass Rd @ Evergreen Pkwy</b> <b>37</b>  TEV = 3260	<b>229th Avenue @ Evergreen Pkwy</b> <b>38</b>  TEV = 2265



**Legend**

123 Peak Hour Volume

→ Turning Movement

TEV: Total Entering Volume

Intersection evaluated

Intersection not evaluated in AM Peak Hour

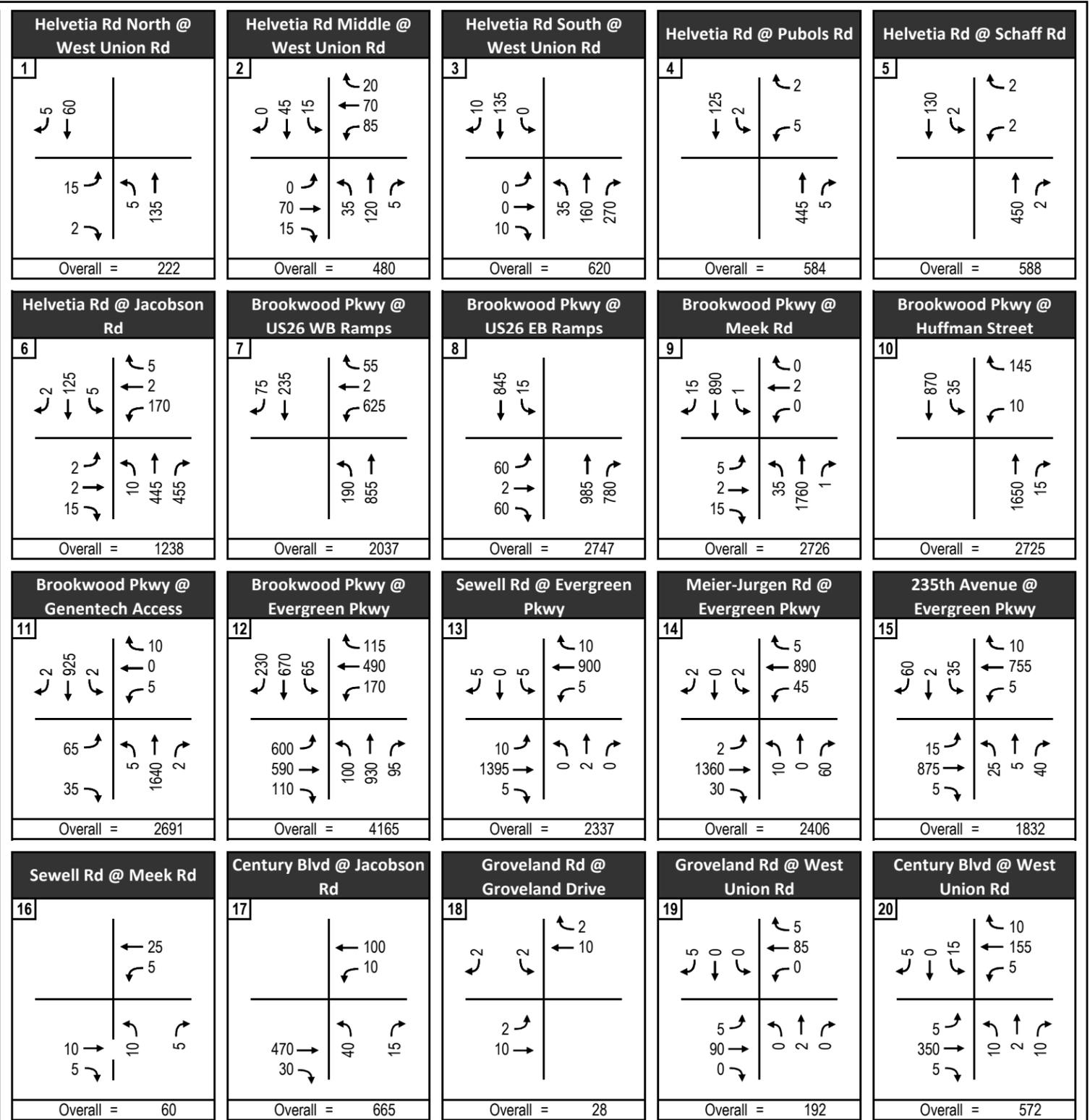
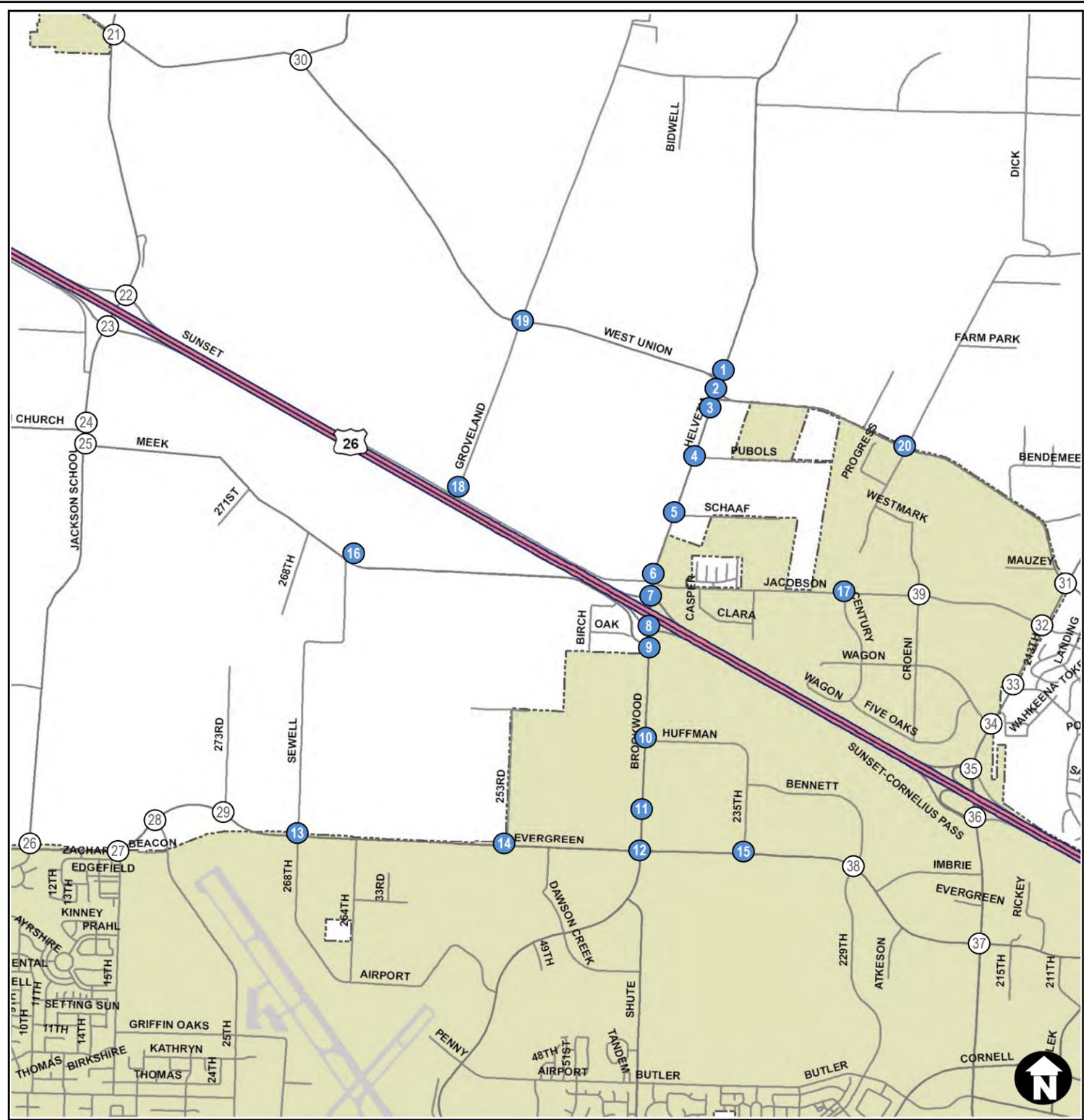
**FIGURE 10**

**2011 Existing Conditions**

**Turning Movement Traffic Volumes**

**AM Peak Hour**

**US 26 / Brookwood / Helvetia IAMP**



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**Oregon Department of Transportation**

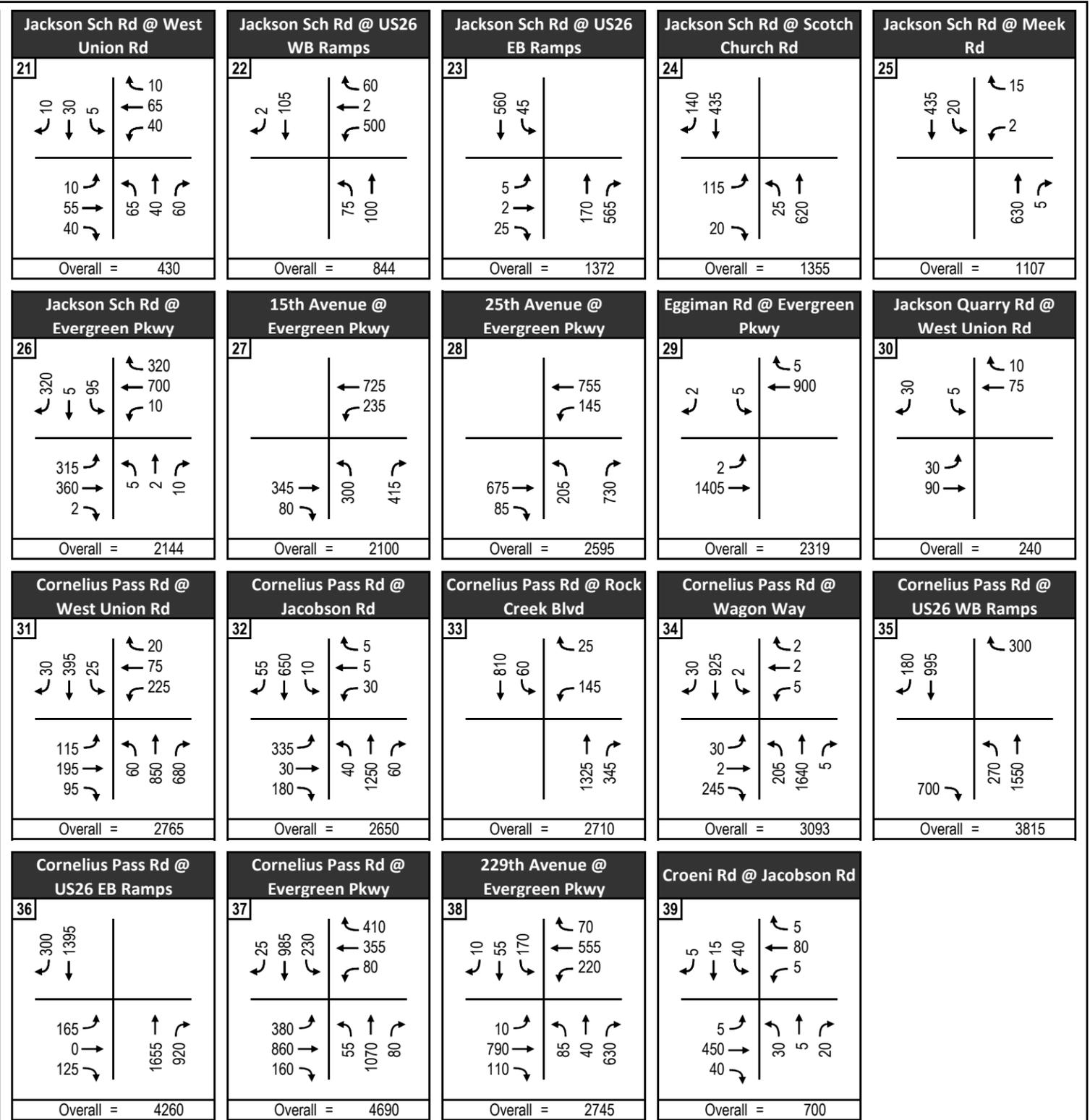
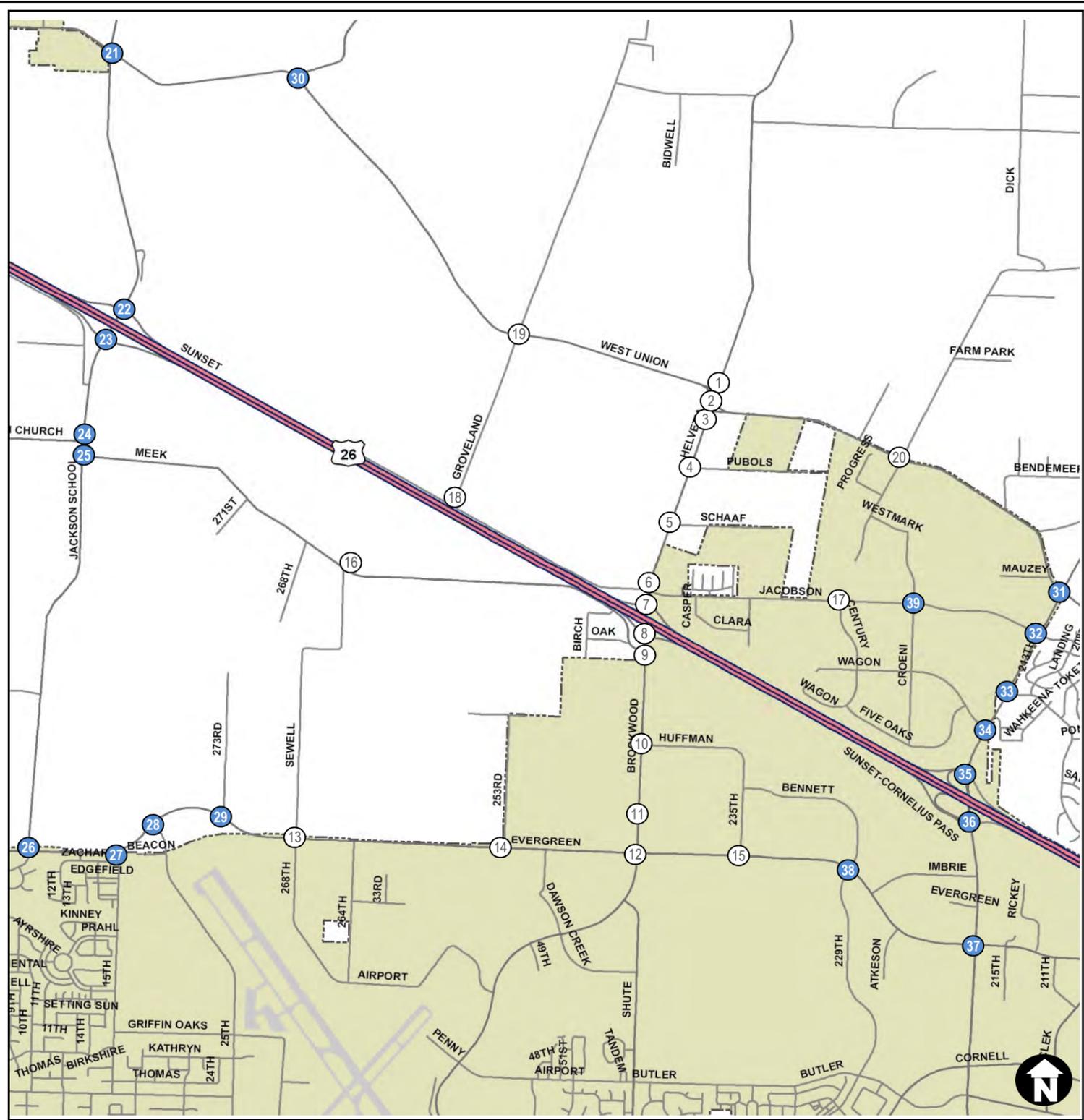
**Legend**

- 123 Peak Hour Volume
- Turning Movement
- TEV: Total Entering Volume
- # Intersection volumes shown
- # Intersection volumes shown on separate figure

**FIGURE 11**

**2011 Existing Conditions**  
**Turning Movement Traffic Volumes**  
**PM Peak Hour**

**US 26 / Brookwood / Helvetia IAMP**



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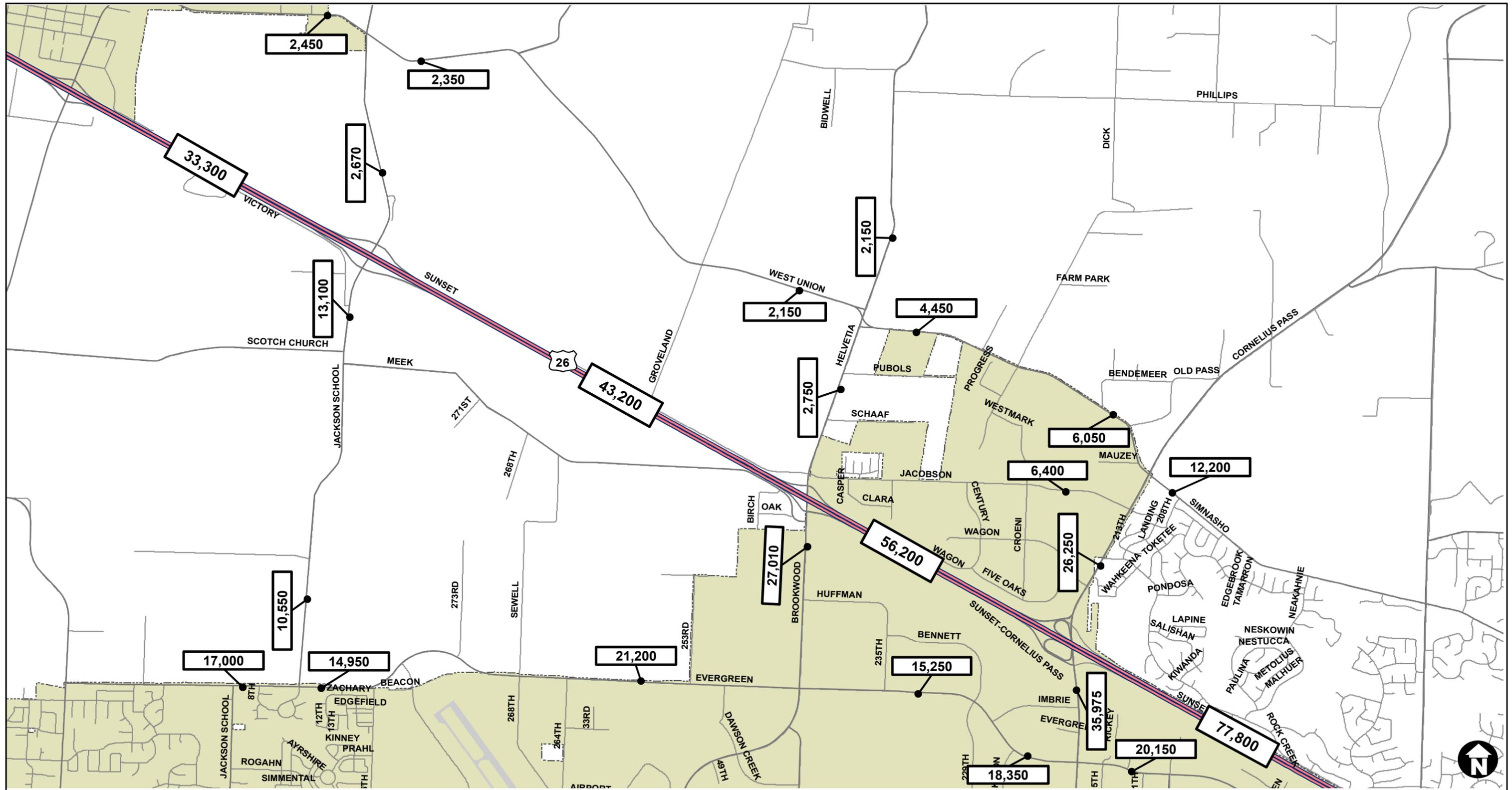
**Legend**

- 123 Peak Hour Volume
- Turning Movement
- TEV: Total Entering Volume
- # Intersection volumes shown
- # Intersection volumes shown on separate figure

**FIGURE 12**

**2011 Existing Conditions**  
**Turning Movement Traffic Volumes**  
**PM Peak Hour**

**US 26 / Brookwood / Helvetia IAMP**



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**Legend**

15,000 2011 Average Daily Traffic (ADT)

**FIGURE 13**

2011 Existing Conditions  
Average Daily Traffic

US 26 / Brookwood / Helvetia IAMP

### **Volume-to-Capacity (V/C) Ratio**

A comparison of traffic volume demand to intersection capacity is one method of evaluating how well an intersection is operating. This comparison is presented as a v/c ratio. A v/c ratio of less than 1.00 indicates that the volume is less than capacity. When the v/c ratio is closer to zero, traffic conditions are generally good, with little congestion and low delays for most intersection movements. As the v/c ratio approaches 1.00, traffic becomes more congested and unstable, with longer delays.

### **Level of Service (LOS)**

LOS is also a widely recognized and accepted measure and descriptor of traffic operations. At both STOP-controlled and signalized intersections, LOS is a function of control delay, which includes initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay. Six standards have been established, ranging from LOS A, where there is little or no delay, to LOS F, where there is delay of more than 50 seconds at unsignalized intersections, or more than 80 seconds at signalized intersections.

It should be noted that, although delays can sometimes be long for some movements at a STOP-controlled intersection, the v/c ratio may indicate that there is adequate capacity to process the demand for that movement. Similarly, at signalized intersections, some movements, particularly side street approaches or left turns onto side streets, may experience longer delays because they receive only a small portion of the green time during a signal cycle, but their v/c ratio may be relatively low. For these reasons, it is important to examine both v/c ratio and LOS when evaluating overall intersection operations. Both are reported in the following section.

### **Operational Standards**

The OHP has established several policies that enforce general objectives and approaches for maintaining highway mobility. Of these policies, the Highway Mobility Standards (Policy 1F) establish maximum v/c ratio standards for peak hour operating conditions for all highways in Oregon based on the location and classification of the highway segment being examined. The OHP policy also specifies that the v/c ratio standards be maintained for ODOT facilities through a 20-year horizon.

Hillsboro, Washington County, and Metro also have their own performance standards. Hillsboro uses LOS as a performance standard, while Washington County and Metro use v/c ratio standards. For the existing conditions, **Table 4** below provides a summary of applicable operational standards for each jurisdiction. These standards are outlined in their corresponding Transportation System Plans and master plans. Generally, where approaches are maintained by different jurisdictions, the more restrictive of the performance standards is applied.

**Table 4. Summary of Operational Standards for Existing Conditions**

Jurisdiction	Operational Standard
ODOT	
<i>Outside Metro UGB and not within another UGB<sup>1</sup></i>	0.70 v/c
<i>US 26, west of Sylvan, inside Metro UGB<sup>2</sup></i>	0.99 v/c (1 <sup>st</sup> hour)
<i>US 26 Ramp Terminals, inside Metro UGB</i>	0.85
<i>US 26 Ramp Terminals, outside Metro UGB</i>	0.70
City of Hillsboro <sup>3</sup>	LOS D
Washington County <sup>4</sup>	
<i>Inside UGB</i>	0.99 v/c
<i>Outside UGB</i>	0.90 v/c
<i>Metro<sup>5</sup></i>	0.99 v/c

1. Existing requirements outlined in 2009 OHP Mobility Standard Guidelines Table 6 and based on v/c.
2. Existing requirements outlined in 2009 OHP Mobility Standard Guidelines Table 6 and based on v/c and Metro interim regional mobility policy standards as outlined in the 2035 RTP, Table 2.4.
3. City of Hillsboro operating standards outlined in the Hillsboro Comprehensive Plan, Section 13.D.
4. Washington County operating standards outlined in Washington County Comprehensive Plan.
5. Metro 2035 Regional Transportation Plan.

**Traffic Operations Analysis Procedures**

All operations were evaluated using the methodology outlined in the *2000 Highway Capacity Manual* (HCM) along with the procedures outlined in ODOT’s Analysis Procedures Manual (APM). The Synchro/SimTraffic analysis software was selected to perform the intersection analysis, since it can provide the v/c ratio and LOS output of an HCM analysis as well as consider the systematic interaction of the intersections with regard to queuing and delays.

Synchro is a macroscopic model similar to the Highway Capacity Software (HCS), and like the HCS, is based on the 2000 HCM. The Synchro model explicitly evaluates traffic operations under coordinated and uncoordinated systems of signalized and unsignalized intersections. The v/c ratios and LOS presented in this report are based on the Synchro model output.

SimTraffic animates traffic flow based on input volumes and signal timing and allows viewing of traffic flow under saturated traffic conditions, where traffic may spill over from one intersection to another. It is particularly effective at evaluating closely spaced intersections. For locations where HCM is not applicable, the SimTraffic model was run multiple times using different arrival patterns to determine how sensitive traffic operations are in response to subtle variations in traffic flows. If it is determined that SimTraffic is needed, the 95<sup>th</sup> percentile queues from the SimTraffic model are also evaluated.

As noted above, the results from both Synchro and SimTraffic may be considered in this report. Because these programs evaluate operations using different methodologies, the analysis results sometimes vary; however, the differences are generally minor unless saturated or congested conditions are present. Under saturated conditions, SimTraffic queuing and delays present results that reflect how congested intersections impact each other, while Synchro represents intersection performance in isolation and may reflect better performance results.

### Existing Intersection Operations

Traffic operations were evaluated at all 39 Study Area intersections during the PM peak hour and at the 15 key AM peak hour intersections. **Figures 14 through 16** present the v/c ratios and LOS performance by lane group for the Study Area intersections. These findings reflect the current signal timing plans implemented at all signalized intersections. **Table 5** below summarizes the intersections that exceed operational standards. Four of the seven intersections fail because the intersection is operating at capacity given the current demand volume during peak periods. The other three intersections do not meet standards because the overall delay is too high for the City standard or the demand volume is too close to the capacity of the intersection to meet operational standards. Detailed analysis worksheets are presented in **Appendix E-1**.

**Table 5. Intersections Where Operational Standards Are Not Met**

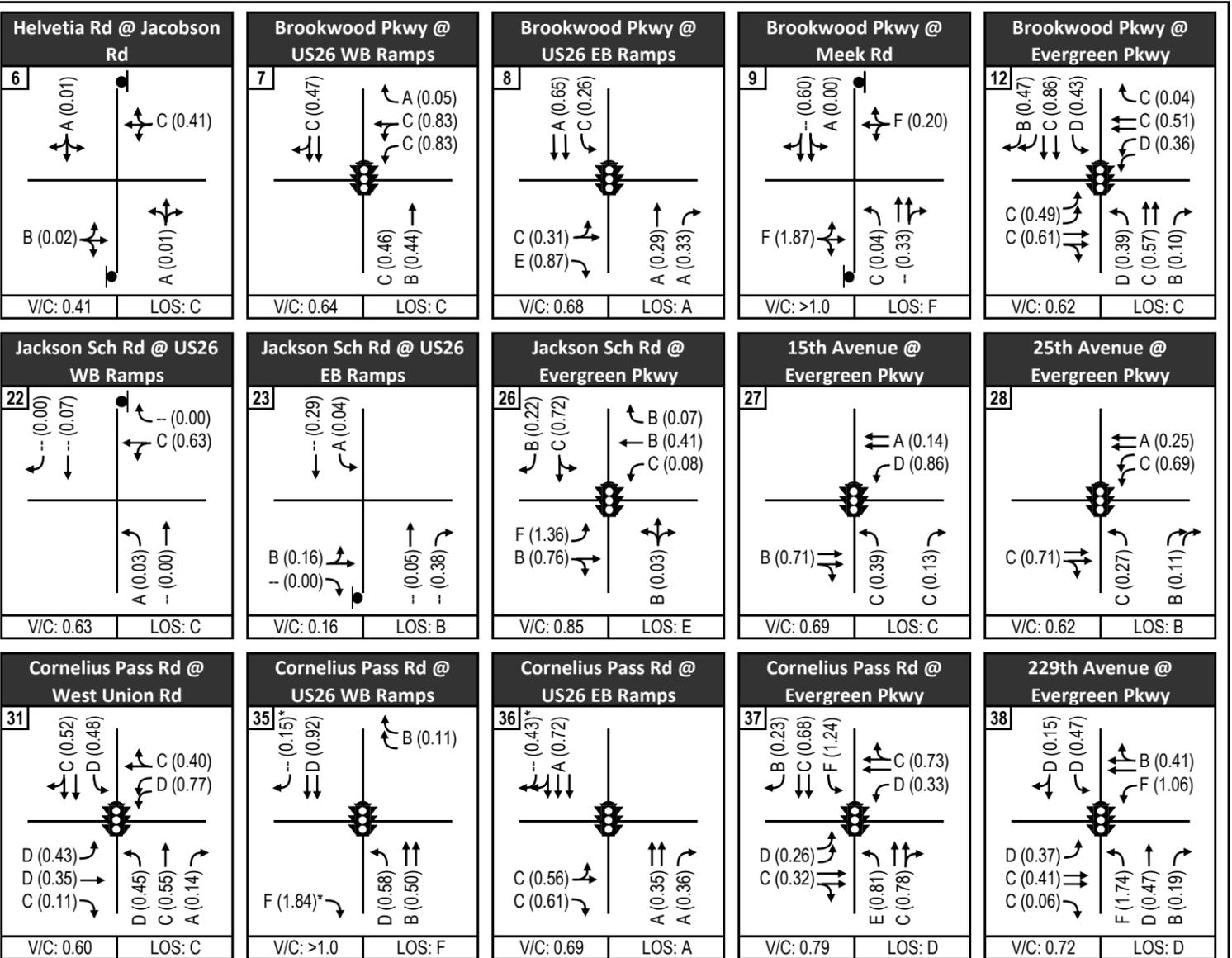
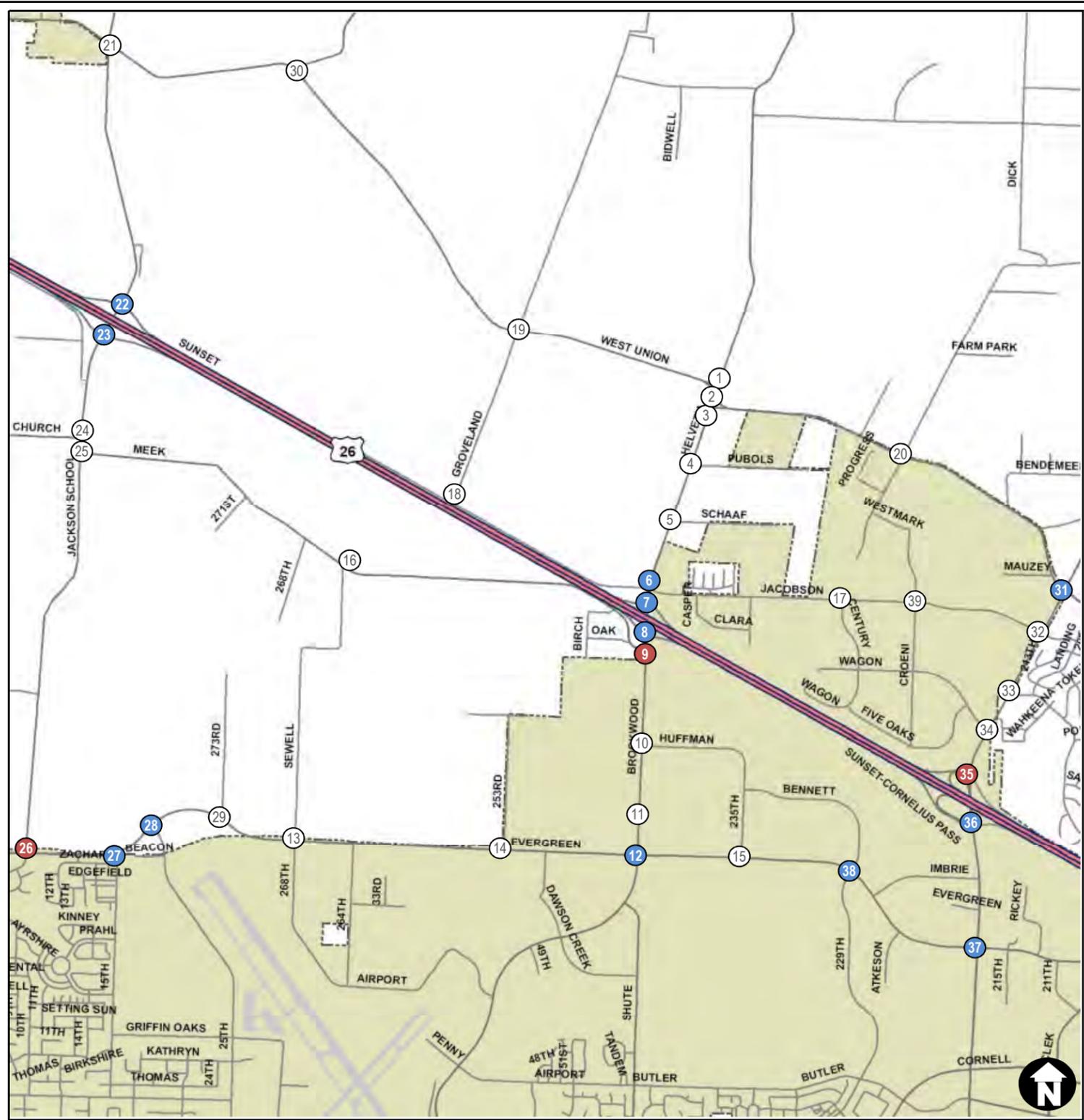
Location	AM		PM		Jurisdiction Where Operational
	v/c	LOS	v/c	LOS	
9. Brookwood Pkwy at Meek Rd	>1.0	F	0.33	F	All
11. Brookwood Pkwy at Genentech Access	Not analyzed in AM Peak Hour		>1.0	F	County & City
22. Jackson School Rd at US-26 Westbound Ramps	0.63	C	0.98	F	ODOT & County
24. Jackson School Rd at Scotch Church Rd	Not analyzed in AM Peak Hour		0.83	F	City
26. Jackson School Rd at Evergreen Pkwy	0.85	E	0.89	D	City
35. Cornelius Pass Rd at US-26 Westbound Ramps	>1.0	F	0.91	D	All
37. Cornelius Pass Rd at Evergreen Pkwy	0.79	D	>1.0	E	All

Notes:

1. **SHADED** cell indicates intersection that fails to meet operational standards.
2. "All" indicates the following jurisdictions: ODOT, City of Hillsboro, Washington County, and Metro.
3. For a signalized intersection, the overall operation of the intersection is reported. For an unsignalized intersection, the worst stopped (or yield) movement is reported.

### Existing Freeway Operations

HCS was used to determine freeway operations along US 26 between the Jackson School Road interchanges and the Cornelius Pass Road interchange. **Figure 17** summarizes the v/c ratios for US 26 in the Study Area mainline, merge, and diverge areas. As shown in **Figure 17**, US 26 within the Study Area is operating within ODOT standards. Detailed analysis worksheets are presented in **Appendix E-2**.

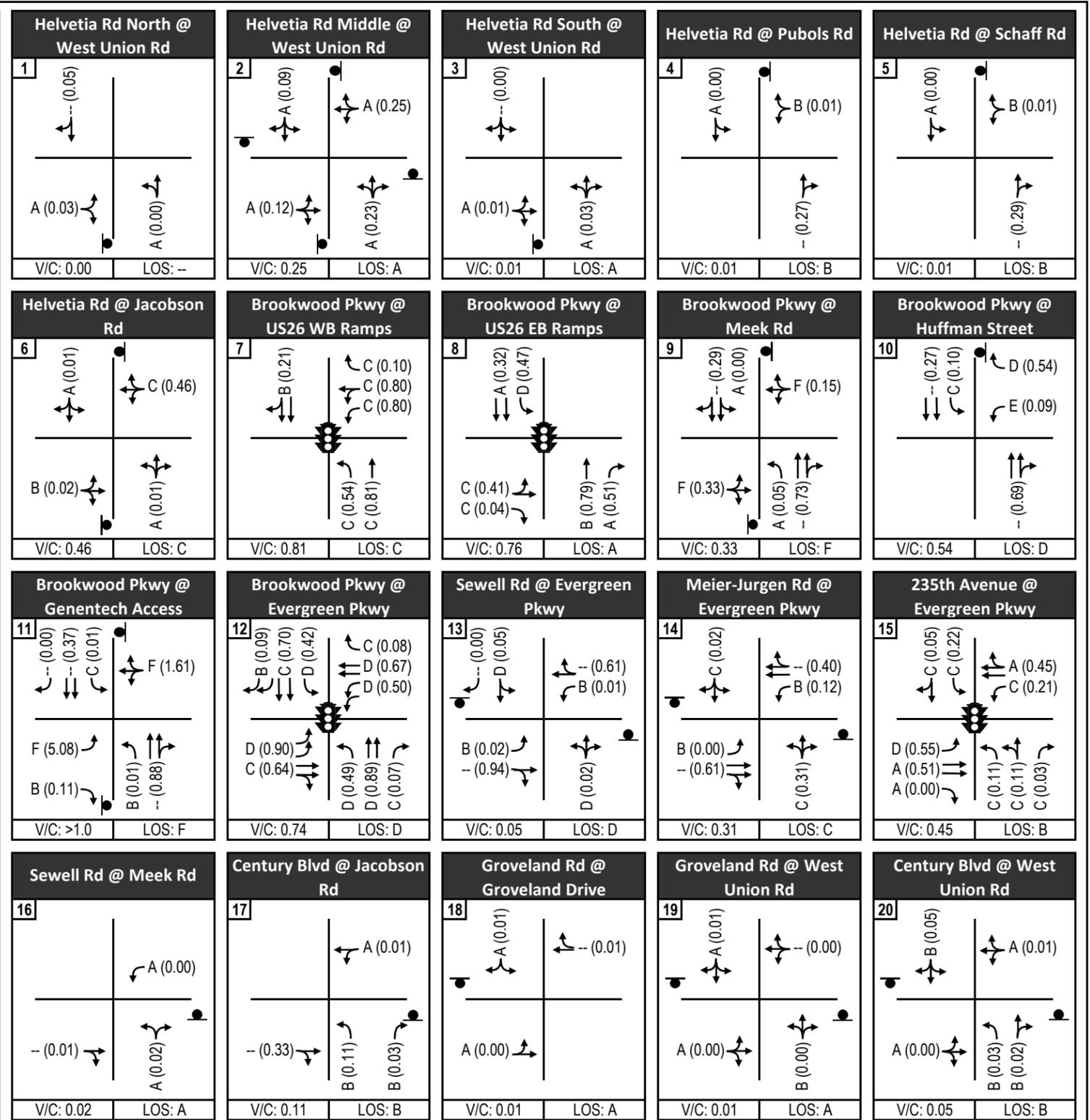
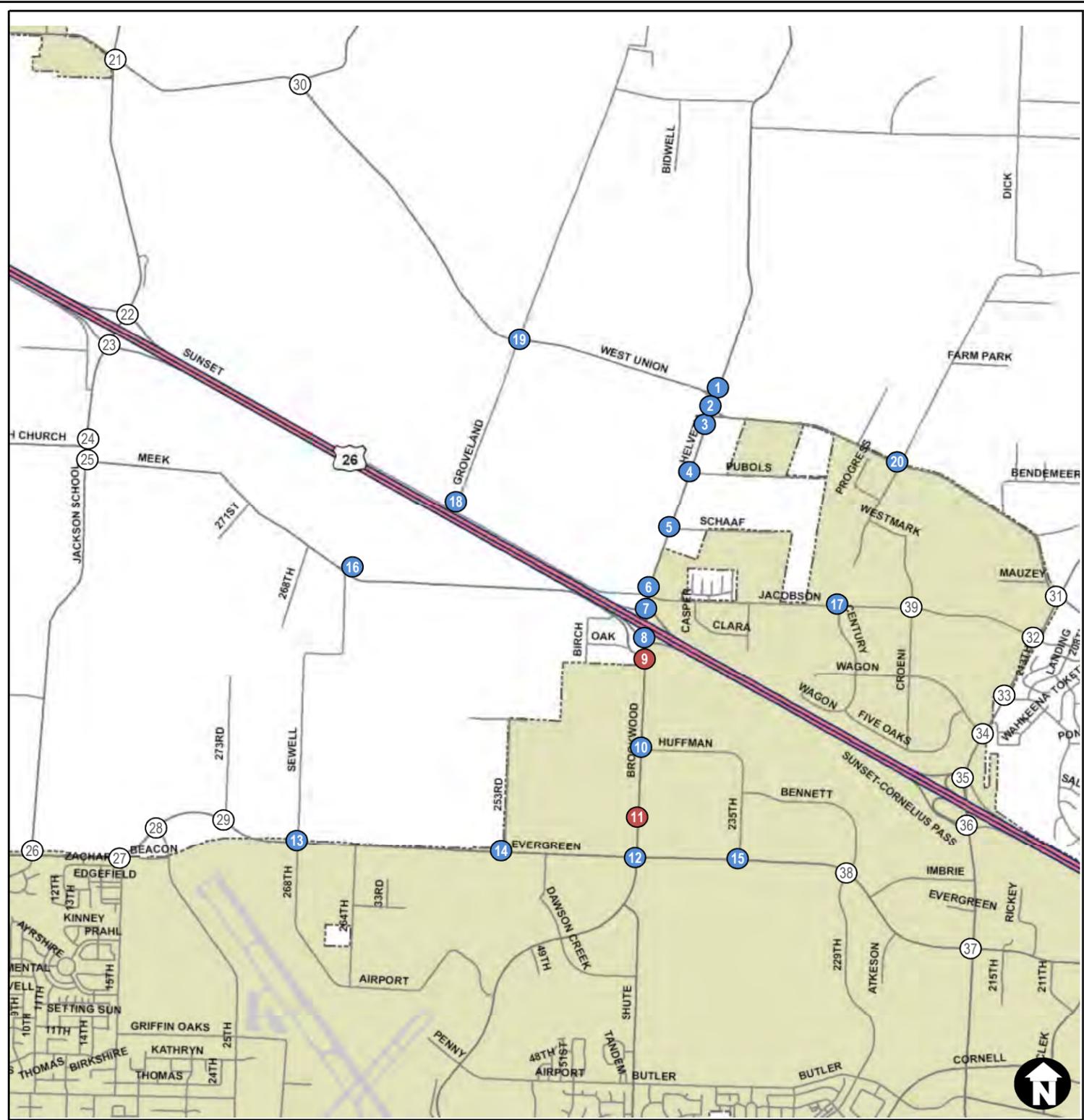


**Legend**

- Signalized intersection
- STOP Controlled Approach
- Lane Configuration
- V/C:** Volume-to-Capacity Ratio
- LOS:** Level of Service
- A (0.01)** Lane Group LOS (V/C)
- Intersection evaluated
- Intersection fails operational standard
- Intersection volumes shown on separate figure
- V/C: 0.01 | LOS: A** Overall Intersection Operations\*\*
- LOS not reported for free movements

\* V/C for unsignalized movement not accounted for in overall signalized intersection operations  
 \*\* Overall stop-controlled intersection operations reported for worst stopped movement

**FIGURE 14**  
**2011 Existing Conditions Operations AM Peak Hour**  
**US 26 / Brookwood / Helvetia IAMP**

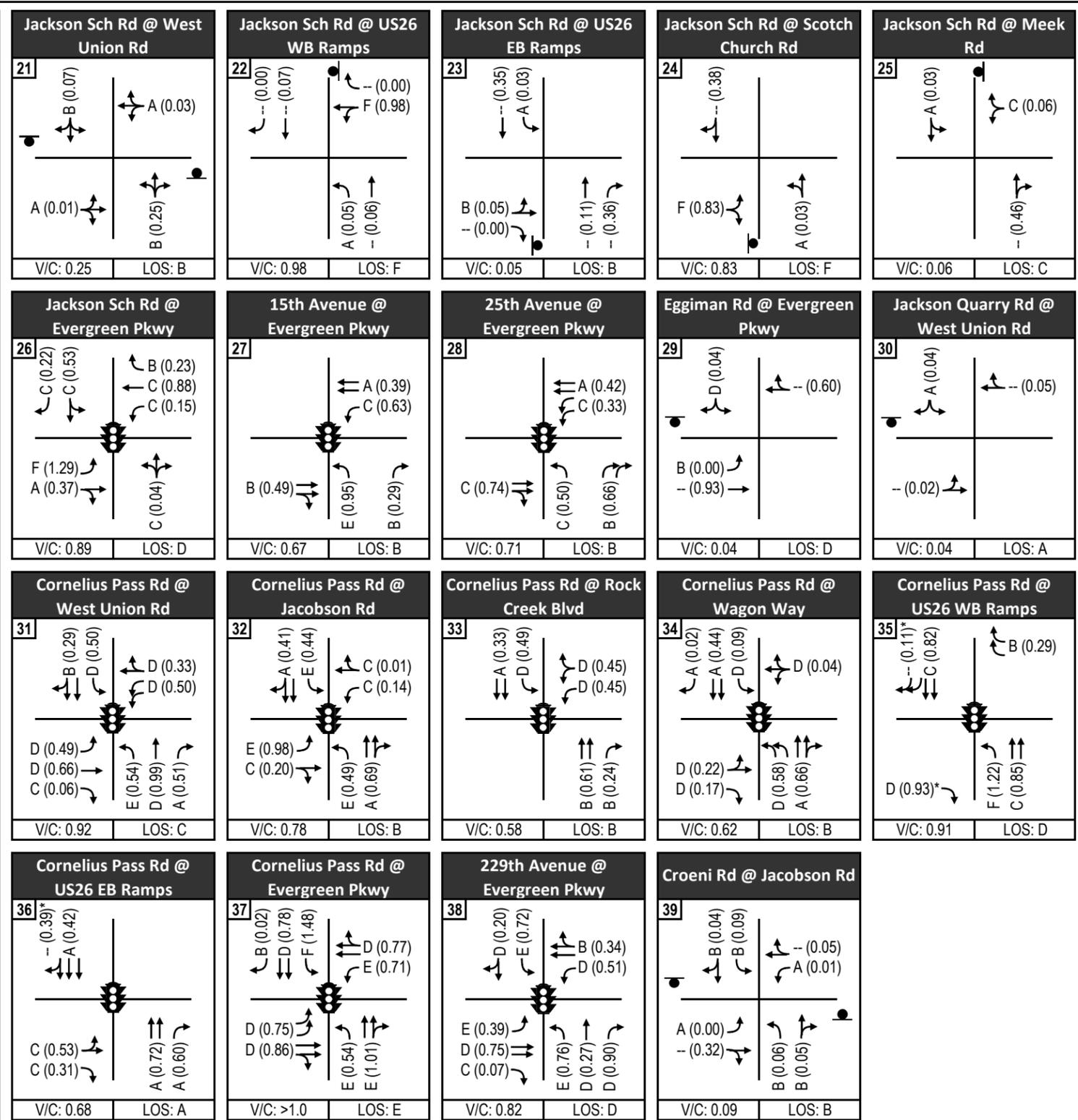
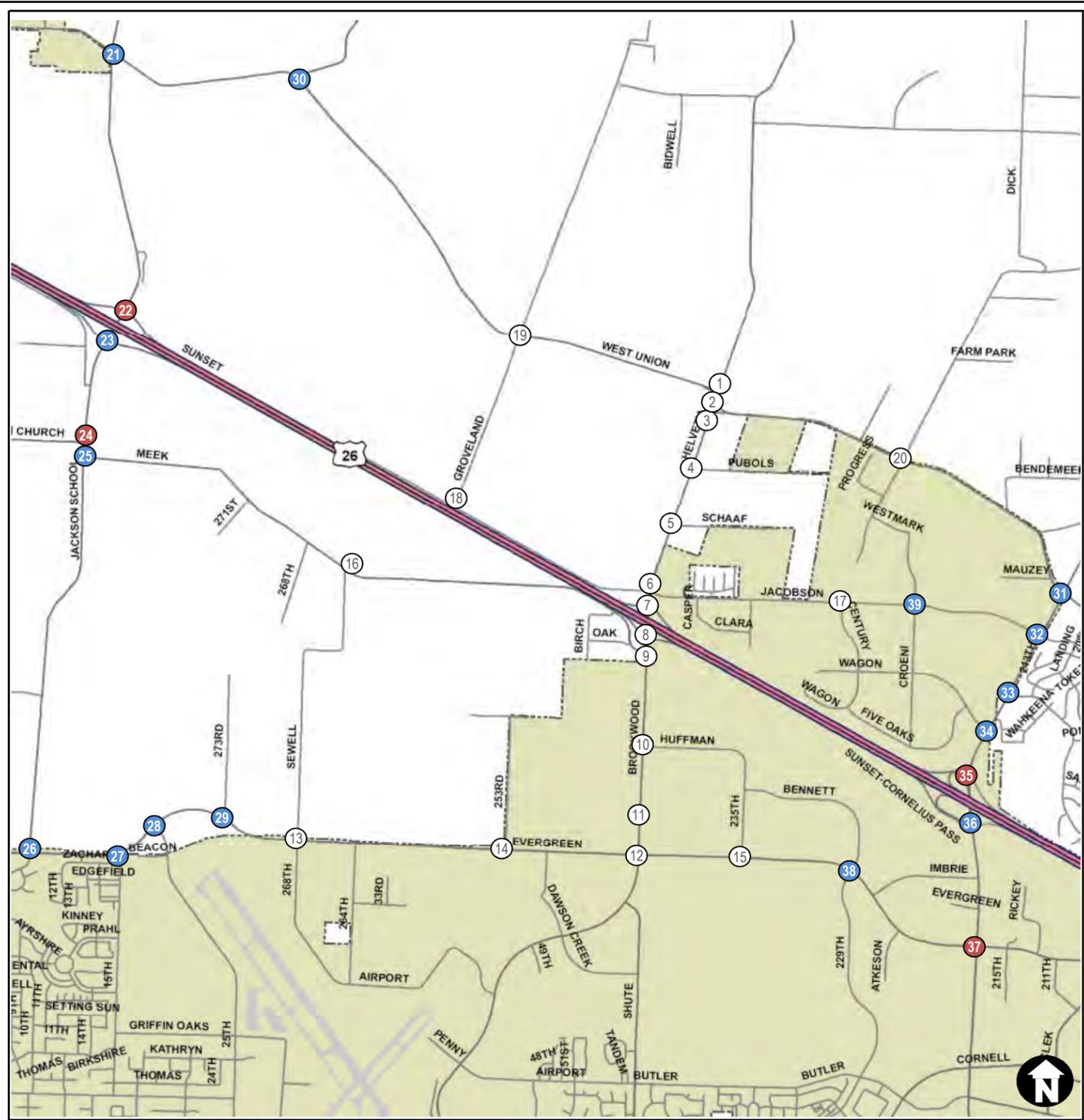


**Legend**

- Signalized intersection
- STOP Controlled Approach
- Lane Configuration
- v/c:** Volume-to-Capacity Ratio
- LOS:** Level of Service
- A (0.01)** Lane Group LOS (V/C)
- Intersection evaluated
- Intersection fails operational standard
- Intersection volumes shown on separate figure
- V/C: 0.01 LOS: A** Overall Intersection Operations\*\*
- LOS not reported for free movements

\*\*Overall stop-controlled intersection operations reported for worst stopped movement

**FIGURE 15**  
**2011 Existing Conditions Operations PM Peak Hour**  
**US 26 / Brookwood / Helvetia IAMP**

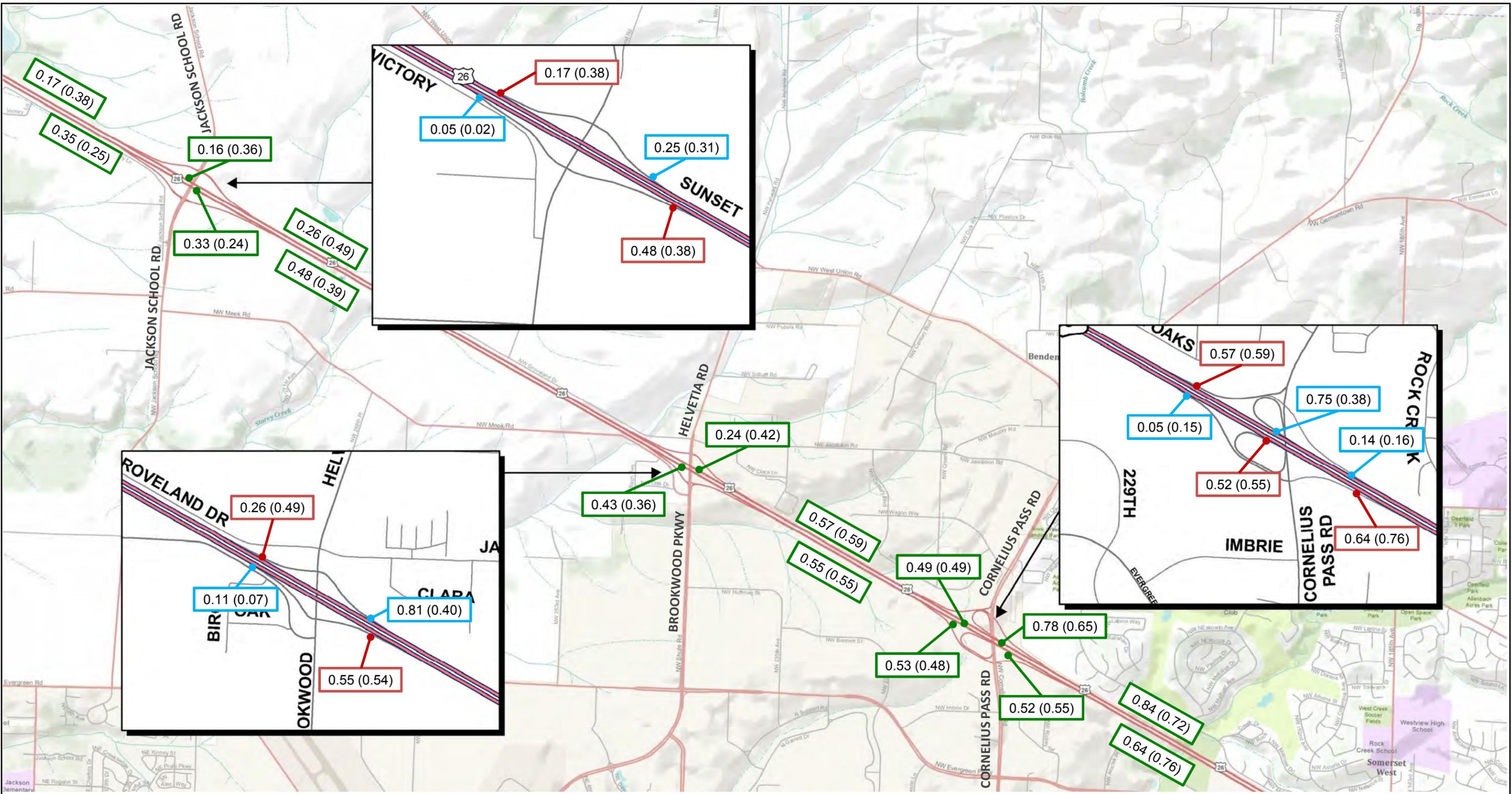


**Legend**

- Signalized intersection
- STOP Controlled Approach
- Lane Configuration
- v/c:** Volume-to-Capacity Ratio
- LOS:** Level of Service
- A (0.01)** Lane Group LOS (V/C)
- Intersection evaluated
- Intersection fails operational standard
- Intersection volumes shown on separate figure
- V/C: 0.01 LOS: A** Overall Intersection Operations\*\*
- LOS not reported for free movements

\* V/C for unsignalized movement not accounted for in overall signalized intersection operations  
 \*\*Overall stop-controlled intersection operations reported for worst stopped movement

**FIGURE 16**  
**2011 Existing Conditions Operations PM Peak Hour**  
**US 26 / Brookwood / Helvetia IAMP**



DAVID EVANS  
AND ASSOCIATES INC.



**Legend**

- Mainline
- Merge
- Diverge

**FIGURE 17**

**2011 Existing Conditions  
Freeway Operations  
AM and PM Peak Hours**

**US 26 / Brookwood / Helvetia IAMP**

## 4. EXISTING NATURAL AND HISTORIC RESOURCES ANALYSIS

Natural and historic resources were identified for this memorandum based on available map and database information from federal agencies, the State of Oregon, Metro, Washington County, the City of Hillsboro, and a neighborhood group called Save Helvetia. The information gathered was taken primarily from published documents and maps, agency websites, GIS data, and conversations with appropriate professional contacts. Information about wetlands, botanical resources, and aquatic resources also was taken from the Shute Road Interchange Improvement Project Environmental Baseline Report (EBR) (MB&G 2010). Although the EBR focused on an Area of Potential Influence (API) that was different from the IAMP Study Area, the areas overlap, and information common to both is included. The EBR API included more area to the west and south than the Study Area, as well as a long, narrow corridor along US 26.

For the EBR, the biological resources and issues within the API were identified based upon a review of existing database information, discussions with regulatory agency staff, and a field investigation conducted by Mason, Bruce & Girard, Inc. (MB&G) on February 3, 2010. At the time of the field investigation, ODOT did not have right-of-entry for areas outside of public rights-of-way. As such, areas outside of public rights-of-way were visually inspected from the road or highway. The field investigation was conducted to evaluate the baseline conditions for natural resources (i.e., aquatic/riparian conditions, presence of wetlands, habitat conditions, and noxious weed presence) within the EBR API. Before conducting the field investigation on February 3, 2010, MB&G obtained data regarding threatened and endangered species within the API from U.S. Fish and Wildlife Service (USFWS), StreamNet, and the Oregon Natural Heritage Information Center (ORNHIC, now Oregon Biological Information Center [ORBIC]). MB&G also contacted the Oregon Department of Fish and Wildlife (ODFW) to confirm current or historical native migratory fish presence within the API. **Table 6** summarizes identified resources, including key natural resources along Waibel Creek and potential cultural resource areas along Waibel Creek and the Five Oaks area.

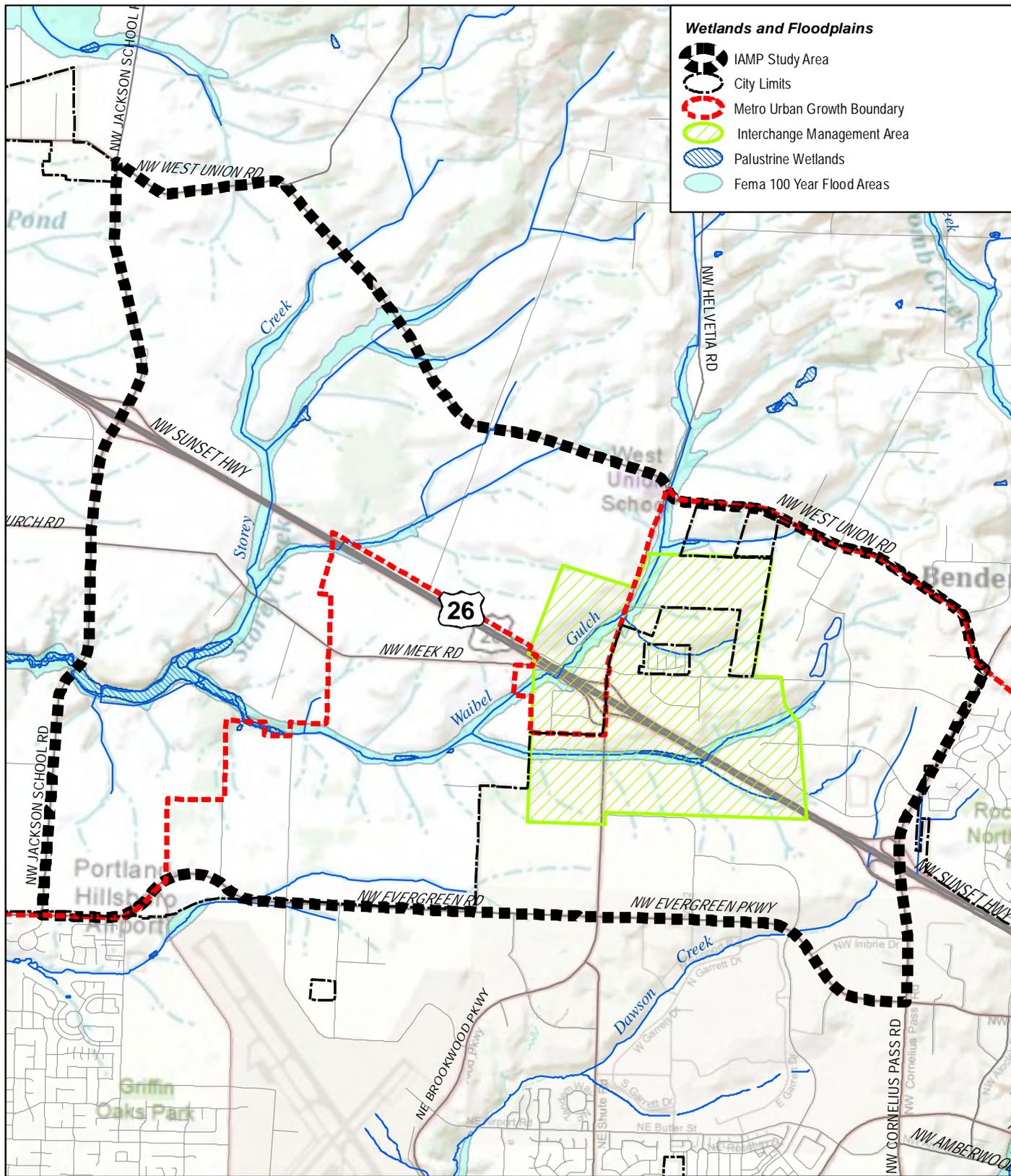
**Table 6. Summary of Identified Resources**

Resource Type	Resource	Location	Regulatory Authority
Parks and Recreation	Gordon Faber Park	South of US 26 and adjacent to Cornelius Pass Road	Local governments
Culverts	Culverts	Brookwood Parkway near interchange	Oregon Department of Fish and Wildlife U.S. Army Corps of Engineers
Floodplains	Waibel and Storey Creeks 100-year floodplains	Waibel Creek and tributaries near interchange	Federal Emergency Management Agency regulations administered through local governments
Goal 5 Resources*	Waibel, Storey, Dawson and Glencoe Creeks and tributaries riparian corridor	Waibel Creek and tributaries near interchange	Local governments
Wetlands	Unidentified wetlands associated with creeks and their tributaries	Waibel Creek and tributaries near interchange	U.S. Army Corps of Engineers Oregon Department of State Lands
Threatened and Endangered Species	Steelhead	Waibel and Storey Creeks	Oregon Department of Fish and Wildlife
Hazardous Materials	RCRA Generators, ERNS, ECSI, Fire Marshall Spill, Landfills, LUSTs, USTs*	Throughout Study Area	Oregon Department of Environmental Quality
Historic and Archaeological Resources	Historic and cultural resources	Along Waibel Creek and potential sites in various locations in Study Area	Local governments
Section 4(f) Resources*	Parks and Historic/Cultural Resources	Along Waibel Creek and potential sites in various locations in Study Area	Federal Highway Administration
Section 6(f) Resources*	None identified - Parks funded by Land and Conservation Funds	N/A	N/A

\* Resource Conservation and Recovery Act (RCRA), Emergency Response Notification System (ERNS), Environmental Cleanup Site Information (ECSI), leaking underground storage tanks (LUSTs), underground storage tanks (USTs)

## Floodplains and Floodways

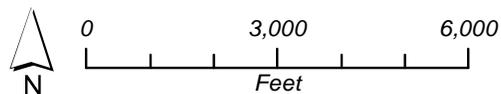
Acting through the local planning agencies, the Federal Emergency Management Agency (FEMA) regulates development within floodplains. FEMA-designated 100-year floodplains in the Study Area are displayed in **Figure 18** (FEMA Flood Insurance Rate Map panel 4102380350B, September 30, 1982). Waibel Creek parallels Helvetia Road north of US 26 and crosses under US 26. One of its tributaries crosses from north of US 26 and flows west under Brookwood Parkway, north of Huffman Street. Both Waibel Creek and its tributary have 100-year floodplains. West of the interchange, Storey Creek runs north to south in the Study Area west



**US 26/Brookwood Parkway/  
Helvetia Road IAMP**



**Figure 18**  
Wetlands and  
Floodplains



**Data Sources:**  
Metro RLIS GIS Data, 2011

of Groveland Road. Floodplains within the Study Area are designated Zone A: areas of 100-year flood and “flood hazard factors not determined”.

Members of Save Helvetia have several photos from February 1996 of flooding along Helvetia Road in the Study Area near the intersection of Groveland Road and Schaaf Road. In addition, drain tiles (perforated pipes that lie under the fields) that farmers have installed over the years drain south to this area.

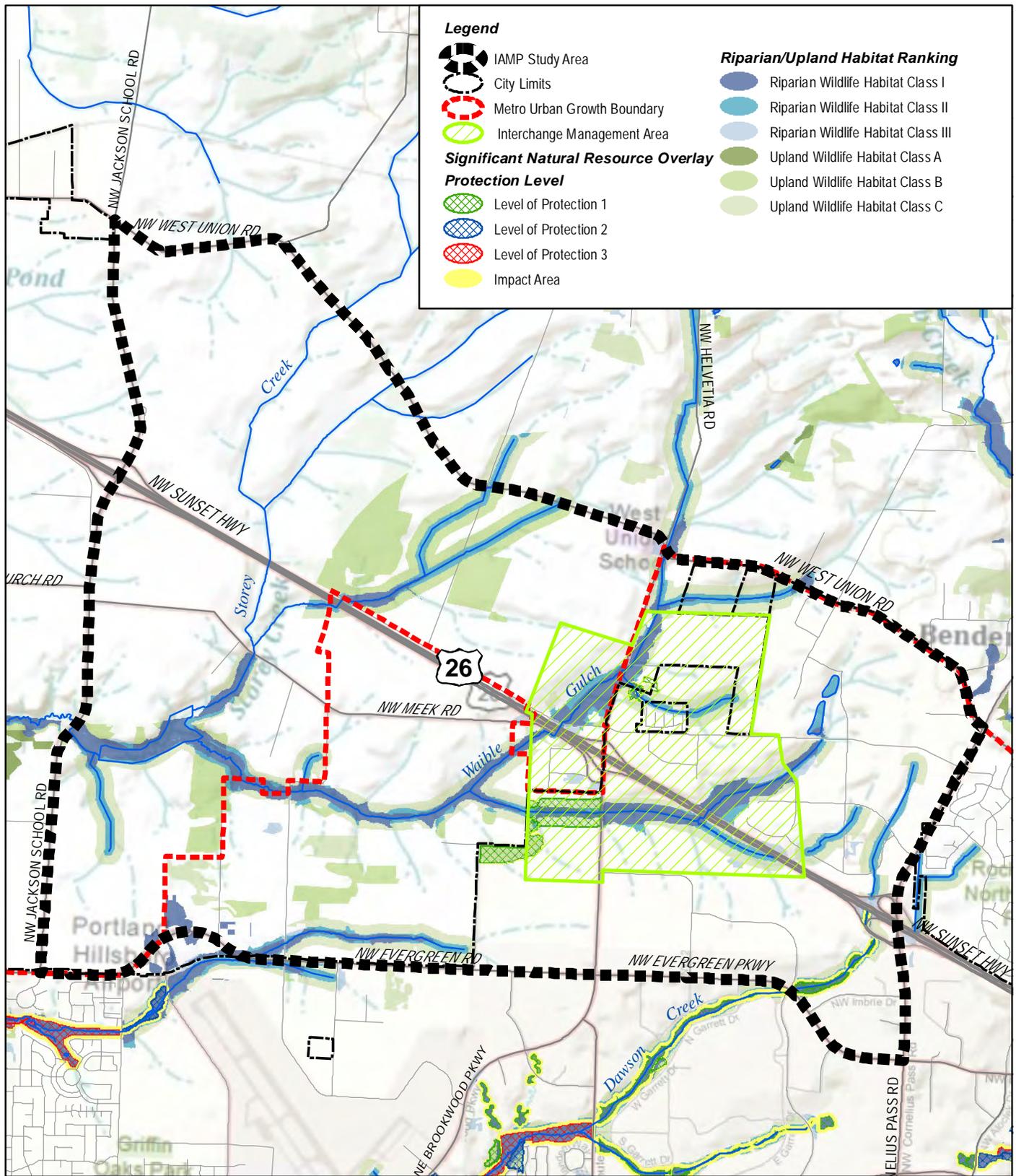
### Goal 5 Resources

Statewide Planning Goal 5 requires local jurisdictions to inventory natural resources such as riparian corridors and wildlife habitat. Metro-documented Goal 5 riparian corridors and upland wildlife habitat resources areas in the Study Area are shown in **Table 7** and on **Figure 19**. The Study Area is in the Lower McKay Creek streamshed.

**Table 7. Goal 5 Riparian Corridors and Upland Wildlife Habitat Resources Areas**

Location	Classification	Classification Definition
Adjacent to Waibel Creek and its tributaries (close to the interchange)	Riparian Wildlife Habitat Class I	Rivers, streams, stream-associated wetlands, undeveloped floodplains, forest canopy within 100 feet of a stream, and forest canopy within 200 feet of a stream with adjacent steep slopes (highest quality habitat)
Storey Creek and its tributaries (west of the interchange)	Riparian Wildlife Habitat Class I	Rivers, streams, stream-associated wetlands, undeveloped floodplains, forest canopy within 100 feet of a stream, and forest canopy within 200 feet of a stream with adjacent steep slopes (highest quality habitat)
Dawson Creek east of the interchange and a tributary of Glencoe Creek in the southern portion of the Study Area	Riparian Wildlife Habitat Class I	Rivers, streams, stream-associated wetlands, undeveloped floodplains, forest canopy within 100 feet of a stream, and forest canopy within 200 feet of a stream with adjacent steep slopes (highest quality habitat)
Adjacent to the creeks, mostly beyond the Class 1 Riparian areas	Class II riparian/wildlife corridors and Upland Wildlife Habitat Class C	Rivers, streams, 50-foot area along developed streams, forest canopy, or low structure vegetation within 200 feet of streams, and portions of undeveloped floodplains extending beyond 300 feet of streams and forest patches and smaller connector patches along streams and rivers
South of US 26, south of Birch Avenue	Upland Wildlife Habitat Class B	Forest patches with low structure connector patches along streams and rivers
Along the eastern tributary of Storey Creek	Upland Wildlife Habitat Class B	Forest patches with low structure connector patches along streams and rivers
Near 273 <sup>rd</sup> Avenue and Sewell Road	Upland Wildlife Habitat Class B	Forest patches with low structure connector patches along streams and rivers

Source: Metro.



**Legend**

- IAMP Study Area
- City Limits
- Metro Urban Growth Boundary
- Interchange Management Area

**Significant Natural Resource Overlay**

**Protection Level**

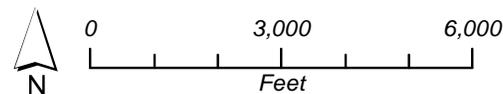
- Level of Protection 1
- Level of Protection 2
- Level of Protection 3
- Impact Area

**Riparian/Upland Habitat Ranking**

- Riparian Wildlife Habitat Class I
- Riparian Wildlife Habitat Class II
- Riparian Wildlife Habitat Class III
- Upland Wildlife Habitat Class A
- Upland Wildlife Habitat Class B
- Upland Wildlife Habitat Class C

**US 26/Brookwood Parkway/  
Helvetia Road IAMP**

**Figure 19**  
Goal 5 Resources



**Data Sources:**  
Metro RLIS GIS Data, 2011  
City of Hillsboro, Oregon, May 2010

## Wetlands

According to U.S. Fish and Wildlife Service National Wetlands Inventory data, one small area of palustrine wetland associated with the Waibel Creek tributary is located just south of where the tributary passes under US 26. Farther from the interchange, there are palustrine wetlands along Waibel and Storey Creeks south of US 26 and a small area along a tributary of Storey Creek north of US 26. Wetlands are displayed on **Figure 18**.

U.S. Department of Agriculture Natural Resources Conservation Service Soil Maps show hydric soils in the Study Area. Hydric soils indicate potential unmapped wetlands along and adjacent to Storey and Waibel Creeks and their tributaries, Dawson Creek and its tributaries in the eastern portion of the Study Area, and a tributary to Glencoe Creek in the southern portion of the Study Area along Evergreen Parkway.

## Threatened and Endangered Species

### *Plant Species*

The EBR API contains three general vegetation communities: riparian forest/wetland fringe, oak woodland, and disturbed/maintained grassland/highway right-of-way. The riparian forest/wetland fringe vegetation community is located adjacent to both unnamed tributaries to McKay Creek. The oak woodland vegetation community is located adjacent to Helvetia Road in the northern part of the API. The disturbed/maintained grassland/highway right-of-way vegetation community is located on both sides of US 26 and in the vicinity of the highway on- and off-ramps.

Data from the USFWS and ORNHIC within a two-mile radius of the proposed API indicate that several federal and state listed threatened and endangered plant species have the potential to occur within the API. A listing of these species, including their federal and state listing status, whether critical habitat is designated, blooming period, and habitat requirements, is shown in **Table 8**.

**Table 8. Rare Plant Species with the Potential to Inhabit the API**

Scientific Name	Common Name	Federal Status	State Status	Critical Habitat (Y/N)	Blooming Period	Habitat
<i>Lupinus sulphureus</i> ssp. <i>kincaidii</i>	Kincaid’s lupine	T	T	Yes*	April–July	Upland prairie grasslands, oak savanna, and woodland edges
<i>Sidalcea nelsoniana</i>	Nelson’s sidalcea	T	T	No	May–September	Open areas on damp soil, in meadows, wet prairie remnants, fencerows, roadsides, deciduous forest edges, and occasionally Oregon ash wetlands
<i>Aster curtus</i>	White-topped aster	T	T	No	July–August	Low elevation, moist native prairies, on well-drained upland soils in oak savannas
<i>Castilleja levisecto</i>	Golden Indian paintbrush	E	E	No	May–June	Moist or wet meadows and native prairies at low elevations
<i>Delphinium leucophaem</i>	White rock larkspur	E	E	No	May–August	Dry roadside ditches, cliffs, rocky slopes and lowland meadows, at cliff bases, and basaltic ledges
<i>Dephinium pavonaceum</i>	Peacock larkspur	E	E	No	April–mid-July	Well drained areas of native prairie, roadsides with no development
<i>Erigeron decumbens</i> var. <i>decumbens</i>	Willamette daisy	E	E	No	May–mid-August	Native wetland and upland prairie, oak savanna, heavier soils, restricted to native prairie grassland

E = Endangered; T = Threatened; SOC = Species of Concern

\*The designated Critical Habitat for Kincaid’s lupine is not located within the vicinity of the API.

The EBR API contains potentially suitable habitat for all the species listed in **Table 8**. In particular, suitable habitat is located within the open grass fields, fencerows, and oak groves of the EBR API.

**Terrestrial Wildlife Species**

Review of data available from the USFWS and ORNHIC within a two-mile radius of the EBR API indicates that several federal and state listed terrestrial wildlife species have the potential to occur within the EBR API. A listing of these species, as well as their federal and state listing status, whether critical habitat is designated, and habitat requirements, is shown in **Table 9**.

**Table 9. Terrestrial Wildlife Species with the Potential to Inhabit the API**

Scientific Name	Common Name	Federal Status	State Status	Critical Habitat (Y/N)	Habitat
<i>Strix occidentalis caurina</i>	Northern spotted owl	T	T	Yes	Inhabits forests characterized by dense canopy closure of mature and old-growth trees, abundant logs, standing stags, and live trees with broken tops
<i>Brachyramphus marmoratus</i>	Marbled murrelet	T	T	Yes	Nests in forest stands with old growth forest characteristics; forests are generally characterized by large trees with large branches or deformities for use as nest platforms
<i>Eremophila alpestris strigata</i>	Streaked horned lark	C	N/A	No	Associated with bare ground or sparsely vegetated habitats; nests in grass seed fields, pastures, fallow fields and wetland mudflats

E = Endangered; T = Threatened; C = Candidate

The forested areas within the EBR API, which predominantly consist of small oak groves, do not have the habitat characteristics required by either the northern spotted owl or the marbled murrelet. Although critical habitat has been designated for both species, the closest occurrence of critical habitat for both species is located in the Coast Range, more than five miles to the west of the EBR API. Similarly, the EBR API does not contain suitable habitat for the streaked horned lark, which utilizes bare ground or sparsely vegetated habitats. No such habitats are present within the EBR API. The EBR API does contain potential habitat for nesting migratory birds since they may utilize trees and shrubs located throughout the EBR API.

**Fish and Aquatic Resources**

Review of data available from StreamNet and ORNHIC within a two-mile radius of the proposed EBR API indicates that steelhead (*Oncorhynchus mykiss*) of the Upper Willamette River (UWR) Distinct Population Segment (DPS) has the potential to occur within the proposed EBR API, but there is no designated critical habitat. This species is federally listed as Threatened (T) and state listed as Sensitive Vulnerable (SV). The distribution within the vicinity of the EBR API is the Tualatin River and its tributaries for rearing and migration.

Two unnamed tributaries to McKay Creek are located within or near the EBR API (170900100107 6<sup>th</sup> Field Hydrologic Unit Code [HUC]): the northern unnamed tributary and the southern unnamed tributary. The northern unnamed tributary flows southwest across the EBR API and underneath US 26 through a concrete box culvert that is approximately 8 feet by 8 feet in diameter. Within the EBR API, this tributary is approximately 10 feet wide and 5 feet deep. North of US 26, this tributary is bordered on either side by a wetland dominated by reed canarygrass. South of US 26, the riparian area consists of reed canarygrass in the understory, with red alder and Oregon ash in the overstory. The southern unnamed tributary to McKay Creek flows west south of the EBR API. The confluence of the unnamed tributaries with the mainstem of McKay Creek is located approximately 1.5 miles downstream (southwest) of the

EBR API. Approximately five miles downstream from this confluence, McKay Creek flows into Dairy Creek, which then flows into the Tualatin River within two miles of the McKay/Dairy Creek confluence. UWR DPS steelhead utilize McKay Creek for rearing and migration. The upstream extent of steelhead distribution is located approximately one mile downstream (southwest) of the EBR API. The unnamed tributaries to McKay Creek do not currently provide rearing and migration habitat for UWR steelhead. The habitat within these unnamed tributaries is considered low quality because of the following factors: (1) the streambed is composed largely of silt and sand, (2) there is minimal riparian vegetation, and (3) there is a general lack of channel complexity. McKay Creek is mapped as Essential Salmonid Habitat (ESH) according to the Oregon Department of State Lands. However, the ESH designation does not extend into the two unnamed tributaries of McKay Creek located within the EBR API.

Although steelhead and other native migratory fish do not currently utilize the tributaries within the EBR API, it is likely that steelhead and native migratory fish used these tributaries historically. This determination is based on an investigation of accessible portions of the two unnamed tributaries to McKay Creek within the EBR API on February 3, 2010, and a review of U.S. Geological Survey topographic maps (Hillsboro, Oregon Quadrangle, USGS 1986) for the area. In particular, the size of each unnamed tributary suggests that this system likely supported fish in its upper reaches. Additionally, although man-made barriers (i.e., culverts) to fish passage may have been constructed recently, there are no natural barriers to upstream fish passage within McKay Creek or its tributaries. Lack of current use by native migratory fish is likely due to degradation of stream habitat as a result of development of the surrounding areas. The Oregon Department of Fish and Wildlife (ODFW) has determined that there was historical use of these streams by native migratory fish. This determination was based upon the physical attributes of the tributaries, the lack of natural barriers downstream, and the size of the drainage basins.

### ***Federal Species of Concern***

In addition to the Threatened and Endangered (T&E) species information provided in the EBR, a non-profit community organization called Save Helvetia conducted wildlife and Oregon white oak studies in the area, and provided information regarding federal species of concern known to occur within or near the Study Area. The acorn woodpecker is known to occur within the API, and the Northern Pacific pond turtle is known to occur outside, but near, the API. This information is summarized in **Table 10**.

**Table 10. Special Status Species Known to Occur within the EBR API**

Common Name	Scientific Name	Status		Location
		Federal	State	
Northern Pacific pond turtle	<i>Actinemys marmorata marmorata</i>	Species of Concern	Sensitive-Critical	Ponds at 307 <sup>th</sup> Street near intersection of US 26/Glencoe Road north at North Plains (outside Study Area)
Acorn woodpecker	<i>Melanerpes formicivorus</i>	Species of Concern	Sensitive-Vulnerable	Seen in Oregon white oak trees at the Five Oaks Meeting Place south of Jacobsen Road.

“Species of Concern” is an informal term under the federal listing that is not specifically defined in the federal Endangered Species Act. The term commonly refers to species that are declining or appear to be in need of conservation.

Under Oregon’s Sensitive Species Rule (OAR 635-100-040), a “sensitive” species classification was created that focuses fish and wildlife management and research activities on species that need conservation attention. “Sensitive” refers to naturally reproducing fish and wildlife species, subspecies, or populations that are facing one or more threats to their populations and/or habitats. Implementation of appropriate conservation measures to address the threats may prevent them from declining to the point of qualifying for threatened or endangered status. Sensitive species are assigned one of two subcategories: critical or vulnerable. “Critical” sensitive species are imperiled with extirpation from a specific geographical area of the state because of small population sizes, habitat loss or degradation, and/or immediate threats. Critical sensitive species may decline to the point of qualifying for threatened or endangered status if conservation actions are not taken. “Vulnerable” sensitive species are facing one or more threats to their populations and/or habitats. Although not currently imperiled with extirpation from a specific geographical area of the state, vulnerable species could, however, become so with continued or increased threats to populations and/or habitats.

**Non-Federally Listed Plant and Wildlife Species**

In 2009, Save Helvetia conducted wildlife and Oregon white oak studies which showed that Oregon white oak trees are present in several locations within the IAMP Study Area. The species shown in **Table 11** below are listed as Sensitive-Vulnerable by the State of Oregon and are highly dependent upon oak for their life cycles. They are also listed as target species in the Oregon Conservation Strategy (ODFW 2006).

**Table 11. Non-Federally Listed Species Likely to Occur Within the IAMP Study Area**

Common Name	Scientific Name	Status		Location
		Federal	State	
White-breasted nuthatch	<i>Sitta carolinensis aculeata</i>	--	Sensitive-Vulnerable	Specific location not given.
Western bluebird	<i>Sialia mexicana</i>	--	Sensitive-Vulnerable	Specific location not given.
Western gray squirrel	<i>Sciurus griseus</i>	--	Sensitive-Vulnerable	Specific location not given.

Although specific locations were not provided by Save Helvetia, it is likely that these species may be present in some or all of the remnant oak patches. The wildlife study conducted by Save Helvetia also showed that Roosevelt elk herds utilize the IAMP Study Area as a wildlife corridor, which extends from Forest Park to the west of North Plains. The earliest reported sightings were from 1965. During the study, the size of the elk herd ranged from 20 to 82, with the majority of sightings in the 35 to 40 range. The IAMP Study Area also provides habitat for a variety of animals such as deer, elk, black bear, bobcat and cougar, and others.

The EBR identified three general vegetation communities in the API: riparian forest/wetland fringe along the McKay Creek unnamed tributaries, oak woodland adjacent to Helvetia Road, and disturbed/maintained grassland/highway right-of-way adjacent to the highway facilities.

### Hazardous Materials

On April 5 and 6, 2011, federal and state databases were searched for identified hazardous waste sites within a radius of one mile from the approximate center of the US 26/Brookwood Parkway/Helvetia Road interchange (Leaking Underground Storage Tanks, or LUSTs, are identified within the Study Area or on adjacent properties).

**Table 12** summarizes the databases searched and the total number of sites found. Background data files for each identified site are in **Appendix F**.

**Table 12. Federal and State Hazardous Material Databases Reviewed and Sites Found**

Database	Description	Total Sites Found
<b>Federal</b>		
National Priority List (NPL)	List of national priorities among the known releases or threatened releases of hazardous substances, pollutants, or contaminants	0
Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS)	Abandoned hazardous waste sites—"Superfund"	0
Resource Conservation and Recovery Act (RCRA) Generators	Generate or store defined amount of hazardous waste in any one calendar month and are subject to regulatory control	10
Emergency Response Notification System (ERNS)	Releases or potential releases reported to the National Response Center, which acts as a reporting center for the Environmental Protection Agency and U.S. Coast Guard	3
<b>State</b>		
Environmental Cleanup Site Information System (ECSIS)	Sites that may be contaminated or require cleanup	3
Oregon State Fire Marshal's (OSFM) Hazardous Materials Incidents	All hazardous material emergency incidents to which Fire Marshal Hazardous Materials Response Teams have responded	6
Oregon Permitted Solid Waste Landfills	Current active permitted facilities including landfills, waste tire storage sites, and household hazardous waste sites	0
Department of Environmental Quality (DEQ) Facility Profiler Leaking Underground Storage Tanks (LUSTs)	Known sites where leaks in buried tanks have been reported	8
Underground Storage Tanks (USTs)	Registration, installation, operation, and removal of USTs; cleanup of soil and groundwater contamination from petroleum leaks	0

Table 13 lists reported sites and incidents.

**Table 13. Hazardous Material Reported Sites and Incidents**

Site Name	Location	Effective Date/Incident Date	Generator Type/Status/Release Type
<b>RCRA</b>			
Shinei USA Inc.	6220 NW Pinefarm Place, Hillsboro	12/03/2007	Conditionally Exempt Generator
Credence Systems Corporation	5975 NW Pinefarm Place, Hillsboro	12/31/2008	Conditionally Exempt Generator
Genentech Inc.	4625 NW Brookwood Parkway, Hillsboro	12/31/2010	Small Quantity Generator
SGL Carbon Corporation	4860 NW Shute Road, Hillsboro	01/15/2003	Conditionally Exempt Generator
Mohr Solutions Power	23780 NW Huffman Street, Door 112, Hillsboro		Treater, Storer, Disposer
Ohka America Inc.	4600 NW Brookwood Parkway, Hillsboro	12/31/2010	Large Quantity Generator
Tokai Carbon USA Inc.	4495 NW 235 <sup>th</sup> Avenue, Hillsboro	12/13/2003	Conditionally Exempt Generator
AGPR, Inc.	4375 NW 235 <sup>th</sup> Avenue, Hillsboro	01/0120/04	Conditionally Exempt Generator
Ashland Inc.	4605 NW 235 <sup>th</sup> Avenue, Hillsboro	12/31/2007	Conditionally Exempt Generator
Intel Corporation Evergreen Campus	23225 NW Evergreen Parkway, Hillsboro	12/31/2006	Conditionally Exempt Generator
<b>ERNS</b>			
N/A	5775 NW Wagon Way	09/07/2004	Released hydraulic oil
N/A	23585 NW Jacobsen Road	06/14/2000	Released acid wash
N/A	25300 NW Evergreen Road	01/14/1997	Released oil (misc: transformer)
<b>ECSIS</b>			
Westmark Center	West Union Road & Jacobson Road, Hillsboro (Township 1N, Range 2W, Section 21, Tax Lots: 1600, 2601, 2700, 2800, 2801, 2802, 2900, 3000, 3001, and 3002)	01/18/2004	Requires No Further Action
Baker Site	East of Helvetia Road, south of Schaaf Road, Hillsboro (Township 1N, Range 2W, Section Tax Lot 1500)	02/10/2009	Requires No Further Action
Shute Road Property	Evergreen Parkway and Shute Road, Hillsboro (Township 1N, Range 2W, Section 21, Tax Lots: 1600, 2601, 2700, 2800, 2801, 2802, 2900, 3000, 3001, and 3002)	06/22/2005	Requires No Further Action

Site Name	Location	Effective Date/Incident Date	Generator Type/Status/Release Type
<b>OSFM</b>			
N/A	US 26 @ MP 61	09/16/1998	Released 30 gallons diesel
N/A	US 26 WB @ Shute Road	04/17/1997	Released 135 gallons diesel
N/A	22800 NW Evergreen Road	10/31/1988	Released 5 gallons unknown
N/A	24945 NW Evergreen Road	01/09/1988	Released 30 gallons diesel
N/A	2501 NW 229 <sup>th</sup> Avenue	11/18/1996	Released 2 cubic feet of acetic acid
N/A	7431 Evergreen Parkway	04/16/1991	Released 15 gallons gasoline
<b>LUSTs</b>			
Stranding Holdings LLC	5870 NW 242nd Avenue, Hillsboro	03/18/2003	Cleanup Completed
Baxter, B	27700 NW Meek Road, Hillsboro	03/09/2000	Cleanup Completed
Berger Farms	5888 NW Shute Road, Hillsboro	N/A	Cleanup Started
Berger Farms	5870 NW 242 <sup>nd</sup> Avenue, Hillsboro	11/19/2001	Cleanup Completed
Laas, Donnie	6140 NW Birch Avenue, Hillsboro	09/12/2007	Cleanup Completed
Hagg, R	4825 NW 253 <sup>rd</sup> Avenue, Hillsboro	08/27/2004	Cleanup Completed
West Union Elementary School	23870 NW West Union Road, Hillsboro	09/10/2001	Cleanup Completed
Severson Property	23265 Evergreen Parkway	08/31/2000	Cleanup Completed

Source: Federal and state hazardous material databases, 2011.

The identified sites and incidents have been remediated, are being monitored, have been investigated and found not to be contaminated to the point of needing further action, or are a permitted facility. The land within the Study Area has been previously disturbed by transportation uses that may include undocumented spills or an accumulation of many years of roadway runoff, has been historically disturbed by agricultural uses that may include the use of chemical pesticides, and contains industrial uses that generate hazardous materials, and there may be undocumented hazardous materials present. Mercury vapor lamps and treated timbers may be present in the Study Area and would require special handling if they need to be removed or replaced.

## Historic and Archaeological Resources

This section summarizes the Oregon State Historic Preservation Office (SHPO) Oregon Historic Sites Database that documents National Register of Historic Places (NRHP) and locally identified historic, prehistoric, and cultural resources. The NRHP identifies and documents (in partnership with state, federal, and tribal preservation programs) districts, sites, buildings, structures, and objects that are significant in American history, architecture, archaeology, engineering, and culture. Copies of Oregon Historic Site Records for each site referenced in **Table 14** are in **Appendix G**. The following resources in the Study Area are in the SHPO database:

**Table 14. Oregon Historic Sites Database Results for the Study Area**

Resource Name	Address	Resource Type	Year Built
<b>Listed on the NRHP Register</b>			
Rice NW Museum of Rocks and Minerals (Richard and Helen Rice)	26385 NW Groveland Drive	Single dwelling, ranch	1953
West Union Baptist Church	22365 NW West Union Road	Religious facility, vernacular	1853
<b>Eligible Contributing (potentially eligible for NRHP Register)</b>			
James & Mary Chambers House*	24665 NW Groveland Drive	Single dwelling, vernacular	1865
T W & Lizzie Shute House & Barn*	4825 NW 253 <sup>rd</sup> Avenue	Single dwelling, Queen Anne	1890
Imbrie Farm Agricultural Outbuilding	21860 NW Imbrie Drive	Italianate	1866
Farmstead House and Outbuildings	9220 NW Jackson School Road	Victorian Eclectic	1890
<b>Resources in the database but unknown whether they are eligible for NRHP listing</b>			
Five Oaks Meeting Place*	NW Casper Lane	Social	1830
Methodist Meeting House Site	east of 253 <sup>rd</sup> Avenue	N/A	1843
Sewell Clay Works	Evergreen Road & Sewell Road	N/A	1880

\* Also designated an historic landmark or resource by Washington County.

Historic maps and aerial photographs suggest additional historic resources may be present in the Study Area: two buildings, the Edward Constable homestead, an unnamed wagon road, and the Alexander Zachary stable.

The ODOT 2010 survey for the EBR identified three additional houses that may be eligible for listing on the NRHP: 5830 NW Shute Road, 5870 NW Shute Road, and 6160 NW Birch Avenue.

The Shute Road UGB Addition Concept Plan Cultural Resources Technical Memorandum (AINW, no date) identified these additional locations within the Study Area that may be eligible or listing on the NRHP:

- The Voges home, a residence at the intersection of Shute Road and Meek Road, is thought to date to 1914 but is probably older. The home is listed in the Washington County Cultural Resource Inventory.

- The historic Reilly residence on Evergreen Parkway, which probably dates to the 1890s, is extant. The house and some of the associated farm buildings may be significant historic resources.

The Shute Road UGB Addition Concept Plan Cultural Resources Technical Memorandum (AINW, no date) identified these additional locations within the Study Area that are of archaeological interest:

- The area along the Waibel Creek channel is considered to have a moderate potential for prehistoric archaeological resources. The creek channel has been modified in the EBR API but generally follows its natural course. Proximity to the creek enhances the likelihood of archaeological resources, but the EBR API does not offer significantly higher ground adjacent to the water source. Therefore the location is considered to be a moderate-probability rather than a high-probability location. The archaeological sensitivity area is defined as extending 30 meters (100 feet) on each side of the existing creek channel (total width of 60 meters) within the EBR API.
- Artifacts and other archaeological deposits may be associated with the reported location of a late-nineteenth-century residence behind a modern residence within the EBR API.

Archaeological resources have been found in the Study Area; two sites have been identified north of US 26 and four sites south of US 26. Locations of archaeological sites are kept confidential to avoid disturbance. An ODOT field investigation conducted on February 11, 2010, identified no archaeological resources for the EBR API. Ten previous cultural resources studies have been conducted in the Study Area vicinity. However, most of the Study Area has not been examined for archaeological resources. There may be additional historic and archaeological resources in the Study Area that have not been surveyed or evaluated for eligibility. Portions of the Study Area consist of flat ground with water resources—the two main components that archaeologists look for to identify high probability locations for potential archaeological sites. ODOT consulted local representatives from the Confederated Tribes of the Warm Springs, the Confederated Tribes of the Siletz Indians, and the Confederated Tribes of the Grand Ronde regarding the Shute Road Improvements Project. The representative from the Grand Ronde Tribes informed ODOT that there is a known archaeological site located on private property, but the exact location is unknown.

## Section 4(f) Resources

Section 4(f) refers to a part of federal law (Title 23, USC, Section 138, Section 4(f) of the Department of Transportation Act of 1966, as amended) that protects public parks, recreation lands, wildlife and waterfowl refuges, and public or private historic sites. Section 4(f) applies only to Departments of Transportation and their agencies. Section 4(f) resource lands within the Study Area consist of the historic sites discussed previously in the section titled *Historic and Archaeological Resources* and the Gordon Faber Recreation Complex. In addition, structures eligible or potentially eligible for inclusion on the NRHP but not yet identified are potential

candidates for Section 4(f) status. No wildlife and waterfowl refuges are located within the EBR API.

A highway project is considered to “use” a public park when:

- Land is permanently incorporated into a transportation facility (actual conversion);
- There is a temporary occupancy of land that is adverse in terms of the statute’s preservationist purpose; or
- There is constructive use of the land.

Constructive use means off-site impacts of the transportation project substantially impair the site’s vital functions.

### **Section 6(f) Resources**

The Land and Water Conservation Fund (LWCF) Act of 1965 established grants-in-aid funding to assist states in the planning, acquisition, and development of outdoor recreational land and water areas and facilities. Section 6(f) of the LWCF Act prohibits the conversion of property acquired or developed with the assistance of the fund to anything other than public outdoor recreation use without the approval of the Secretary of the U.S. Department of the Interior. No Section 6(f) properties are located in the Study Area.

## 5. REFERENCES

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## **Appendix ° . Tax Lots within One-Quarter-Mile of the Interchange**



**Appendix B: Tax lots within one-quarter-mile of the interchange**

**North of US-26 (Helvetia Road)**

Tax Lot #	Address	Ownership	Type of Use	Type of Approach	Location of Lot	Location of Approach	Estimated Approach Width (ft)	Zoning	Lot Size (Acres)
1N2150001400	24250 NW GROVELAND DR.	John Wassmer	Residential	Private	West	Groveland Dr	44	EFU	0.40
1N2150000900	24665 NW GROVELAND DR.	Standing Groveland	Agricultural	Private	West	Groveland Dr	17	EFU	21.51
1N2150000901	Undeveloped/No address	Standing Holdings LLC	Agricultural	Private	West	N/A	N/A	EFU	36.62
1N215CC00300	Undeveloped/No address	Pacific Realty Associates	Undeveloped	Private	East	N/A	N/A	M-P	1.60
1N215CC00600	Undeveloped/No address	Cindy C. Lee	Agricultural	Private	East	N/A	N/A	HSID	7.00
1N215CC00500	Undeveloped/No address	David M. Edwards	Agricultural	Private	East	N/A	N/A	HSID	2.24
1N2150000600	Undeveloped/No address	Dewayne & Daphne Wafford	Agricultural	Private	East	N/A	N/A	HSID	51.20
1N2150000607	6800 NW HELVETIA RD.	Junhi & Haesoon Hong	Residential	Private	East	Schaff Rd	20	FD-20	4.12
1N2150000603	6800 NW HELVETIA RD.	Junhi & Haesoon Hong	Residential	Private	East	Schaff Rd	20	FD-20	2.98

**South of US-26 (Brookwood Parkway)**

Tax Lot #	Address	Ownership	Type of Use	Type of Approach	Location of Lot	Location of Approach	Estimated Approach Width (ft)	Zoning	Lot Size (Acres)
1N221AA01200	24215 NW MEEK RD.	Garrold C. Shurtz - Living Trust	Residential	Private	West	Meek Rd	6	AF-5	1.34
1N221AA01100	Undeveloped/No address	PJ Properties LLC	Undeveloped	Private	West	Brookwood Pkwy	18	AF-5	1.14
1N2210003100	5455 NW BIRCH AVE.	Keith A. & Rebecca Berger	Agricultural	Private	West	N/A	N/A	SSID M- P	42.22
1N2210002601	Undeveloped/No address	Herbert L. & Hazel I. Moore - Trust	Undeveloped	Private	West	N/A	N/A	SSID M- P	0.54
1N2220000200	Undeveloped/No address	Nike Foundation	Agricultural	Private	East	N/A	N/A	M-P	75.43
1N2220002800	5830 NW BROOKWOOD PKWY.	Ruth I. Berger - Trust	Agricultural	Private	East	Meek Rd	21	M-P	6.23
1N2220002900	5870 NW BROOKWOOD PKWY.	Ruth I. Berger - Trust	Agricultural	Private	East	Meek Rd	21	M-P	13.15



## **Appendix " . Study Area Roadway Inventory**



**Appendix A: Project Area Roadway Inventory**

Roadway	Washington County Functional Classification	City of Hillsboro Functional Classification	Posted Speed (mph)	On-Street Parking	Sidewalks	Bicycle Lanes	Paved Width (ft)
15th Ave	Collector	Collector	35	No	Yes	No	24-36
229th Ave	Collector	Collector	40	No	Yes	Yes	36
235th Ave	Collector	Collector	Basic Rule	No	Yes	No	24
25th Ave	Arterial	Arterial	45	No	No	No	24
Brookwood Parkway	Arterial	Arterial	55	No	Yes	No	60
Century Blvd	Collector	Collector	Basic Rule	No	Yes	Yes	36
Cornelius Pass Rd	Arterial	Arterial	45	No	Yes	Yes	60
Croeni Rd	Neighborhood Route	Local Street	Basic Rule	No	Yes	No	36
Dawson Creek Dr	Collector	Collector	Basic Rule	No	Yes	No	35
Dick Rd	Local Street	N/A	Basic Rule	No	No	No	22
Eggiman Rd / 273rd Ave	Local Street	N/A	25	No	No	No	23
Evergreen Parkway	Arterial	Arterial	45	No	Yes	Yes	75-90
Groveland Rd	Local Street	N/A	Basic Rule	No	No	No	22
Huffman St	Collector	Collector	Basic Rule	No	Yes	Yes	36
Jackson Quarry Rd	Local Street	N/A	Basic Rule	No	Yes	No	30
Jackson School Rd	Arterial	N/A	45	No	No	No	24-36
Jacobson Rd	Collector	Collector	40	No	Yes	Yes	36
Meek Rd	Collector	N/A	45	No	No	No	22
Meier-Jurgen Rd / 253rd Ave	Local Street	N/A	Basic Rule	No	No	No	18-24
Pubols Rd	Local Street	N/A	Basic Rule	No	No	No	22
Rock Creek Blvd	Collector	Collector	25	No	Yes	No	24-36
Schaaf Rd	Local Street	N/A	Private/None	No	No	No	24
Scotch Church Rd	Collector	N/A	45	No	No	No	24
Sewell Rd / 268th Ave	Local Street	N/A	25	No	No	No	20
Groveland Dr	Local Street	N/A	Basic Rule	No	No	No	22
Wagon Way	Neighborhood Route	Collector	35	No	Yes	No	36
West Union Rd	Arterial	Arterial	45	No	Yes	No	24

**Data Sources:**

**Note 1:** Functional classification data from:

Washington County: [http://www.co.washington.or.us/LUT/Divisions/LongRangePlanning/Publications/upload/TSP\\_10Maps.pdf](http://www.co.washington.or.us/LUT/Divisions/LongRangePlanning/Publications/upload/TSP_10Maps.pdf)

City of Hillsboro: [http://www.ci.hillsboro.or.us/Planning/documents/Transportation\\_System\\_Plan\\_Update.pdf](http://www.ci.hillsboro.or.us/Planning/documents/Transportation_System_Plan_Update.pdf)

**Note 2:** Posted speed data from Google maps, field observation and the following phone calls:

Washington County: Sarah Owens

City of Hillsboro: Brad Eckland

**Note 3:** On-street parking, sidewalks, bicycle lane and paved width data from: Google maps and field observation



## **Appendix C. Crash Evaluation**



Summary of Collision Types within the Brookwood IAMP Study Area (January 1, 2008 through December 31, 2010)

Study Location	Collision Type													Total	Severity		
	Rear End	Fixed Object	Angle	Other	Backing	Turning	Sideswipe-Opposite	Sideswipe-Meeting	Head On	Non-Collision	Parked	Bicycle	Pedestrian		Fatal Crashes	Injury Crashes	PDO Crashes
<b>Cornelius Pass Road - From West Union Road to Evergreen Parkway</b>	<b>27</b>	<b>2</b>	<b>5</b>	<b>0</b>	<b>0</b>	<b>14</b>	<b>8</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>57</b>	<b>0</b>	<b>17</b>	<b>40</b>
<i>West Union Road</i>	3	1	0	0	0	0	0	0	0	0	0	0	0	4	0	2	2
<i>Rock Creek Boulevard</i>	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
<i>Wagon Way</i>	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0
<i>Interchange</i>	16	1	0	0	0	8	7	0	0	0	0	0	1	33	0	8	25
<i>Imbrie Drive</i>	1	0	0	0	0	2	0	0	0	0	0	0	0	3	0	1	2
<i>Evergreen Parkway</i>	5	0	5	0	0	4	1	0	0	0	0	0	0	15	0	5	10
<b>Evergreen Parkway - From Cornelius Pass Rd to Jackson School Rd.</b>	<b>6</b>	<b>4</b>	<b>5</b>	<b>0</b>	<b>0</b>	<b>12</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>30</b>	<b>0</b>	<b>10</b>	<b>20</b>
<i>Jackson School Road</i>	3	1	0	0	0	4	0	0	0	0	0	0	0	8	0	3	5
<i>Brookwood Parkway</i>	2	1	0	0	0	0	1	1	0	0	0	0	0	5	0	3	2
<i>Atkeson Lane</i>	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	1
<i>Cornelius Pass Road</i>	1	2	5	0	0	7	0	0	0	0	0	0	1	16	0	4	12
<b>Brookwood Parkway / Helvetia Road - From West Union Road to Evergreen Parkway</b>	<b>19</b>	<b>3</b>	<b>6</b>	<b>0</b>	<b>0</b>	<b>7</b>	<b>1</b>	<b>2</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>39</b>	<b>2</b>	<b>9</b>	<b>28</b>
<i>Interchange</i>	8	2	0	0	0	2	0	0	0	1	0	0	0	13	0	4	9
<i>Huffman St</i>	0	0	0	0	0	1	0	1	0	0	0	0	0	2	1	0	1
<i>Evergreen Parkway</i>	11	1	6	0	0	4	1	1	0	0	0	0	0	24	1	5	18
<b>Jackson School Road - From West Union Road to Evergreen Parkway</b>	<b>9</b>	<b>5</b>	<b>9</b>	<b>0</b>	<b>0</b>	<b>15</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>39</b>	<b>0</b>	<b>10</b>	<b>29</b>
<i>West Union Road</i>	0	1	9	0	0	2	0	0	0	0	0	0	0	12	0	3	9
<i>Interchange</i>	8	3	0	0	0	13	0	0	0	0	0	0	0	24	0	7	17
<i>Evergreen Parkway</i>	1	1	0	0	0	0	0	1	0	0	0	0	0	3	0	0	3
<b>Jacobson Road - From Cornelius Pass Rd to Helvetia Road</b>	<b>2</b>	<b>0</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>6</b>	<b>0</b>	<b>2</b>	<b>4</b>
<i>Brookwood Parkway / Helvetia Road</i>	0	0	1	0	0	1	0	0	0	0	0	0	0	2	0	1	1
<i>Century Boulevard</i>	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0
<i>Croeni Road</i>	0	0	2	0	0	0	0	0	0	0	0	0	0	2	0	0	2
<i>Cornelius Pass Road</i>	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
<b>West Union Road - From Jackson School Road to Evergreen Parkway</b>	<b>0</b>	<b>1</b>	<b>5</b>	<b>0</b>	<b>1</b>	<b>4</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>11</b>	<b>0</b>	<b>7</b>	<b>4</b>
<i>Jackson School Road</i>	0	0	5	0	0	3	0	0	0	0	0	0	0	8	0	6	2
<i>Jackson Quarry Road</i>	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
<i>Groveland Road</i>	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	1
<i>Century Boulevard</i>	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	1	0
	<b>63</b>	<b>15</b>	<b>33</b>	<b>0</b>	<b>1</b>	<b>53</b>	<b>10</b>	<b>4</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>182</b>	<b>2</b>	<b>55</b>	<b>125</b>
	28%	7%	15%	0%	0%	24%	4%	2%	0%	0%	0%	0%	1%		1%	30%	69%
<b>US 26</b>	<b>23</b>	<b>9</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>8</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>42</b>	<b>2</b>	<b>15</b>	<b>25</b>
<i>Mainline: M.P. 58.00-63.00</i>	20	9	0	1	0	1	8	0	0	0	0	0	0	39	2	12	25
<i>Ramp &amp; Ramp Terminal</i>	3	0	0	0	0	0	0	0	0	0	0	0	0	3	0	3	0
<b>Total Study Area Crashes</b>	<b>86</b>	<b>24</b>	<b>33</b>	<b>1</b>	<b>1</b>	<b>54</b>	<b>18</b>	<b>4</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>224</b>	<b>4</b>	<b>70</b>	<b>150</b>
<b>% Crashes by Type</b>	38%	11%	15%	0%	0%	24%	8%	2%	0%	0%	0%	0%	1%		2%	38%	82%

Source: ODOT Crash Analysis and Reporting Unit, January 1, 2008 through December 31, 2010.

Note: Crashes listed in this table include all reported collisions within 265' of the listed facility along sidestreets.

OREGON DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION  
 TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT  
 CITY STREET LOCATIONS BY COUNTY - DRIVER BEHAVIOR FORMAT

Evergreen Road (Pkwy) from Cornelius Pass Rd to Jackson School Road plus 265 feet on all side streets and ramps  
 January 1, 2007 through December 31, 2010 \*\*2010 data is preliminary and subject to change

WASHINGTON COUNTY

SERIAL NO	DATE	TIME	DAY	*COUNTY OR CITY NAME	CRASH LOCATION	COLL TYPE	EVENT	CAUSE	ERROR	T O U R F	V E H I C L E T Y P / O W N # 1 # 2	P E O P L E				
												I	L	J	C	
04384	07/31/2007	9P	TU	Hillsboro	NW 229TH AVE 100 FT SW OF NW EVERGREEN PKY	HEAD		05,33,30	039,080,050	DRY	2 011 011	0	5	Y	Y	
06819	12/29/2009	5P	TU	Hillsboro	NW ATKESON LN AT NW EVERGREEN PKY	TURN		02	028	SNO	2 011 011	0	3	N	N	
01663	03/28/2008	12P	FR	Hillsboro	NW CORNELIUS PASS RD AT NW EVERGREEN PKY	ANGL		04	020	WET	2 011 011	0	0	N	N	
01834	04/01/2008	9P	TU	Hillsboro	NW CORNELIUS PASS RD AT NW EVERGREEN PKY	ANGL		04	020	DRY	2 011 011	0	0	N	N	
04801	09/27/2009	12P	SU	Hillsboro	NW CORNELIUS PASS RD AT NW EVERGREEN PKY	ANGL 110		04	020	DRY	1 011		0	1	N	N
00592	02/07/2010	12P	SU	Hillsboro	NW CORNELIUS PASS RD AT NW EVERGREEN PKY	ANGL		04	020	DRY	2 011 011	0	1	N	N	
05751	10/26/2010	9P	TU	Hillsboro	NW CORNELIUS PASS RD AT NW EVERGREEN PKY	ANGL 010		04	020	WET	2 011 011	0	1	N	N	
05615	10/15/2008	UNK	WE	Hillsboro	NW CORNELIUS PASS RD AT NW EVERGREEN PKY	REAR		07	026	DRY	2 999 011	0	0	N	N	
06948	06/26/2009	7A	FR	Hillsboro	NW CORNELIUS PASS RD AT NW EVERGREEN PKY	TURN		08	001,007,080	DRY	2 019 011	0	0	N	N	
04604	09/04/2010	11A	SA	Hillsboro	NW CORNELIUS PASS RD AT NW EVERGREEN PKY	TURN		02	004,028	DRY	2 011 011	0	0	N	N	
04622	09/05/2010	6A	SU	Hillsboro	NW CORNELIUS PASS RD AT NW EVERGREEN PKY	TURN		02	004,028	DRY	2 011 011	0	2	N	N	
04748	09/12/2010	10A	SU	Hillsboro	NW CORNELIUS PASS RD AT NW EVERGREEN PKY	TURN		04	097,097	DRY	2 011 011	0	2	N	N	
07071	12/18/2008	7P	TH	Hillsboro	NW EVERGREEN PKY 100 FT W OF NW CORNELIUS PASS RD	FIX	062,040,124	01	047,080	ICE	1 011		0	0	N	Y
02405	05/21/2009	1P	TH	Hillsboro	NW EVERGREEN PKY 160 FT W OF NW CORNELIUS PASS RD	TURN	040	02	004,028	DRY	2 011 019	0	0	N	N	
07110	12/24/2008	8A	WE	Hillsboro	NW EVERGREEN PKY 200 FT W OF NW CORNELIUS PASS RD	FIX	062,040,124	01	047,080	SNO	1 011		0	0	N	Y
02074	04/17/2008	6P	TH	Hillsboro	NW EVERGREEN PKY 500 FT W OF NW CORNELIUS PASS RD	TURN		02	004,028	DRY	2 011 011	0	2	N	N	
05982	11/03/2010	5P	WE	Hillsboro	NW EVERGREEN PKY 782 FT W OF NW CORNELIUS PASS RD	TURN		02	028	DRY	2 011 011	0	0	N	N	
04858	09/16/2010	11A	TH	Hillsboro	NW EVERGREEN PKY 880 FT W OF NW CORNELIUS PASS RD	PED		02	029	WET	1 011		0	1	N	N
06060	11/05/2010	3P	FR	Hillsboro	NW EVERGREEN RD AT NW JACKSON SCHOOL RD	REAR	013	07	026	DRY	3 011 011	0	1	N	N	
05518	10/07/2008	11P	TU	Hillsboro	NW EVERGREEN RD AT NW JACKSON SCHOOL RD	TURN		02	004,028	DRY	2 011 011	0	0	Y	N	
05579	10/13/2008	9A	MO	Hillsboro	NW EVERGREEN RD AT NW JACKSON SCHOOL RD	TURN		02	004,028	DRY	2 011 011	0	0	N	N	
00480	01/27/2010	2P	WE	Hillsboro	NW EVERGREEN RD AT NW JACKSON SCHOOL RD	TURN		04	020	DRY	2 011 011	0	1	N	N	
04826	09/15/2010	9A	WE	Hillsboro	NW EVERGREEN RD AT NW JACKSON SCHOOL RD	TURN		02	004,028	DRY	2 011 011	0	2	N	N	
04784	09/14/2010	6P	TU	Hillsboro	NW EVERGREEN RD 50 FT E OF NW JACKSON SCHOOL RD	REAR	013	07	026	DRY	3 011 011	0	1	N	N	
02028	04/27/2010	8A	TU	Hillsboro	NW EVERGREEN RD 100 FT E OF NW JACKSON SCHOOL RD	REAR		07	026	WET	2 011 011	0	0	N	N	
01036	03/05/2010	6A	FR	Hillsboro	NW EVERGREEN RD 100 FT E OF NW JACKSON SCHOOL RD	FIX	054,092	26	080	WET	1 011		0	0	N	N
02879	06/16/2009	4P	TU	Hillsboro	NW SHUTE RD 20 FT S OF NW EVERGREEN PKY	REAR		07	026	DRY	2 011 011	0	0	N	N	
00490	01/22/2008	3P	TU	Hillsboro	NW SHUTE RD 50 FT N OF NW EVERGREEN PKY	REAR	092	07,26	026	DRY	2 011 011	0	2	N	N	
02876	06/16/2009	3P	TU	Hillsboro	NW SHUTE RD 65 FT S OF NW EVERGREEN PKY	REAR	001	10	014,026	DRY	2 011 091	0	1	N	N	
00397	01/16/2008	5A	WE	Hillsboro	NW SHUTE RD 100 FT N OF NW EVERGREEN PKY	SS-M	124	01	047,080	ICE	2 011 011	0	2	N	Y	
00122	01/02/2009	8A	FR	Hillsboro	NW SHUTE RD 120 FT S OF NW EVERGREEN PKY	SS-O	124	01	047,080	ICE	3 011 011	0	1	N	Y	
00210	01/11/2009	8A	SU	Hillsboro	NW SHUTE RD 20 FT N OF NW EVERGREEN RD	REAR		07	026	DRY	2 011 999	0	0	N	N	
07019	12/17/2008	12P	WE	Hillsboro	NW SHUTE RD 25 FT N OF NW EVERGREEN RD	REAR		01	047,026	ICE	2 011 019	0	0	N	Y	
01980	04/26/2010	2P	MO	Hillsboro	NW SHUTE RD 60 FT N OF NW EVERGREEN RD	REAR		07	043,026	WET	2 011 091	0	1	N	N	
04005	07/28/2008	9A	MO	Hillsboro	NW SHUTE RD 100 FT N OF NW EVERGREEN RD	REAR		10	014,026	DRY	2 011 011	0	1	N	N	
02406	05/06/2008	8A	TU	Hillsboro	NW SHUTE RD 150 FT S OF NW EVERGREEN RD	FIX	062,040	10	080,081	DRY	1 011		0	1	N	N

OREGON DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION  
 TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT  
 STATE HIGHWAY SYSTEM CRASH LOCATIONS - DRIVER BEHAVIOR FORMAT

Helvetia Road/Shute Road from West Union Road to Evergreen Parkway plus 265 feet on all side streets  
 January 1, 2007 through December 31, 2010 \*\*2010 data is preliminary and subject to change

SERIAL NO	DATE	T I D M A E Y	*COUNTY OR CITY NAME	M C L O G M P T N Y T P	CRASH LOCATION	COLL TYPE	EVENT	CAUSE	ERROR	T O T S	--PEOPLE--					
											F H	VEHICLE TYP/OWN #1 #2	I I L J	A A N C	E E D D	
07447	12/06/2007	5P TH	*Washington	CN R HY	047, SUNSET AT MP 61.04	REAR		07	026	WET 2	011	011	0	1	N	N
04814	09/15/2010	4P WE	Hillsboro	CN R HY	047, SUNSET AT MP 61.04	REAR		07	026	WET 2	011	019	0	0	N	N
05422	10/11/2010	4P MO	Hillsboro	CN R HY	047, SUNSET AT MP 61.04	REAR 093		07,27	043,016,042	DRY 2	011	011	0	0	N	N
06958	11/13/2007	5P TU	Hillsboro	CN R HY	047, SUNSET AT MP 61.06	REAR 013		27,32	016,026,052	DRY 4	011	011	0	0	N	N
03611	07/08/2008	8A TU	Hillsboro	CN R HY	047, SUNSET AT MP 61.07	REAR		07	026	DRY 2	011	011	0	0	N	N
06294	11/13/2010	1A SA	Hillsboro	CN R HY	047, SUNSET AT MP 61.08	TURN 043,124		08,13	080,081,045,	WET 2	011	011	0	0	N	Y
03414	06/29/2008	8P SU	Hillsboro	CN R HY	047, SUNSET AT MP 61.08	FIX 043,092,040		26	080,081	WET 1	011		0	0	N	N
01161	03/09/2010	4P TU	Hillsboro	CN R HY	047, SUNSET AT MP 61.09	REAR		07	026	ICE 2	011	011	0	0	N	N
03986	07/30/2008	9A WE	Hillsboro	CN R HY	047, SUNSET AT MP 61.09	NCOL 124		01	047,080	DRY 1	091		0	1	N	Y
06449	11/24/2008	8A MO	Hillsboro	CN R HY	047, SUNSET AT MP 61.10	REAR 013		07	026	DRY 3	011	011	0	1	N	N
03327	07/07/2010	5P WE	Hillsboro	CN R HY	047, SUNSET AT MP 61.10	REAR		07	026	DRY 2	011	019	0	0	N	N
02777	05/20/2007	9A SU	Hillsboro	CN R HY	047, SUNSET AT MP 61.21	TURN		02	004,028	WET 2	011	011	0	0	N	N
04903	09/14/2008	2P SU	Hillsboro	CN R HY	047, SUNSET AT MP 61.22	REAR		27	016,026	DRY 2	011	011	0	1	N	N
00260	01/14/2009	5P WE	Hillsboro	CN R HY	047, SUNSET AT MP 61.22	REAR 013		07	026	DRY 4	011	011	0	3	N	N
01303	03/17/2009	11A TU	Hillsboro	CN R HY	047, SUNSET AT MP 61.22	TURN		14	003	WET 2	011	011	0	0	N	N
92754	05/23/2008	12P FR	Hillsboro	CN R HY	047, SUNSET AT MP 61.22	FIX 047		01,08	047,001	WET 1	011		0	1	N	Y
04568	08/09/2007	4P TH	Hillsboro	CN R HY	047, SUNSET AT MP 61.49	REAR		07	026	DRY 2	011	011	0	0	N	N
00758	02/04/2007	8P SU	Hillsboro	CN R HY	047, SUNSET AT MP 61.50	REAR		07	026	DRY 2	011	011	0	1	N	N

OREGON DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION  
 TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT  
 CITY STREET LOCATIONS BY COUNTY - DRIVER BEHAVIOR FORMAT

Helvetia Road/Shute Road from West Union Road to Evergreen Parkway plus 265 feet on all side streets  
 January 1, 2007 through December 31, 2010 \*\*2010 data is preliminary and subject to change

WASHINGTON COUNTY

SERIAL	NO	DATE	TIME	DAY	*COUNTY OR CITY NAME	CRASH LOCATION	COLL TYPE EVENT	CAUSE	ERROR	T O S U R F	V E H I C L E TYP/OWN	PEOPLE				
												#1	#2	L	J	K I A E N L E C D
03830	07/05/2007	12A	TH	Hillsboro	NW EVERGREEN PKY AT NW SHUTE RD	ANGL	04	020	DRY	2	011	011	0	0	N	N
00317	01/20/2010	8A	WE	Hillsboro	NW EVERGREEN PKY AT NW SHUTE RD	ANGL	04,02	024,020	WET	2	011	013	0	3	N	N
01238	03/15/2010	9A	MO	Hillsboro	NW EVERGREEN PKY AT NW SHUTE RD	ANGL	04	020	DRY	2	011	011	0	2	N	N
03247	07/03/2010	8P	SA	Hillsboro	NW EVERGREEN PKY AT NW SHUTE RD	ANGL	04	020	DRY	2	011	011	0	0	N	N
05458	10/14/2010	4P	TH	Hillsboro	NW EVERGREEN PKY AT NW SHUTE RD	ANGL 055	04	020	DRY	2	011	011	0	1	N	N
00106	01/03/2008	6P	TH	Hillsboro	NW EVERGREEN PKY AT NW SHUTE RD	TURN 092	07,26	026	WET	2	011	011	0	0	N	N
04517	08/23/2008	8P	SA	Hillsboro	NW EVERGREEN RD AT NW SHUTE RD	ANGL 013	04	020	DRY	3	011	011	0	1	N	N
01739	04/14/2010	8A	WE	Hillsboro	NW EVERGREEN RD AT NW SHUTE RD	ANGL	04	020	DRY	2	011	011	0	1	N	N
00748	02/05/2008	6A	TU	Hillsboro	NW EVERGREEN RD AT NW SHUTE RD	REAR	10	014,026	WET	2	011	019	0	0	N	N
06227	11/15/2008	4A	SA	Hillsboro	NW EVERGREEN RD AT NW SHUTE RD	REAR	32	052,026	DRY	2	011	011	0	2	N	N
02018	05/01/2009	2P	FR	Hillsboro	NW EVERGREEN RD AT NW SHUTE RD	REAR 013	32	052,026	DRY	3	011	011	0	2	N	N
02638	06/01/2009	11A	MO	Hillsboro	NW EVERGREEN RD AT NW SHUTE RD	REAR	07	026	DRY	2	011	991	0	0	N	N
05135	09/24/2008	8P	WE	Hillsboro	NW EVERGREEN RD AT NW SHUTE RD	TURN	02	028	DRY	2	011	011	0	0	N	N
06608	11/27/2010	5P	SA	Hillsboro	NW EVERGREEN RD AT NW SHUTE RD	TURN	04	020	WET	2	011	011	0	2	N	N
03209	06/17/2008	6A	TU	Hillsboro	NW HUFFMAN ST AT NW SHUTE RD	SS-M 087,092	01,26,07	026,026,047,	DRY	4	011	011	0	4	N	Y
03688	07/25/2010	4P	SU	Hillsboro	NW HUFFMAN ST AT NW SHUTE RD	TURN	02	004,028	DRY	2	011	011	0	2	N	N
00490	01/22/2008	3P	TU	Hillsboro	NW SHUTE RD 50 FT N OF NW EVERGREEN PKY	REAR 092	07,26	026	DRY	2	011	011	0	2	N	N
00397	01/16/2008	5A	WE	Hillsboro	NW SHUTE RD 100 FT N OF NW EVERGREEN PKY	SS-M 124	01	047,080	ICE	2	011	011	0	2	N	Y
01061	03/02/2010	6P	TU	Hillsboro	NW SHUTE RD 500 FT N OF NW EVERGREEN PKY	REAR	07	026	WET	2	011	011	0	0	N	N
03351	06/15/2007	2P	FR	Hillsboro	NW SHUTE RD 1000 FT N OF NW EVERGREEN PKY	TURN	02	004,028	DRY	2	011	011	0	0	N	N
00869	02/11/2008	11A	MO	Hillsboro	NW SHUTE RD UNK FT N OF NW EVERGREEN RD	REAR	07	026	DRY	2	011	011	0	0	N	N
00210	01/11/2009	8A	SU	Hillsboro	NW SHUTE RD 20 FT N OF NW EVERGREEN RD	REAR	07	026	DRY	2	011	999	0	0	N	N
07019	12/17/2008	12P	WE	Hillsboro	NW SHUTE RD 25 FT N OF NW EVERGREEN RD	REAR	01	047,026	ICE	2	011	019	0	0	N	Y
01980	04/26/2010	2P	MO	Hillsboro	NW SHUTE RD 60 FT N OF NW EVERGREEN RD	REAR	07	043,026	WET	2	011	091	0	1	N	N
04005	07/28/2008	9A	MO	Hillsboro	NW SHUTE RD 100 FT N OF NW EVERGREEN RD	REAR	10	014,026	DRY	2	011	011	0	1	N	N
05123	09/29/2010	8A	WE	Hillsboro	NW SHUTE RD 292 FT N OF NW EVERGREEN RD	FIX 058,062	16	080,081	DRY	1	011		0	0	N	N
01245	03/15/2010	3P	MO	Hillsboro	NW SHUTE RD 500 FT N OF NW EVERGREEN RD	SS-O	07	043,042	DRY	2	011	011	0	0	N	N
03597	07/16/2010	6P	FR	Hillsboro	NW SHUTE RD 1000 FT N OF NW EVERGREEN RD	TURN	02	004,028	DRY	2	011	014	0	2	N	N

VEHICLE OWNERSHIP CODES

Code	Short Description	Long Description
1	PRVTE	Private
2	GOVMT	Government
3	PUBLIC	Public
4	RENTL	Rental vehicle
5	STOLN	Stolen vehicle
9	UNKN	Unknown ownership

## VEHICLE TYPE CODES

Code	Short Description	Long Description
01	PSNGR CAR	Passenger car, pickup, etc.
02	BOBTAIL	Truck tractor with no trailers (bobtail)
03	FARM TRCTR	Farm tractor or self-propelled farm equipment
04	SEMI TOW	Truck Tractor with trailer/mobile home in tow
05	TRUCK	Truck with non-detachable bed, panel, etc.
06	MOPED	Moped, minibike, motor scooter, or motor bicycle
07	SCHL BUS	School bus (includes van)
08	OTH BUS	Other bus
09	MTRCYCLE	Motorcycle
10	OTHER	Other: forklift, backhoe, etc.
11	MOTRHOME	Motorhome
12	TROLLEY	Motorized Street Car/Trolley (no rails/wires)
13	ATV	ATV
14	MTRSCTR	Motorized scooter
15	SNOWMOBILE	Snowmobile
99	UNKNOWN	Unknown vehicle type

## CAUSE CODES

Code	Short Description	Medium Description	Long Description
00	NO CODE	NO CODE APPLICABLE	No cause associated at this level
01	TOO-FAST	TOO FAST FOR COND	Too fast for conditions (not exceed posted speed)
02	NO-YIELD	FAILED YIELD ROW	Did not yield right-of-way
03	PAS-STOP	PASSED STOP SIGN	Passed stop sign or red flasher
04	DIS--RAG	DISREGARD R-A-G	Disregarded R-A-G traffic signal.
05	LEFT-CTR	DROVE WRONG SIDE	Drove left of center on two-way road
06	IMP-OVER	IMPROPER PASSING	Improper overtaking
07	TOO-CLOS	FOLLOW TOO CLOSE	Followed too closely
08	IMP-TURN	IMPROPER TURN	Made improper turn
09	DRINKING	ALC OR DRUGS	Alcohol or Drug Involved
10	OTHR-IMP	OTHER DRIVE ERR	Other improper driving
11	MECH-DEF	MECH DEFECT	Mechanical defect
12	OTHER	OTHER	Other (not improper driving)
13	IMP LN C	IMP LANE CHANGE	Improper change of traffic lanes
14	DIS TCD	DISRG OTHR TCD	Disregarded other traffic control device
15	WRNG WAY	WRONG WAY/1 WAY	Wrong way on one-way roadway
16	FATIGUE	DRIVER FATIGUED	Driver drowsy/fatigued/sleepy
18	IN RDWY	ILLEGALLY IN RDWY	Non-motorist illegally in roadway
19	NT VISBL	NOT VISIBLE	Non-motorist clothing not visible
20	IMP PKNG	IMPROPER PARKING	Vehicle improperly parked
21	DEF STER	DEFECTIVE STEERING	Defective steering mechanism
22	DEF BRKE	DEFECTIVE BRAKES	Inadequate or no brakes
24	LOADSHFT	LOAD SHIFTED	Vehicle lost load or load shifted
25	TIREFAIL	TIRE FAILURE	Tire Failure
26	PHANTOM	PHANTOM VEHICLE	Phantom / Non-contact Vehicle
27	INATTENT	INATTENTION	Inattention
30	SPEED	EXCED POSTED SPEED	Driving in excess of posted speed
31	RACING	SPEED RACING	Speed Racing (per PAR)
32	CARELESS	CARELESS DRIVING	Careless Driving (citation issued)
33	RECKLESS	RECKLESS DRIVING	Reckless Driving (citation issued)
34	AGGRESV	AGGRESSIVE DRIVING	Aggressive Driving (per PAR)
35	RD RAGE	ROAD RAGE	Road Rage (per PAR)

## ERR CODES

Code	Short Description	Medium Description	Long Description
000	NONE	NO ERROR	No error
001	WIDE TRN	WIDE TURN	Wide turn
002	CUT CORN	CUT CORNER	Cut corner on turn
003	FAIL TRN	F OBEY TRN	Failed to obey mandatory traffic turn signal, sign or lane markings
004	L IN TRF	LTRN FNT TRAF	Left turn in front of oncoming traffic
005	L PROHIB	LTRN PROHIB	Left turn where prohibited
006	FRM WRNG	T FRM WRNG LN	Turned from wrong lane
007	TO WRONG	T TO WRONG LN	Turned into wrong lane
008	ILLEG U	ILLEG U-TURN	U-turned illegally
009	IMP STOP	IMP STOP	Improperly stopped in traffic lane
010	IMP SIG	IMP/FAIL SIG	Improper signal or failure to signal
011	IMP BACK	IMP BACKING	Backing improperly (Not parking)
012	IMP PARK	IMP PARKED	Improperly parked
013	UNPARK	IMP STRT PARK	Improper start leaving parked position
014	IMP STRT	IMP STRT STOP	Improper start from stopped position
015	IMP LGHT	IMP/NO LIGHTS	Improper or no lights (vehicle in traffic)
016	INATTENT	INATTENTION	Failed to dim lights (until 4/1/97) / Inattention (after 4/1/97)
017	UNSF VEH	DR UNSAFE VEH	Driving unsafe vehicle (no other error apparent)
018	OTH PARK	PRK MAN N/CLR	Entering, exiting parked position with insufficient clearance or other improper parking maneuver
019	DIS DRIV	DISRG DR SIG	Disregarded other driver's signal
020	DIS SGNL	DISRG TRF SIG	Disregarded traffic signal
021	RAN STOP	DISRG STP SGN	Disregarded stop sign or flashing red
022	DIS SIGN	DISRG WRN SGN	Disregarded warning sign, flares or flashing amber
023	DIS OFCR	DISRG POL/FLG	Disregarded police officer or flagman
024	DIS EMER	DISRG SIR/EMR	Disregarded siren or warning of emergency vehicle
025	DIS RR	DISRG RR SIG	Disregarded RR signal, RR sign, or RR flagman
026	REAR-END	F AVOID STP V	Failed to avoid stopped or parked vehicle ahead other than school bus
027	BIKE ROW	F/YLD ROW BIK	Did not have right-of-way over pedalcyclist
028	NO ROW	NO R-O-W	Did not have right-of-way
029	PED ROW	F/YLD ROW PED	Failed to yield right-of-way to pedestrian
030	PAS CURV	PASS ON CURVE	Passing on a curve
031	PAS WRNG	PASS WRNG SID	Passing on the wrong side
032	PAS TANG	PASS TANGENT	Passing on straight road under unsafe conditions
033	PAS X-WK	PASS STP4PED	Passed vehicle stopped at crosswalk for pedestrian
034	PAS INTR	PASS AT INTER	Passing at intersection
035	PAS HILL	PASS ON HILL	Passing on crest of hill
036	N/PAS ZN	PASS N/PASSNG	Passing in "No Passing" zone
037	PAS TRAF	PASS ONC TRAF	Passing in front of oncoming traffic
038	CUT-IN	CUTTING IN	Cutting in (two lanes - two way only)
039	WRNGSIDE	DR WRONG SIDE	Driving on wrong side of the road
040	THRU MED	DR THRU MEDN	Driving through safety zone or over island
041	F/ST BUS	F/STP SCHLBUS	Failed to stop for school bus
042	F/SLO MV	F/SLO SLO VEH	Failed to decrease speed for slower moving vehicle
043	TO CLOSE	FOLLW TO CLOS	Following too closely (Must be on Officer's Report)
044	STRDL LN	STRD/DR WRNG	Straddling or driving on wrong lanes
045	IMP CHG	IMP LANE CHG	Improper change of traffic lanes

## ERR CODES

Code	Short Description	Medium Description	Long Description
046	WRNG WAY	WRNG WY/1 WAY	Wrong way on one-way roadway (Vehicle is deliberately traveling on wrong side)
047	BASCRULE	V BASIC RULE	Driving too fast for conditions (Not exceeding posted speed)
048	OPN DOOR	OPN DOOR TRAF	Opened door into adjacent traffic lane
049	IMPEDING	IMPEDING TRAF	Impeding Traffic
050	SPEED	SPEED	Driving in excess of posted speed
051	RECKLESS	RECKLSS DRVNG	Reckless driving (per PAR)
052	CARELESS	CARELSS DRVNG	Careless driving (per PAR)
053	RACING	RACING	Speed Racing (per PAR)
054	X N/SGNL	X-INT NO SGNL	Crossing at intersection – no traffic signal present
055	X W/SGNL	X-INT W/ SGNL	Crossing at intersection – traffic signal present
056	DIAGONAL	X-INT DIAGNL	Crossing at intersection - diagonally
057	BTWN INT	X-BTWN INTER	Crossing between intersections
059	W/TRAF-S	W SHLD W/TRAF	Walking, running, riding, etc., on shoulder WITH traffic
060	A/TRAF-S	W SHLD A/TRAF	Walking, running, riding, etc., on shoulder FACING traffic
061	W/TRAF-P	W PAVE W/TRAF	Walking, running, riding, etc., on pavement WITH traffic
062	A/TRAF-P	W PAVE A/TRAF	Walking, running, riding, etc., on pavement FACING traffic
063	PLAYINRD	PLAY IN RDWY	Playing in street or road
064	PUSH MV	PUSH MV IN RD	Pushing or working on vehicle in road or on shoulder
065	WK IN RD	WORK IN RD	Working in roadway or along shoulder
070	LAYON RD	LYING IN RD	Standing or lying in roadway
073	DIS POL	DISRG POL/FLG	Disregarding Police (eluding)
080	FAIL LN	F MAINT LANE	Failed to maintain lane
081	OFF RD	RAN OFF RD	Ran off road
082	NO CLEAR	MISJUDGE CLR	Driver misjudged clearance
083	OVRSTEER	OVERSTEER	Over Correcting
084	NOT USED	NOT USED	Code not in use
085	OVRLOAD	OVERLOAD	Overloading or improper loading of vehicle with cargo or passengers
097	UNA DIS TC	UNA DISRG TCD	Unable to determine which driver disregarded traffic control device

## EVENT CODES

Code	Short Description	Medium Description	Long Description
001	FEL/JUMP	FELL/JUMPED MV	Occupant fell, jumped or was ejected from moving vehicle
002	INTERFER	PSNGR INTERFERED	Passenger interfered with driver
003	BUG INTF	ANML INTERFERED	Animal or insect in vehicle interfered with driver
004	PED INV	PED INVOLVED	Pedestrian involved (Non-pedestrian accident)
005	SUB-PED	SUBSEQUENT PED	"Sub-Ped": pedestrian injured subsequent to collision, etc.
006	BIKE INV	PEDALCYCLE INV	Tricycle-Bicycle involved
007	HITCHIKR	HITCHHIKER	Hitchhiker (soliciting a ride)
008	PSNGR TOW	PSNGR TOWED	Passenger being towed or pushed on conveyance
009	ON/OFF V	ON/OFF STOP VEH	Getting on or off stopped or parked vehicle (occupants only)
010	SUB OTRN	SUBSEQ OVERTURN	Overtuned after first harmful event
011	MV PUSHD	VEH BEING PUSHED	Vehicle being pushed
012	MV TOWED	VEH TOWED/TOWING	Vehicle towed or had been towing another vehicle
013	FORCED	FORCED BY IMPACT	Vehicle forced by impact into another vehicle, pedalcyclist or pedestrian
014	SET MOTN	MV SET IN MOTION	Vehicle set in motion by non-driver (child released brakes, etc.)
015	RR ROW	RAILROAD ROW	At or on railroad right-of-way (not Light Rail)
016	LT RL ROW	LIGHT RAIL ROW	At or on Light-Rail right-of-way
017	RR HIT V	TRAIN HIT VEH	Train struck vehicle
018	V HIT RR	VEH HIT TRAIN	Vehicle struck train
019	HIT RR CAR	VEH HIT RR CAR	Vehicle struck railroad car on roadway
020	JACKKNIFE	JACKKNIFE	Jackknife; trailer or towed vehicle struck towing vehicle
021	TRL OTRN	TRAILER O'TURN	Trailer or towed vehicle overturned
022	CN BROKE	TRLR CONN BROKE	Trailer connection broke
023	DETACH TRL	DETCHD TRLR STRKNG	Detached trailing object struck other vehicle, non-motorist, or object
024	V DOOR OPN	V DOOR OPN IN TRAF	Vehicle door opened into adjacent traffic lane
025	WHEELOFF	WHEEL CAME OFF	Wheel came off
026	HOOD UP	HOOD FLEW UP	Hood flew up
028	LOAD SHIFT	LOAD SHIFTED	Lost load, load moved or shifted
029	TIREFAIL	TIRE FAILURE	Tire Failure
030	PET	PET	Pet: cat, dog and similar
031	LVSTOCK	LIVESTOCK	Stock: cow, calf, bull, steer, sheep, etc.
032	HORSE	HORSE	Horse, mule, or donkey
033	HRSE&RID	HORSE & RIDER	Horse and rider
034	GAME	GAME NO DEER/ELK	Wild animal, game (includes birds; not deer or elk)
035	DEER ELK	DEER OR ELK	Deer or elk, wapiti
036	ANML VEH	ANIMAL-DRAWN VEH	Animal-drawn vehicle
037	CULVERT	CULVERT/MANHOLE	Culvert, open low or high manhole
038	ATENUATN	IMPACT CUSHION	Impact attenuator
039	PK METER	PARKING METER	Parking meter
040	CURB	CURB	Curb (also narrow sidewalks on bridges)
041	JIGGLE	JIGGLE BAR N/MED	Jiggle bars or traffic snake for channelization

## EVENT CODES

Code	Short Description	Medium Description	Long Description
042	GDRL END	GUARDRAIL END	Leading edge of guardrail
043	GARDRAIL	GUARDRAIL	Guard rail (not metal median barrier)
044	BARRIER	MEDIAN BARRIER	Median barrier (raised or metal)
045	WALL	WALL	Retaining wall or tunnel wall
046	BR RAIL	BRIDGE RAIL	Bridge railing (on bridge and approach)
047	BR ABUT	BRIDGE ABUTMENT	Bridge abutment (approach ends)
048	BR COLMN	BRIDGE COLUMN	Bridge pillar or column (even though struck protective guard rail first)
049	BR GIRDR	BRIDGE GIRDER	Bridge girder (horizontal structure overhead)
050	ISLAND	TRAFFIC ISLAND	Traffic raised island
051	GORE	GORE	Gore
052	POLE UNK	POLE-UNKNOWN	Pole – type unknown
053	POLE UTL	POLE-UTILITY	Pole – power or telephone
054	ST LIGHT	POLE-ST LIGHT	Pole – street light only
055	TRF SGNL	POLE-TRAF SIGNAL	Pole – traffic signal and ped signal only
056	SGN BRDG	POLE-SIGN BRIDGE	Pole – sign bridge
057	STOPSIGN	STOP/YIELD SIGN	Stop or yield sign
058	OTH SIGN	OTHER SIGN	Other sign, including street signs
059	HYDRANT	HYDRANT	Hydrant
060	MARKER	DELINEATOR	Delineator or marker (reflector posts)
061	MAILBOX	MAILBOX	Mailbox
062	TREE	TREE/STUMP	Tree, stump or shrubs
063	VEG OHED	VEGTN OVER RDWY	Tree branch or other vegetation overhead, etc.
064	WIRE/CBL	CABLE ACROSS RD	Wire or cable across or over the road
065	TEMP SGN	TEMP SIGN/BARR	Temporary sign or barricade in road, etc.
066	PERM SGN	PERM SIGN/BARR	Permanent sign or barricade in/off road
067	SLIDE	SLIDE/ROCKS	Slides, rocks off or on road, falling rocks
068	FRGN OBJ	FOREIGN OBJECT	Foreign obstruction/debris in road (not gravel)
069	EQP WORK	EQUIP WORKING	Equipment working in/off road
070	OTH EQP	OTHER EQUIPMENT	Other equipment in or off road (includes parked trailer, boat)
071	MAIN EQP	MAINTNCE EQUIP	Wrecker, street sweeper, snow plow or sanding equipment
072	OTHER WALL	OTHER WALL	Rock, brick or other solid wall
073	IRRGL PVMT	IRREGULAR PAVEMENT	Speed bump, other bump, pothole or pavement irregularity (per PAR)
075	CAVE IN	CAVE IN	Bridge or road cave in
076	HI WATER	HIGH WATER	High Water
077	SNO BANK	SNOW BANK	Snow Bank
078	HOLE	HOLE/RDWY EDGE	Chuckhole in road, low or high shoulder at pavement edge
079	DITCH	CUT SLOPE/DITCH	Cut slope or ditch embankment
080	OBJ F MV	OBJ FRM OTHR VEH	Struck by rock or other object set in motion by other vehicle (incl. lost loads)
081	FLY-OBJ	OTHER MOVING OBJ	Struck by other moving or flying object
082	VEH HID	VEH OBSCURE VIEW	Vehicle obscured view
083	VEG HID	VEG OBSCURE VIEW	Vegetation obscured view
084	BLDG HID	BLD OBSCURE VIEW	View obscured by fence, sign, phone booth, etc.

## EVENT CODES

Code	Short Description	Medium Description	Long Description
085	WIND GUST	WIND GUST	Wind Gust
086	IMMERSED	IMMERSION	Vehicle immersed in body of water
087	FIRE/EXP	FIRE/EXPLOSION	Fire or Explosion
088	FENC/BLD	FENCE/BUILDING	Fence or building, etc.
089	OTH ACDT	REFER OTHER ACDT	Accident related to another separate accident
090	TO 1 SIDE	TWO WAY ONE SIDE	Two-way traffic on divided roadway all routed to one side
092	PHANTOM	PHANTOM VEH	Other (phantom) non-contact vehicle (on PAR or report)
093	CELL-POL	CELLPHONE-POLICE	Cell phone (on PAR or driver in use)
094	VIOL GDL	VIOL GRAD DR LIC	Teenage driver in violation of graduated license pgm
095	GUY WIRE	GUY WIRE	Guy wire
096	BERM	BERM	Berm (earthen or gravel mound)
097	GRAVEL	GRAVEL IN RDWY	Gravel in roadway
098	ABR EDGE	ABRUPT EDGE	Abrupt edge
099	CELL-WTN	CELLPHONE-WITNSS	Cell Phone use witnessed by other participant
100	UNK FIXD	UNK FIX OBJ	Unknown type of fixed object
101	OTHER OBJ	OTHER OBJ NOT FIXED	Other or unknown object, not fixed
104	OUTSIDE V	PSGR OUTSIDE VEHICLE	Passenger riding on vehicle exterior
105	PEDAL PSGR	PSNGR ON PEDALCYCLE	Passenger riding on pedalcycle
106	MAN WHLCHR	NONMOTOR WHEELCHAIR	Pedestrian in non-motorized wheelchair
107	MTR WHLCHR	MOTORIZED WHEELCHAIR	Pedestrian in motorized wheelchair
110	N-MTR	NM STR VEH	Non-motorist struck vehicle
111	S CAR VS V	ST CAR STRUCK VEH	Street Car/Trolley (on rails and/or overhead wire system) struck vehicle
112	V VS S CAR	VEH STRUCK ST CAR	Vehicle struck Street Car/Trolley (on rails and/or overhead wire system)
113	S CAR ROW	STREET CAR ROW	At or on Street Car/Trolley right-of-way
114	RR EQUIP	VEH STRUCK RR EQUIP	Vehicle struck railroad equipment (not train) on tracks
120	WIRE BAR	WIRE BARRIER	Wire or cable median barrier
124	SLIPPERY	SLIPPERY SURFACE	Sliding or swerving due to wet, icy, slippery or loose surface
125	SHLDR	SHLDR GAVE	Shoulder gave way

OREGON DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION  
TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT  
STATE HIGHWAY SYSTEM CRASH LOCATIONS - DRIVER BEHAVIOR FORMAT

Jackson School Road from Evergreen Road (Pkwy) to West Union Road plus 265 feet on all side streets and ramps  
January 1, 2007 through December 31, 2010 \*\*2010 data is preliminary and subject to change

SERIAL NO	DATE	T I D M A Y	*COUNTY OR CITY NAME	M C O M P N T	CRASH LOCATION	COLL TYPE	EVENT	CAUSE	ERROR	WET DRY	VEHICLE		I I		A A		E E		
											#1	#2	L	J	C	D	L	N	L
00886	02/11/2007	1A SU	*Washington	CN R HY	047, SUNSET AT MP 58.08	FIX	043	01,08	047,001,081	WET	1	011		0	0	Y	Y		
05204	10/15/2009	1P TH	*Washington	CN R HY	047, SUNSET AT MP 58.23	TURN		08,02	006,028	DRY	2	011	011	0	1	N	N		
07073	12/18/2008	8A TH	*Washington	CN R HY	047, SUNSET AT MP 58.28	REAR		01	047,026	ICE	2	011	011	0	2	N	Y		
02512	05/22/2010	3P SA	*Washington	CN R HY	047, SUNSET AT MP 58.29	REAR		01	047,042	WET	2	011	011	0	2	N	Y		
01513	03/19/2007	4P MO	*Washington	CN R HY	047, SUNSET AT MP 58.29	TURN		02	028	DRY	2	011	011	0	1	N	N		
00802	02/09/2008	2P SA	*Washington	CN R HY	047, SUNSET AT MP 58.29	TURN		02	028	DRY	2	011	011	0	1	N	N		
03798	07/28/2010	8A WE	*Washington	CN R HY	047, SUNSET AT MP 58.29	TURN		02	028	DRY	2	011	011	0	4	N	N		
03223	06/19/2008	2A TH	*Washington	CN R HY	047, SUNSET AT MP 58.29	FIX	079	30,33,03	050,051,021	DRY	1	011			0	2	Y	Y	
04958	10/05/2009	2P MO	*Washington	CN R HY	047, SUNSET AT MP 58.29	REAR		07	026	DRY	2	011	011	0	3	N	N		
00237	01/14/2010	10A TH	*Washington	CN R HY	047, SUNSET AT MP 58.36	FIX	029,070	25	080,081	DRY	1	011			0	0	N	N	
01665	03/28/2008	10P FR	*Washington	CN R HY	047, SUNSET AT MP 58.68	REAR		06	031	DRY	2	011	011	0	0	N	N		
01403	03/13/2008	7A TH	*Washington	CN R HY	047, SUNSET AT MP 58.70	TURN		02	004,028	WET	2	011	011	0	1	N	N		
02819	06/13/2009	10A SA	*Washington	CN R HY	047, SUNSET AT MP 58.70	TURN		02	004,028	DRY	2	011	011	0	0	N	N		
04681	09/19/2009	5P SA	*Washington	CN R HY	047, SUNSET AT MP 58.70	TURN		07	028	DRY	2	011	011	0	1	N	N		
02047	04/29/2010	9A TH	*Washington	CN R HY	047, SUNSET AT MP 58.70	TURN		02	004,028	DRY	2	011	011	0	1	N	N		
00966	02/19/2008	5P TU	*Washington	CN R HY	047, SUNSET AT MP 58.73	REAR	092,013	27,26	016,026	DRY	3	011	011	0	0	N	N		
03953	08/14/2009	3P FR	*Washington	CN R HY	047, SUNSET AT MP 58.75	REAR		07	026	DRY	2	011	011	0	2	N	N		
07123	12/17/2010	3P FR	*Washington	CN R HY	047, SUNSET AT MP 58.76	FIX	079,088	01	047	DRY	1	011			0	0	N	Y	
02582	05/08/2007	1P TU	*Washington	CN R HY	047, SUNSET AT MP 58.81	TURN		02	004,028	DRY	2	011	011	0	2	N	N		
04578	08/10/2007	3P FR	*Washington	CN R HY	047, SUNSET AT MP 58.81	TURN	012	02	028	DRY	2	011	011	0	0	N	N		
02033	05/02/2009	12P SA	*Washington	CN R HY	047, SUNSET AT MP 58.81	TURN		02	028	DRY	2	011	011	0	2	N	N		
03668	07/29/2009	7A WE	*Washington	CN R HY	047, SUNSET AT MP 58.81	TURN		02	004,028	DRY	2	011	011	0	1	N	N		
01159	03/09/2010	7A TU	*Washington	CN R HY	047, SUNSET AT MP 58.81	TURN	079	02	028	WET	2	999	011	0	0	N	N		
03121	06/29/2010	3P TU	*Washington	CN R HY	047, SUNSET AT MP 58.81	TURN		08	008	DRY	2	011	011	0	1	N	N		
02253	04/26/2008	3P SA	*Washington	CN R HY	047, SUNSET AT MP 59.30	REAR		01	047,026	DRY	2	011	011	0	0	N	Y		
03110	06/01/2007	2P FR	*Washington	CN R HY	047, SUNSET AT MP 59.31	REAR		07	026	DRY	2	011	011	0	0	N	N		
01537	04/02/2009	12P TH	*Washington	CN R HY	047, SUNSET AT MP 59.31	REAR	013	07	026	DRY	3	011	999	0	0	N	N		
04765	09/05/2008	4P FR	*Washington	CN R HY	047, SUNSET AT MP 59.31	TURN		07	026	DRY	2	011	011	0	0	N	N		
04821	09/28/2009	5P MO	*Washington	CN R HY	047, SUNSET AT MP 59.31	TURN		07	026	DRY	2	011	011	0	0	N	N		

OREGON DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION  
 TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT  
 MULTNOMAH / WASHINGTON COUNTY ROAD CRASH LOCATIONS - DRIVER BEHAVIOR FORMAT

Jackson School Road from Evergreen Road (Pkwy) to West Union Road plus 265 feet on all side streets and ramps  
 January 1, 2007 through December 31, 2010 \*\*2010 data is preliminary and subject to change

SERIAL NO	DATE	TIME	DAY	*COUNTY OR CITY NAME	CRASH LOCATION	COLL TYPE	EVENT	CAUSE	ERROR	R E F	T O S U V				PEOPLE K I A E L N L E J C				
											VEHICLE TYP/OWN #1	#2	L	I	A	E	L	N	L
00801	02/08/2007	6P	TH	*Washington	JACKSON SCHOOL RD 50/100ths MI N OF EVERGREEN RD	TURN		02	028	WET	2	011	011	0	1	N	N	N	N
08014	12/25/2007	5P	TU	*Washington	NW JACKSON SCHOOL RD 19/100ths MI N OF NE EVERGREEN RD	FIX	079,010,124	01	047,080	ICE	1	011		0	2	N	Y		
05922	11/17/2009	1A	TU	*Washington	NW JACKSON SCHOOL RD 50/100ths MI N OF NE EVERGREEN RD	FIX	092,043	26	080	WET	1	011		0	3	N	N	N	
06810	12/29/2009	3P	TU	*Washington	NW JACKSON SCHOOL RD 100/100ths MI N OF NE EVERGREEN RD	SS-M		05	044	SNO	2	011	011	0	0	N	N	N	
00051	01/03/2007	7P	WE	*Washington	NW JACKSON SCHOOL RD AT NW WEST UNION RD	ANGL	013	02	028	DRY	3	011	011	0	2	N	N	N	
00981	02/16/2007	2P	FR	*Washington	NW JACKSON SCHOOL RD AT NW WEST UNION RD	ANGL	057,052,100	02	028	WET	2	011	011	0	1	N	N	N	
02924	05/23/2007	12P	WE	*Washington	NW JACKSON SCHOOL RD AT NW WEST UNION RD	ANGL		02	028	DRY	2	011	011	0	1	N	N	N	
03694	06/29/2007	8A	FR	*Washington	NW JACKSON SCHOOL RD AT NW WEST UNION RD	ANGL	057,028	02	028	WET	2	011	011	0	0	N	N	N	
03299	06/25/2008	11P	WE	*Washington	NW JACKSON SCHOOL RD AT NW WEST UNION RD	ANGL		03	021	DRY	2	011	011	0	2	N	N	N	
06868	12/15/2008	4P	MO	*Washington	NW JACKSON SCHOOL RD AT NW WEST UNION RD	ANGL		02	028	ICE	2	011	011	0	0	N	N	N	
01990	05/27/2009	10A	WE	*Washington	NW JACKSON SCHOOL RD AT NW WEST UNION RD	ANGL		02	028	DRY	2	011	011	0	1	N	N	N	
02593	06/02/2009	5P	TU	*Washington	NW JACKSON SCHOOL RD AT NW WEST UNION RD	ANGL	057	02	028	DRY	2	011	011	0	0	N	N	N	
02678	06/05/2009	4P	FR	*Washington	NW JACKSON SCHOOL RD AT NW WEST UNION RD	ANGL		02	028	DRY	2	011	011	0	2	N	N	N	
03211	07/05/2009	5P	SU	*Washington	NW JACKSON SCHOOL RD AT NW WEST UNION RD	ANGL	001	02	028	DRY	2	011	091	0	2	N	N	N	
04597	09/12/2009	1P	SA	*Washington	NW JACKSON SCHOOL RD AT NW WEST UNION RD	ANGL		02	028	DRY	2	011	011	0	0	N	N	N	
06174	12/05/2009	12P	SA	*Washington	NW JACKSON SCHOOL RD AT NW WEST UNION RD	ANGL		02	028	DRY	2	011	011	0	0	N	N	N	
04555	09/01/2010	4P	WE	*Washington	NW JACKSON SCHOOL RD AT NW WEST UNION RD	ANGL		02	028	DRY	2	011	011	0	0	N	N	N	
04623	08/08/2007	6P	WE	*Washington	NW JACKSON SCHOOL RD AT NW WEST UNION RD	TURN		02	028	DRY	2	011	011	0	1	N	N	N	
06499	10/29/2007	11A	MO	*Washington	NW JACKSON SCHOOL RD AT NW WEST UNION RD	TURN		02	028	DRY	2	011	011	0	1	N	N	N	
01955	04/29/2009	4P	WE	*Washington	NW JACKSON SCHOOL RD AT NW WEST UNION RD	TURN		02	028	DRY	2	011	011	0	1	N	N	N	
01521	03/28/2010	7P	SU	*Washington	NW JACKSON SCHOOL RD AT NW WEST UNION RD	TURN		02	028	WET	2	011	011	0	2	N	N	N	
01905	04/10/2008	10P	TH	*Washington	NW JACKSON SCHOOL RD 19/100ths MI S OF NW WEST UNION RD	FIX	062,010	01	080,081	DRY	1	011		0	1	N	Y		

OREGON DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION  
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 CITY STREET LOCATIONS BY COUNTY - DRIVER BEHAVIOR FORMAT

Jackson School Road from Evergreen Road (Pkwy) to West Union Road plus 265 feet on all side streets and ramps  
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WASHINGTON COUNTY

SERIAL NO	DATE	TIME	DAY	*COUNTY OR CITY NAME	CRASH LOCATION	COLL TYPE	EVENT	CAUSE	ERROR	T O S U R F	V E H I C L E	PEOPLE					
												TYP/OWN	#1	#2	L J C D		
06542	11/23/2010	10A	TU	Hillsboro	NW EVERGREEN RD AT NW JACKSON SCHOOL RD	REAR	124	01,07	047,026	ICE	2	011	011	0	0	N	Y
05518	10/07/2008	11P	TU	Hillsboro	NW EVERGREEN RD AT NW JACKSON SCHOOL RD	TURN		02	004,028	DRY	2	011	011	0	0	Y	N
05579	10/13/2008	9A	MO	Hillsboro	NW EVERGREEN RD AT NW JACKSON SCHOOL RD	TURN		02	004,028	DRY	2	011	011	0	0	N	N
00480	01/27/2010	2P	WE	Hillsboro	NW EVERGREEN RD AT NW JACKSON SCHOOL RD	TURN		04	020	DRY	2	011	011	0	1	N	N
04826	09/15/2010	9A	WE	Hillsboro	NW EVERGREEN RD AT NW JACKSON SCHOOL RD	TURN		02	004,028	DRY	2	011	011	0	2	N	N

OREGON DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION  
TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT  
MULTNOMAH / WASHINGTON COUNTY ROAD CRASH LOCATIONS - DRIVER BEHAVIOR FORMAT

Jacobson Road from Cornelius Pass Road to Helvetia Road plus 265 feet on all side streets  
January 1, 2007 through December 31, 2010 \*\*2010 data is preliminary and subject to change

SERIAL NO	DATE	TIME	DAY	*COUNTY OR CITY NAME	CRASH LOCATION	COLL TYPE	EVENT	CAUSE	ERROR	PEOPLE							
										T O S U R F	T V E #1	VEHICLE TYP/OWN #2	I L L	I N J	A C C	E I D	
05878	11/20/2009	4P	FR	*Washington	NW HELVETIA RD AT NW JACOBSON RD	ANGL		02	028	WET	2	011	011	0	1	N	N

OREGON DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION  
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 CITY STREET LOCATIONS BY COUNTY - DRIVER BEHAVIOR FORMAT

Jacobson Road from Cornelius Pass Road to Helvetia Road plus 265 feet on all side streets  
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WASHINGTON COUNTY

SERIAL NO	DATE	TIME	DAY	*COUNTY OR CITY NAME	CRASH LOCATION	COLL TYPE EVENT	CAUSE	ERROR	T O S U R F	V E H I C L E	PEOPLE					
											TYP/OWN	#1	#2	L	J	C
07036	12/14/2010	4P	TU	Hillsboro	NW CENTURY BLVD AT NW JACOBSON RD	REAR 079	07	043,026	WET	2	011	011	0	1	N	N
01118	02/21/2007	9P	WE	Hillsboro	NW CORNELIUS PASS RD AT NW JACOBSON RD	ANGL 100,093	04	097,097	WET	2	011	011	0	2	N	N
01319	03/19/2009	5P	TH	Hillsboro	NW CORNELIUS PASS RD AT NW JACOBSON RD	REAR	07	026	DRY	2	011	011	0	0	N	N
05737	10/21/2008	4P	TU	Hillsboro	NW CROENI RD AT NW JACOBSON RD	ANGL	02	028	DRY	2	011	019	0	0	N	N
05811	10/22/2008	4P	WE	Hillsboro	NW CROENI RD AT NW JACOBSON RD	ANGL	02	028	DRY	2	019	011	0	0	N	N
05019	10/09/2009	9A	FR	Hillsboro	NW HELVETIA RD AT NW JACOBSON RD	TURN	02	028	DRY	2	011	011	0	0	N	N
00041	01/02/2007	4P	TU	Hillsboro	NW JACOBSON RD 500 FT E OF NW HELVETIA RD	REAR	07	026	WET	2	011	011	0	1	N	N

OREGON DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION  
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STATE HIGHWAY SYSTEM CRASH LOCATIONS - DRIVER BEHAVIOR FORMAT

US 26 (Hwy 047) MP 58.00 to 63.00 plus 265 feet on all on/off ramps  
January 1, 2007 through December 31, 2010 \*\*2010 data is preliminary and subject to change

SERIAL NO	DATE	T M I D M A Y E	*COUNTY OR CITY NAME	M N R H Y T P	C R A S H L O C A T I O N	C O L L T Y P E	E V E N T	C A U S E	E R R O R	D R Y W E T I C E	V E H I C L E T Y P # 1	O W N # 2	--PEOPLE--			
													I	I	A	E
05900	10/26/2008	8P SU	*Washington	MN R HY 047,	SUNSET AT MP 58.00	FIX 028,081		12	085	DRY 2	999 011	0 0	N N			
02554	05/31/2009	4P SU	*Washington	MN R HY 047,	SUNSET AT MP 58.24	REAR 001		30	050,042	DRY 2	011 091	0 2	N Y			
05020	10/10/2009	6A SA	*Washington	MN R HY 047,	SUNSET AT MP 58.50	REAR		32,16	052	DRY 2	011 011	0 2	N Y			
03966	08/07/2010	9P SA	*Washington	MN R HY 047,	SUNSET AT MP 58.55	SS-O		33,06	051,031,032	DRY 2	011 011	0 0	Y N			
02953	06/18/2010	5A FR	*Washington	MN R HY 047,	SUNSET AT MP 58.93	FIX 120		12	080,081	DRY 1	011	0 1	N N			
04209	07/23/2007	5P MO	*Washington	MN R HY 047,	SUNSET AT MP 59.00	FIX 079,010		01	047,081	DRY 1	011	0 1	N Y			
08041	12/27/2007	9A TH	*Washington	MN R HY 047,	SUNSET AT MP 59.31	SS-O		01	047,080,081	WET 2	051 011	0 1	N Y			
03350	06/15/2007	8P FR	*Washington	MN R HY 047,	SUNSET AT MP 59.47	FIX 043		33	051,080,081	DRY 1	011	0 0	N N			
02801	05/24/2008	6P SA	*Washington	MN R HY 047,	SUNSET AT MP 59.49	REAR 079		30,07	050,043	DRY 2	011 011	0 6	N Y			
04352	09/01/2009	6P TU	*Washington	MN R HY 047,	SUNSET AT MP 59.52	SS-O		01	080,047	DRY 2	011 011	0 0	N Y			
02178	05/09/2009	7A SA	*Washington	MN R HY 047,	SUNSET AT MP 59.74	REAR		01	047,042	DRY 2	011 011	0 2	N Y			
06384	10/23/2007	9A TU	*Washington	MN R HY 047,	SUNSET AT MP 59.83	FIX 092,043		26	080,081	DRY 1	011	0 0	N N			
06403	10/23/2007	9A TU	*Washington	MN R HY 047,	SUNSET AT MP 59.86	HEAD 089		15,33,30	046,051,050	DRY 2	011 011	0 2	N Y			
96403	10/23/2007	9A TU	*Washington	MN R HY 047,	SUNSET AT MP 59.88	NCOL 092,079,089		26	080,081	DRY 1	011	0 0	N N			
04170	08/18/2010	6P WE	*Washington	MN R HY 047,	SUNSET AT MP 60.06	OTH 028,068,080		24	085	DRY 4	011 011	0 0	N N			
01514	03/19/2008	3P WE	*Washington	MN R HY 047,	SUNSET AT MP 60.77	FIX 079,010,093		27,30	016,050,081	DRY 1	011	0 1	N Y			
04208	08/28/2009	4P FR	*Washington	MN R HY 047,	SUNSET AT MP 60.81	FIX 079,092		26	080,081,083	WET 1	011	0 1	N N			
02200	04/20/2009	4P MO	*Washington	MN R HY 047,	SUNSET AT MP 60.85	REAR 013		07	026	DRY 3	011 011	0 1	N N			
08111	12/26/2007	5A WE	*Washington	MN R HY 047,	SUNSET AT MP 61.00	FIX 079,124		01	047,080	ICE 1	011	0 1	N Y			
01127	03/08/2010	7P MO	*Washington	MN R HY 047,	SUNSET AT MP 61.02	FIX 124,120		01	047,080	ICE 1	011	0 0	N Y			
05111	09/28/2010	7A TU	Hillsboro	MN R HY 047,	SUNSET AT MP 61.05	REAR 013		07	026,042	DRY 4	011 011	0 1	N N			
04534	08/06/2007	9A MO	Hillsboro	MN R HY 047,	SUNSET AT MP 61.29	SS-O		13	045	DRY 2	011 051	0 0	N N			
01825	04/14/2010	8A WE	Hillsboro	MN R HY 047,	SUNSET AT MP 61.31	REAR 002		27,07	016,026	DRY 2	011 059	0 2	N N			
05753	10/26/2010	5P TU	Hillsboro	MN R HY 047,	SUNSET AT MP 62.00	REAR		27,07	016,043,026	DRY 2	011 011	0 0	N N			
07361	12/29/2010	9P WE	Hillsboro	MN R HY 047,	SUNSET AT MP 62.00	FIX 124,120		10	080	ICE 1	011	0 2	N N			
00748	02/12/2009	7A TH	Hillsboro	MN R HY 047,	SUNSET AT MP 62.08	REAR 013		07	026	DRY 3	011 011	0 3	N N			
05592	11/02/2009	7A MO	Hillsboro	MN R HY 047,	SUNSET AT MP 62.10	REAR		07	026	DRY 2	011 011	0 0	N N			
01469	03/18/2008	2A TU	Hillsboro	MN R HY 047,	SUNSET AT MP 62.10	FIX 054		01	047,080,081	WET 1	011	0 1	N Y			
03203	07/05/2010	7A MO	Hillsboro	MN R HY 047,	SUNSET AT MP 62.11	SS-O		13,33	051,045	DRY 2	011 011	0 1	N N			
02249	05/13/2009	4P WE	Hillsboro	MN R HY 047,	SUNSET AT MP 62.12	REAR		07	043,042	WET 2	011 011	0 0	N N			
05845	10/28/2010	5P TH	Hillsboro	MN R HY 047,	SUNSET AT MP 62.21	REAR 010		01	047,080,081	WET 2	011 011	0 1	N Y			
06161	10/17/2007	7A WE	Hillsboro	MN R HY 047,	SUNSET AT MP 62.25	REAR		07	026	DRY 2	011 011	0 1	N N			
03367	07/09/2010	10P FR	Hillsboro	MN R HY 047,	SUNSET AT MP 62.41	FIX 002,079,053		10	081	DRY 1	011	0 2	N N			
05446	10/06/2008	7A MO	Hillsboro	MN R HY 047,	SUNSET AT MP 62.44	REAR		07	026	WET 2	011 011	0 1	N N			
05114	09/28/2010	9A TU	Hillsboro	MN R HY 047,	SUNSET AT MP 62.44	REAR		07	026	DRY 2	011 999	0 0	N N			
05120	09/01/2007	5P SA	Hillsboro	MN R HY 047,	SUNSET AT MP 62.44	REAR		07	042	DRY 2	011 011	0 0	N N			
04987	10/07/2009	4P WE	Hillsboro	MN R HY 047,	SUNSET AT MP 62.44	SS-O		13	045	DRY 2	011 011	0 0	N N			
02535	05/13/2008	9A TU	Hillsboro	MN R HY 047,	SUNSET AT MP 62.45	REAR 013		07	042	WET 3	011 011	0 1	N N			
06349	10/24/2007	12A WE	Hillsboro	MN R HY 047,	SUNSET AT MP 62.45	SS-O 012,062		13	045	DRY 2	019 011	0 4	N N			
00948	02/26/2009	5A TH	Hillsboro	MN R HY 047,	SUNSET AT MP 62.47	SS-O 124		01	047,080	ICE 2	011 999	0 0	N Y			
06303	12/08/2009	5P TU	Hillsboro	MN R HY 047,	SUNSET AT MP 62.48	REAR		07	043,026	DRY 2	011 011	0 1	N N			
04325	07/30/2007	1P MO	Hillsboro	MN R HY 047,	SUNSET AT MP 62.48	SS-O 092		26	080	DRY 2	011 011	0 1	N N			
07764	12/17/2007	1A MO	Hillsboro	MN R HY 047,	SUNSET AT MP 62.51	NCOL		10	080	WET 1	011	0 0	Y N			
05308	10/24/2009	8P SA	Hillsboro	MN R HY 047,	SUNSET AT MP 62.55	SS-O 079,010		32,13	052,045	WET 2	011 011	0 1	N N			
00867	02/18/2010	4P TH	Hillsboro	MN R HY 047,	SUNSET AT MP 62.56	REAR 092		07,26	026	DRY 2	011 011	0 1	N N			
03283	06/09/2007	7A SA	Hillsboro	MN R HY 047,	SUNSET AT MP 62.71	REAR		07	026	DRY 2	019 011	0 0	N N			
07419	12/04/2007	9A TH	Hillsboro	MN R HY 047,	SUNSET AT MP 62.71	SS-O 012		13	045	WET 3	011 041	0 1	N N			
03913	08/05/2010	5P TU	Hillsboro	MN R HY 047,	SUNSET AT MP 62.74	REAR		07	043,042	DRY 2	011 011	0 0	N N			
04473	09/10/2009	9A TH	Hillsboro	MN R HY 047,	SUNSET AT MP 62.75	REAR		07	026	DRY 2	011 011	0 0	N N			
05707	11/07/2009	12P SA	Hillsboro	MN R HY 047,	SUNSET AT MP 62.83	TURN 124,120		01	047,080	WET 2	011 011	0 0	N Y			

OREGON DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION  
 TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT  
 STATE HIGHWAY SYSTEM CRASH LOCATIONS - DRIVER BEHAVIOR FORMAT

US 26 (Hwy 047) MP 58.00 to 63.00 plus 265 feet on all on/off ramps  
 January 1, 2007 through December 31, 2010 \*\*2010 data is preliminary and subject to change

SERIAL NO	DATE	T I D M A E Y	*COUNTY OR CITY NAME	M C L O G M P T N Y T P	CRASH LOCATION	COLL TYPE	EVENT	CAUSE	ERROR	T O T	--PEOPLE--			
											S U V R E F H	K I L	I I N	P A E L C D
05515	10/15/2010	8A FR	Hillsboro	MN R HY 047, SUNSET AT MP 62.92	REAR		27,07	016,042	DRY 2 011 011 0 0 N N					
04477	08/28/2008	8P TH	Hillsboro	MN R HY 047, SUNSET AT MP 62.97	FIX	062,101	10	080,081	DRY 1 011 1 0 Y N					
04527	09/02/2010	7A TH	Hillsboro	MN R HY 047, SUNSET AT MP 63.00	SS-O		13,02	045,028	DRY 2 041 011 0 0 N N					
02233	04/21/2007	4A SA	Hillsboro	MN R HY 047, SUNSET AT MP 63.00	FIX	079	01,16	047,081	DRY 1 011 0 0 N Y					
02400	05/06/2008	8A TU	*Washington	CN R HY 047, SUNSET AT MP 60.90	REAR		07	043,026	DRY 2 011 011 0 1 N N					
04652	09/07/2010	5A TU	Hillsboro	CN R HY 047, SUNSET AT MP 62.52	SS-O		13,02	045,028	DRY 2 041 011 0 0 N N					
00032	01/02/2008	2P WE	Hillsboro	CN R HY 047, SUNSET AT MP 62.53	REAR		07	026	WET 2 011 011 0 0 N N					
06622	11/01/2007	6A TH	Hillsboro	CN R HY 047, SUNSET AT MP 62.54	TURN	050	14,08	003,005	DRY 2 011 011 0 2 N N					
03405	06/27/2008	6A FR	Hillsboro	CN R HY 047, SUNSET AT MP 62.80	REAR		32	052,042	DRY 2 091 019 0 1 N N					

OREGON DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION  
 TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT  
 MULTNOMAH / WASHINGTON COUNTY ROAD CRASH LOCATIONS - DRIVER BEHAVIOR FORMAT

West Union Road from Cornelius Pass Road to Jackson School Road plus 265 feet on all side streets  
 January 1, 2007 through December 31, 2010 \*\*2010 data is preliminary and subject to change

SERIAL NO	DATE	TIME	DAY	*COUNTY OR CITY NAME	CRASH LOCATION	COLL TYPE	EVENT	CAUSE	ERROR	DRY	PEOPLE						
											VEHICLE TYP/OWN #1	I L	K I A E	S P			
02267	04/25/2007	1A	WE	*Washington	NW DICK RD AT NW WEST UNION RD	TURN		02	028	DRY	2	011	041	0	1	N	N
03397	07/14/2009	7A	TU	*Washington	NW GROVELAND RD AT NW WEST UNION RD	BACK		10	011,026	DRY	2	011	011	0	0	N	N
01178	03/11/2009	2P	WE	*Washington	NW JACKSON QUARRY RD 25/100ths MI E OF NW WEST UNION RD	FIX	079,010	01	047,080,081	DRY	1	011		0	0	N	Y
00051	01/03/2007	7P	WE	*Washington	NW JACKSON SCHOOL RD AT NW WEST UNION RD	ANGL	013	02	028	DRY	3	011	011	0	2	N	N
00981	02/16/2007	2P	FR	*Washington	NW JACKSON SCHOOL RD AT NW WEST UNION RD	ANGL	057,052,100	02	028	WET	2	011	011	0	1	N	N
02924	05/23/2007	12P	WE	*Washington	NW JACKSON SCHOOL RD AT NW WEST UNION RD	ANGL		02	028	DRY	2	011	011	0	1	N	N
03694	06/29/2007	8A	FR	*Washington	NW JACKSON SCHOOL RD AT NW WEST UNION RD	ANGL	057,028	02	028	WET	2	011	011	0	0	N	N
03299	06/25/2008	11P	WE	*Washington	NW JACKSON SCHOOL RD AT NW WEST UNION RD	ANGL		03	021	DRY	2	011	011	0	2	N	N
06868	12/15/2008	4P	MO	*Washington	NW JACKSON SCHOOL RD AT NW WEST UNION RD	ANGL		02	028	ICE	2	011	011	0	0	N	N
01990	05/27/2009	10A	WE	*Washington	NW JACKSON SCHOOL RD AT NW WEST UNION RD	ANGL		02	028	DRY	2	011	011	0	1	N	N
02593	06/02/2009	5P	TU	*Washington	NW JACKSON SCHOOL RD AT NW WEST UNION RD	ANGL	057	02	028	DRY	2	011	011	0	0	N	N
02678	06/05/2009	4P	FR	*Washington	NW JACKSON SCHOOL RD AT NW WEST UNION RD	ANGL		02	028	DRY	2	011	011	0	2	N	N
03211	07/05/2009	5P	SU	*Washington	NW JACKSON SCHOOL RD AT NW WEST UNION RD	ANGL	001	02	028	DRY	2	011	091	0	2	N	N
04597	09/12/2009	1P	SA	*Washington	NW JACKSON SCHOOL RD AT NW WEST UNION RD	ANGL		02	028	DRY	2	011	011	0	0	N	N
06174	12/05/2009	12P	SA	*Washington	NW JACKSON SCHOOL RD AT NW WEST UNION RD	ANGL		02	028	DRY	2	011	011	0	0	N	N
04555	09/01/2010	4P	WE	*Washington	NW JACKSON SCHOOL RD AT NW WEST UNION RD	ANGL		02	028	DRY	2	011	011	0	0	N	N
04623	08/08/2007	6P	WE	*Washington	NW JACKSON SCHOOL RD AT NW WEST UNION RD	TURN		02	028	DRY	2	011	011	0	1	N	N
06499	10/29/2007	11A	MO	*Washington	NW JACKSON SCHOOL RD AT NW WEST UNION RD	TURN		02	028	DRY	2	011	011	0	1	N	N
01955	04/29/2009	4P	WE	*Washington	NW JACKSON SCHOOL RD AT NW WEST UNION RD	TURN		02	028	DRY	2	011	011	0	1	N	N
01521	03/28/2010	7P	SU	*Washington	NW JACKSON SCHOOL RD AT NW WEST UNION RD	TURN		02	028	WET	2	011	011	0	2	N	N
03758	07/20/2008	11A	SU	*Washington	NW WEST UNION RD 2/100ths MI SE OF NW JACKSON SCHOOL RD	TURN		06	032	DRY	2	011	011	0	1	N	N

OREGON DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION  
 TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT  
 CITY STREET LOCATIONS BY COUNTY - DRIVER BEHAVIOR FORMAT

West Union Road from Cornelius Pass Road to Jackson School Road plus 265 feet on all side streets  
 January 1, 2007 through December 31, 2010 \*\*2010 data is preliminary and subject to change

WASHINGTON COUNTY

SERIAL NO	DATE	TIME	DAY	*COUNTY OR CITY NAME	CRASH LOCATION	COLL TYPE	EVENT	CAUSE	ERROR	T O S U R F	V E H I C L E	PEOPLE				
												TYP/OWN	#1	#2	L I N E L E N D	
03464	07/13/2010	7P	TU	Hillsboro	BENDEMEER RD AT WEST UNION RD	TURN	001	06,02	034,027	DRY	1	011	0	1	N	N



# Appendix D. Traffic Volume Development



## **Appendix D-1. Intersection Turn Movement Counts**



#### Appendix D: Intersection Turn Movement Counts

#	Location	Peak Hour		Date Collected
		AM	PM	
1	Jackson School Road at West Union Road	6:45 - 7:45	4:45 - 5:45	5/25/2011
2	Jackson Quarry Road at West Union Road	Not counted	4:30 - 5:30	5/25/2011
3	Jackson School Road at US-26 WB Ramps	7:15 - 8:15	5:00 - 6:00	5/25/2011
4	Jackson School Road at US-26 EB Ramps	7:00 - 8:00	4:30 - 5:30	5/25/2011
5	Jackson School Road at Scotch Church Road	Not counted	4:45 - 5:45	10/19/2010
6	Jackson School Road at Meek Road	7:00 - 8:00	4:45 - 5:45	5/25/2011
7	Jackson School Road at Evergreen Road	7:15 - 8:15	5:00 - 6:00	5/25/2011
8	15th Avenue at Evergreen Road	7:30 - 8:30	4:45 - 5:45	10/19/2010
9	25th Avenue at Evergreen Road	7:45 - 8:45	5:00 - 6:00	10/19/2010 - AM 03/21/2007 - PM
10	Eggiman Road/273rd Avenue at Evergreen Road	Not counted	5:00 - 6:00	5/25/2011
11	Groveland Road at West Union Road	Not counted	4:15 - 5:15	5/25/2011
12	Groveland Road at Groveland Drive	Not counted	4:45 - 5:45	5/25/2011
13	Sewell Road at Meek Road	Not counted	4:30 - 5:30	5/25/2011
14	Sewell Road at Evergreen Road	7:45 - 8:45	5:00 - 6:00	10/19/2010 - AM 03/21/2007 - PM
15	Meier-Jurgen Road at Evergreen Road	Not counted	5:00 - 6:00	5/25/2011
16	Helvetia Rd North at West Union Road	7:15 - 8:15	4:45 - 5:45	5/25/2011
17	Helvetia Rd Middle at West Union Road	7:15 - 8:15	4:45 - 5:45	5/25/2011
18	Helvetia Rd South at West Union Road	7:15 - 8:15	4:45 - 5:45	5/25/2011
19	Helvetia Road at Pubols Road	Not counted	4:30 - 5:30	5/25/2011
20	Helvetia Road at Schaff Road	7:15 - 8:15	4:30 - 5:30	5/25/2011
21	Helvetia Road at Groveland Drive/Jacobson Road	7:15 - 8:15	4:30 - 5:30	5/25/2011
22	Brookwood Parkway/Helvetia Road at US-26 WB Ramps	7:30 - 8:30	4:30 - 5:30	7/20/2011
23	Brookwood Parkway/Helvetia Road at US-26 EB Ramps	7:15 - 8:15	4:30 - 5:30	7/20/2011
24	Brookwood Parkway at Meek Road	7:30 - 8:30	4:30 - 5:30	5/25/2011
25	Brookwood Parkway at Huffman Street	7:30 - 8:30	4:30 - 5:30	5/25/2011
26	Brookwood Parkway at Genentech Access	7:30 - 8:30	4:30 - 5:30	5/25/2011

#	Location	Peak Hour		Date Collected
27	Brookwood Parkway at Evergreen Road	7:30 - 8:30	5:00 - 6:00	5/25/2011
28	Century Blvd/Dick Road at West Union Road	Not counted	4:30 - 5:30	5/25/2011
29	Century Blvd at Jacobson Road	7:45 - 8:45	4:30 - 5:30	5/25/2011
30	Croeni Road at Jacobson Road	7:30 - 8:30	4:30 - 5:30	5/25/2011
31	235th Avenue at Evergreen Parkway	Not counted	5:00 - 6:00	5/25/2011
32	229th Avenue at Evergreen Parkway	7:15 - 8:15	5:15 - 6:15	10/19/2010
33	Cornelius Pass Road at West Union Road	7:15 - 8:15	4:45 - 5:45	5/25/2011
34	Cornelius Pass Road at Jacobson Road	Not counted	4:45 - 5:45	5/25/2011
35	Cornelius Pass Road at Rock Creek Blvd	Not counted	4:45 - 5:45	5/25/2011
36	Cornelius Pass Road at US-26 WB Ramps	7:00 - 8:00	4:30 - 5:30	5/25/2011
37	Cornelius Pass Road at US-26 EB Ramps	7:00 - 8:00	4:30 - 5:30	5/25/2011
38	Cornelius Pass Road at Evergreen Parkway	7:15 - 8:15	4:45 - 5:45	5/25/2011
39	Cornelius Pass Road at Wagon Way	7:00 - 8:00	4:30 - 5:30	5/25/2011
A	Glencoe Road WB On-ramp to US-26	7:45 - 8:45	3:15 - 4:15	5/25/2011
B	US-26 WB Off-ramp to Glencoe Road	6:45 - 7:45	4:45 - 5:45	5/25/2011
C	Jackson School Road WB On-ramp to US-26	7:30 - 8:30	4:45 - 5:45	5/25/2011
D	US-26 WB Off-ramp to Jackson School Road	7:15 - 8:15	4:45 - 5:45	5/25/2011
E	Cornelius Pass Road WB On-ramp to US-26	7:15 - 8:15	4:30 - 5:30	5/25/2011

## **Appendix D-2. Adjustment Factors**



**Seasonal Adjustment for March**

**Bend-Empire (09-007) US97; MP 135.95; THE DALLES-CALIFORNIA  
HIGHWAY NO. 4; 0.49 mile south of Empire Avenue**

Peak Month

Year	Month	% ADT	AWT
2009	Aug	118	50,000
2008	Jul	118	51,366
2007	Aug	117	54,739
2006	Aug	117	54,043
2005	Aug	121	52,537
		<b>117.7</b>	<b>52,035</b>

Count Month (Mar)

Year	Month	% ADT	AWT
2009	Mar	103	43,401
2008	Mar	107	46,419
2007	Mar	107	49,682
2006	Mar	102	47,191
2005	Mar	103	44,772
		<b>104.3</b>	<b>46,758</b>

Seasonal Factor **1.13**

**Beltline (20-011) OR569; MP 12.00; BELTLINE HIGHWAY NO. 69; 0.76 mile  
west of Pacific Highway No. 1 (I-5)**

Peak Month

Year	Month	% ADT	AWT
2009	Aug	118	57,413
2008	June	112	50,600
2007	Aug	110	52,000
2006	June	112	55,584
2005	June	127	66,607
		<b>114.0</b>	<b>54,532</b>

Count Month (Mar)

Year	Month	% ADT	AWT
2009	Mar	103	50,000
2008	Mar	108	48,800
2007	Mar	107	50,691
2006	Mar	105	52,374
2005	Mar	101	52,667
		<b>105.0</b>	<b>50,622</b>

Seasonal Factor **1.09**

2 ATR Average **1.11**

**Note:** Data shown in gray was removed from calculation as per APM

**Seasonal Adjustment for May**

**Bend-Empire (09-007) US97; MP 135.95; THE DALLES-CALIFORNIA HIGHWAY NO. 4; 0.49 mile south of Empire Avenue**

Peak Month

Year	Month	% ADT	AWT
2009	Aug	118	50,000
2008	Jul	118	51,366
2007	Aug	117	54,739
2006	Aug	117	54,043
2005	Aug	121	52,537
		<b>117.7</b>	<b>52,035</b>

Count Month (May)

Year	Month	% ADT	AWT
2009	May	112	47,067
2008	May	113	49,172
2007	May	110	51,388
2006	May	109	50,069
2005	May	110	47,796

Count Month (June)

Year	Month	% ADT	AWT
2009	June	116	49,000
2008	June	117	50,599
2007	June	116	54,126
2006	June	115	52,992
2005	June	112	48,800

Count Month Average

Year	Month	% ADT	AWT
2009	May-Jun	114	48,034
2008	May-Jun	115	49,886
2007	May-Jun	113	52,757
2006	May-Jun	112	51,531
2005	May-Jun	111	48,298
		<b>113.0</b>	<b>50,774</b>

Seasonal Factor **1.04**

**Beltline (20-011) OR569; MP 12.00; BELTLINE HIGHWAY NO. 69; 0.76 mile west of Pacific Highway No. 1 (I-5)**

Peak Month

Year	Month	% ADT	AWT
2009	Aug	118	57,413
2008	June	112	50,600
2007	Aug	110	52,000
2006	June	112	55,584
2005	June	127	66,607
		<b>114.0</b>	<b>54,532</b>

Count Month (May)

Year	Month	% ADT	AWT
2009	May	103	50,000
2008	May	106	48,200
2007	May	106	50,100
2006	May	107	53,195
2005	May	112	58,336

Count Month (June)

Year	Month	% ADT	AWT
2009	June	107	52,000
2008	June	112	50,600
2007	June	107	50,500
2006	June	112	55,584
2005	June	127	66,607

Count Month Average

Year	Month	% ADT	AWT
2009	May-Jun	105	51,000
2008	May-Jun	109	49,400
2007	May-Jun	106.5	50,300
2006	May-Jun	109.5	54,390
2005	May-Jun	119.5	62,472
		<b>108.3</b>	<b>51,363</b>

Seasonal Factor **1.05**

2 ATR Average **1.05**

Note: Data shown in gray was removed from calculation as per APM

**Seasonal Adjustment for October**

**Bend-Empire (09-007) US97; MP 135.95; THE DALLES-CALIFORNIA  
HIGHWAY NO. 4; 0.49 mile south of Empire Avenue**

Peak Month

Year	Month	% ADT	AWT
2009	Aug	118	50,000
2008	Jul	118	51,366
2007	Aug	117	54,739
2006	Aug	117	54,043
2005	Aug	121	52,537
		<b>117.7</b>	<b>52,035</b>

Count Month (Oct)

Year	Month	% ADT	AWT
2009	Oct	109	45,800
2008	Oct	108	46,860
2007	Oct	108	50,245
2006	Oct	110	50,881
2005	Oct	111	48,076
		<b>109.0</b>	<b>48,975</b>

Seasonal Factor **1.08**

**Beltline (20-011) OR569; MP 12.00; BELTLINE HIGHWAY NO. 69; 0.76 mile  
west of Pacific Highway No. 1 (I-5)**

Peak Month

Year	Month	% ADT	AWT
2009	Aug	118	57,413
2008	June	112	50,600
2007	Aug	110	52,000
2006	June	112	55,584
2005	June	127	66,607
		<b>114.0</b>	<b>54,532</b>

Count Month (Oct)

Year	Month	% ADT	AWT
2009	Oct	114	55,393
2008	Oct	110	49,600
2007	Oct	107	50,700
2006	Oct	105	52,163
2005	Oct	103	53,645
		<b>107.3</b>	<b>50,821</b>

Seasonal Factor **1.06**

2 ATR Average **1.07**

**Note:** Data shown in gray was removed from calculation as per APM

### 2007 Annual factor development

Volume (vplph) at Cornelius Pass EB detector at MP 62.47

Summary of midweekday 24-hour counts

	<b>Volume</b>	<b># days</b>	<b>Daily average</b>
June 2007	158,051	12	13,171
June 2011	184,033	14	13,145
Annual Factor			<b>1.00</b>

### 2010 Annual factor development

Volume (vplph) at Cornelius Pass EB detector at MP 62.47

Summary of midweekday 24-hour counts

June 2010	174,173	13	13,398
June 2011	184,033	14	13,145
Annual Factor			<b>0.98</b>

**Note 1:** Volumes taken from PORTAL data

**Note 2:** The Cornelius Pass detector was the only one in the study area that provided high fidelity data for all time periods.

## **Appendix D-3. Volume Development**



Project: Brookwood IAMP  
 Job #: ODOT 701  
 Subject: **AM Turning Movement Volumes**  
 Created: 6/27/2011  
 Rev. Date: 1/20/2012

Int #	Synchro ID	Intersection	Direction	Movement	Existing Counts	Existing	Existing	Seasonal Adjustment	2011 Growth	Existing	Existing
					1-Hr Volume AM Peak	Heavy Vehicle Count	Heavy Vehicle Percentage			Factor	Adjustment Factor
21	10	Jackson Sch Rd @ West Union Rd 16 hr Turning Movement Count Count Date: 5/25/2011 2011 AM Peak Hour: 6:45 AM-7:45 AM AM Peak Hour Used: 7:30 AM-8:30 AM PHF: 0.79	EB	EBL	2	1	50%	1.05	1.00	0	0
				EBT	45	6	13%	1.05	1.00	45	45
				EBR	32	6	19%	1.05	1.00	35	35
			WB	WBL	35	3	9%	1.05	1.00	35	35
				WBT	33	3	9%	1.05	1.00	35	35
				WBR	1	0	0%	1.05	1.00	0	0
			NB	NBL	21	1	5%	1.05	1.00	20	20
				NBT	16	2	13%	1.05	1.00	15	15
				NBR	19	1	5%	1.05	1.00	20	20
			SB	SBL	6	0	0%	1.05	1.00	5	5
				SBT	43	0	0%	1.05	1.00	45	45
				SBR	3	0	0%	1.05	1.00	5	5
			<b>TEV</b>					<b>256</b>	<b>23</b>	<b>9%</b>	
30	20	Jackson Quarry Rd @ West Union Rd 3 hr PM Turning Movement Count Count Date: 5/25/2011 2011 AM Peak Hour: 10:30 AM-11:30 AM AM Peak Hour Used: 7:30 AM-8:30 AM PHF: #DIV/0!	EB	EBL	0	0	0%	1.05	1.00	0	0
				EBT	0	0	0%	1.05	1.00	0	0
				EBR	0	0	0%	1.05	1.00	0	0
			WB	WBL	0	0	0%	1.05	1.00	0	0
				WBT	0	0	0%	1.05	1.00	0	0
				WBR	0	0	0%	1.05	1.00	0	0
			NB	NBL	0	0	0%	1.05	1.00	0	0
				NBT	0	0	0%	1.05	1.00	0	0
				NBR	0	0	0%	1.05	1.00	0	0
			SB	SBL	0	0	0%	1.05	1.00	0	0
				SBT	0	0	0%	1.05	1.00	0	0
				SBR	0	0	0%	1.05	1.00	0	0
			<b>TEV</b>					<b>0</b>	<b>0</b>	<b>0%</b>	
22	30	Jackson Sch Rd @ US26 WB Ramps 16 hr Turning Movement Count Count Date: 5/25/2011 2011 AM Peak Hour: 7:15 AM-8:15 AM AM Peak Hour Used: 7:30 AM-8:30 AM PHF: 0.87	EB	EBL	0	0	0%	1.05	1.00	0	0
				EBT	0	0	0%	1.05	1.00	0	0
				EBR	0	0	0%	1.05	1.00	0	0
			WB	WBL	352	16	5%	1.05	1.00	370	370
				WBT	1	0	0%	1.05	1.00	0	0
				WBR	22	2	9%	1.05	1.00	25	25
			NB	NBL	35	2	6%	1.05	1.00	35	35
				NBT	35	1	3%	1.05	1.00	35	40
				NBR	0	0	0%	1.05	1.00	0	0
			SB	SBL	0	0	0%	1.05	1.00	0	0
				SBT	103	5	5%	1.05	1.00	110	110
				SBR	2	0	0%	1.05	1.00	0	0
			<b>TEV</b>					<b>550</b>	<b>26</b>	<b>5%</b>	
23	40	Jackson Sch Rd @ US26 EB Ramps 16 hr Turning Movement Count Count Date: 5/25/2011 2011 AM Peak Hour: 7:00 AM-8:00 AM AM Peak Hour Used: 7:30 AM-8:30 AM PHF: 0.86	EB	EBL	3	1	33%	1.05	1.00	5	5
				EBT	0	0	0%	1.05	1.00	0	0
				EBR	77	2	3%	1.05	1.00	80	80
			WB	WBL	0	0	0%	1.05	1.00	0	0
				WBT	0	0	0%	1.05	1.00	0	0
				WBR	0	0	0%	1.05	1.00	0	0
			NB	NBL	0	0	0%	1.05	1.00	0	0
				NBT	66	4	6%	1.05	1.00	70	70
				NBR	531	30	6%	1.05	1.00	560	560
			SB	SBL	52	5	10%	1.05	1.00	55	55
				SBT	394	19	5%	1.05	1.00	415	425
				SBR	0	0	0%	1.05	1.00	0	0
			<b>TEV</b>					<b>1123</b>	<b>61</b>	<b>5%</b>	
24	50	Jackson Sch Rd @ Scotch Church Rd 2 hr PM Turning Movement Count Count Date: 5/25/2011 2011 AM Peak Hour: 10:30 AM-11:30 AM AM Peak Hour Used: 7:30 AM-8:30 AM PHF: #DIV/0!	EB	EBL	0	0	0%	1.05	1.00	0	0
				EBT	0	0	0%	1.05	1.00	0	0
				EBR	0	0	0%	1.05	1.00	0	0
			WB	WBL	0	0	0%	1.05	1.00	0	0
				WBT	0	0	0%	1.05	1.00	0	0
				WBR	0	0	0%	1.05	1.00	0	0
			NB	NBL	0	0	0%	1.05	1.00	0	0
				NBT	0	0	0%	1.05	1.00	0	0
				NBR	0	0	0%	1.05	1.00	0	0
			SB	SBL	0	0	0%	1.05	1.00	0	0
				SBT	0	0	0%	1.05	1.00	0	0
				SBR	0	0	0%	1.05	1.00	0	0
			<b>TEV</b>					<b>0</b>	<b>0</b>	<b>0%</b>	
25	60	Jackson Sch Rd @ Meek Rd 3 hr AM/2 hr PM Turning Movement Count Count Date: 5/25/2011 2011	EB	EBL	0	0	0%	1.05	1.00	0	0
				EBT	0	0	0%	1.05	1.00	0	0
				EBR	0	0	0%	1.05	1.00	0	0
			WB	WBL	3	0	0%	1.05	1.00	5	5

Project: Brookwood IAMP  
 Job #: ODOT 701  
 Subject: **AM Turning Movement Volumes**  
 Created: 6/27/2011  
 Rev. Date: 1/20/2012

Int #	Synchro ID	Intersection	Direction	Movement	Existing Counts 1-Hr Volume AM Peak	Existing Heavy Vehicle Count	Existing Heavy Vehicle Percentage	Seasonal Adjustment Factor	2011 Growth Adjustment Factor	Existing ROUNDED DHV 1-Hr Volume AM Peak	Existing BALANCED DHV 1-Hr Volume AM Peak		
												TEV	TEV
60	60	AM Peak Hour: 7:00 AM-8:00 AM AM Peak Hour Used: 7:30 AM-8:30 AM PHF: 0.86	WB	WBT	0	0	0%	1.05	1.00	0	0		
				WBR	11	0	0%	1.05	1.00	10	10		
			NB	NBL	0	0	0%	1.05	1.00	0	0		
				NBT	424	11	3%	1.05	1.00	445	445		
				NBR	3	0	0%	1.05	1.00	5	5		
			SB	SBL	12	3	25%	1.05	1.00	15	15		
				SBT	433	11	3%	1.05	1.00	455	455		
				SBR	0	0	0%	1.05	1.00	0	0		
				TEV			886	25	3%			935	935
			26	70	Jackson Sch Rd @ Evergreen Rd 16 hr Turning Movement Count Count Date: 5/25/2011 2011 AM Peak Hour: 7:15 AM-8:15 AM AM Peak Hour Used: 7:30 AM-8:30 AM PHF: 0.87	EB	EBL	355	11	3%	1.05	1.00	375
	EBT	564				26	5%	1.05	1.00	590	590		
	EBR	0				0	0%	1.05	1.00	0	0		
WB	WBL	3				0	0%	1.05	1.00	5	5		
	WBT	205				19	9%	1.05	1.00	215	215		
	WBR	84				2	2%	1.05	1.00	90	90		
NB	NBL	1				0	0%	1.05	1.00	0	0		
	NBT	3				0	0%	1.05	1.00	5	5		
	NBR	3				0	0%	1.05	1.00	5	5		
SB	SBL	152				4	3%	1.05	1.00	160	160		
	SBT	0				0	0%	1.05	1.00	0	0		
	SBR	285				3	1%	1.05	1.00	300	300		
	TEV						1655	65	4%			1745	1745
27	80	15th Avenue @ Evergreen Rd 2 hr AM/PM Turning Movement Count Count Date: 10/19/2010 2010 AM Peak Hour: 7:30 AM-8:30 AM AM Peak Hour Used: 7:30 AM-8:30 AM PHF: 0.89				EB	EBL	0	0	0%	1.07	0.98	0
				EBT	518	20	4%	1.07	0.98	545	550		
				EBR	196	2	1%	1.07	0.98	205	205		
			WB	WBL	298	2	1%	1.07	0.98	310	335		
				WBT	234	20	9%	1.07	0.98	245	265		
				WBR	0	0	0%	1.07	0.98	0	0		
			NB	NBL	92	5	5%	1.07	0.98	95	95		
				NBT	0	0	0%	1.07	0.98	0	0		
				NBR	177	1	1%	1.07	0.98	185	190		
			SB	SBL	0	0	0%	1.07	0.98	0	0		
				SBT	0	0	0%	1.07	0.98	0	0		
				SBR	0	0	0%	1.07	0.98	0	0		
				TEV			1515	50	3%			1585	1640
			28	90	25th Avenue @ Evergreen Rd 2 hr AM/PM Turning Movement Count Count Date: 10/19/2010 2010 AM Peak Hour: 7:45 AM-8:45 AM AM Peak Hour Used: 7:30 AM-8:30 AM PHF: 0.89	EB	EBL	0	0	0%	1.07	0.98	0
	EBT	603				14	2%	1.07	0.98	630	630		
	EBR	104				1	1%	1.07	0.98	110	110		
WB	WBL	513				13	3%	1.07	0.98	540	540		
	WBT	487				13	3%	1.07	0.98	510	540		
	WBR	0				0	0%	1.07	0.98	0	0		
NB	NBL	55				5	9%	1.07	0.98	60	60		
	NBT	0				0	0%	1.07	0.98	0	0		
	NBR	153				9	6%	1.07	0.98	160	160		
SB	SBL	0				0	0%	1.07	0.98	0	0		
	SBT	0				0	0%	1.07	0.98	0	0		
	SBR	0				0	0%	1.07	0.98	0	0		
	TEV						1915	55	3%			2010	2040
29	100	Eggiman Rd @ Evergreen Rd 3 hr PM Turning Movement Count Count Date: 5/25/2011 2011 AM Peak Hour: 10:30 AM-11:30 AM AM Peak Hour Used: 7:30 AM-8:30 AM PHF: #DIV/0!				EB	EBL	0	0	0%	1.05	1.00	0
				EBT	0	0	0%	1.05	1.00	0	0		
				EBR	0	0	0%	1.05	1.00	0	0		
			WB	WBL	0	0	0%	1.05	1.00	0	0		
				WBT	0	0	0%	1.05	1.00	0	0		
				WBR	0	0	0%	1.05	1.00	0	0		
			NB	NBL	0	0	0%	1.05	1.00	0	0		
				NBT	0	0	0%	1.05	1.00	0	0		
				NBR	0	0	0%	1.05	1.00	0	0		
			SB	SBL	0	0	0%	1.05	1.00	0	0		
				SBT	0	0	0%	1.05	1.00	0	0		
				SBR	0	0	0%	1.05	1.00	0	0		
				TEV			0	0	0%			0	0
			19	110	Groveland Rd @ West Union Rd 3 hr PM Turning Movement Count Count Date: 5/25/2011 2011 AM Peak Hour: 10:30 AM-11:30 AM AM Peak Hour Used: 7:30 AM-8:30 AM	EB	EBL	0	0	0%	1.05	1.00	0
	EBT	0				0	0%	1.05	1.00	0	0		
	EBR	0				0	0%	1.05	1.00	0	0		
WB	WBL	0				0	0%	1.05	1.00	0	0		
	WBT	0				0	0%	1.05	1.00	0	0		
	WBR	0				0	0%	1.05	1.00	0	0		
NB	NBL	0				0	0%	1.05	1.00	0	0		
	NBT	0				0	0%	1.05	1.00	0	0		
	NBR	0				0	0%	1.05	1.00	0	0		

Project: Brookwood IAMP  
 Job #: ODOT 701  
 Subject: **AM Turning Movement Volumes**  
 Created: 6/27/2011  
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Int #	Synchro ID	Intersection	Direction	Movement	Existing Counts	Existing Heavy Vehicle	Existing Heavy Vehicle	Seasonal Adjustment	2011 Growth	Existing ROUNDED	Existing BALANCED
					1-Hr Volume AM Peak	Count	Percentage			1-Hr Volume AM Peak	1-Hr Volume AM Peak
110	PHF: #DIV/0!			NBR	0	0	0%	1.05	1.00	0	0
				SBL	0	0	0%	1.05	1.00	0	0
				SB	0	0	0%	1.05	1.00	0	0
				SBT	0	0	0%	1.05	1.00	0	0
				SBR	0	0	0%	1.05	1.00	0	0
		TEV		0	0	0%			0	0	
18	Groveland Rd @ Groveland Drive 3 hr PM Turning Movement Count Count Date: 5/25/2011 2011 AM Peak Hour: 10:30 AM-11:30 AM AM Peak Hour Used: 7:30 AM-8:30 AM PHF: #DIV/0!			EBL	0	0	0%	1.05	1.00	0	0
				EBT	0	0	0%	1.05	1.00	0	0
				EBR	0	0	0%	1.05	1.00	0	0
				WB	0	0	0%	1.05	1.00	0	0
				WBL	0	0	0%	1.05	1.00	0	0
				WBT	0	0	0%	1.05	1.00	0	0
				WBR	0	0	0%	1.05	1.00	0	0
				NB	0	0	0%	1.05	1.00	0	0
				NBL	0	0	0%	1.05	1.00	0	0
				NBT	0	0	0%	1.05	1.00	0	0
				NBR	0	0	0%	1.05	1.00	0	0
				SB	0	0	0%	1.05	1.00	0	0
				SBL	0	0	0%	1.05	1.00	0	0
				SBT	0	0	0%	1.05	1.00	0	0
SBR	0	0	0%	1.05	1.00	0	0				
		TEV		0	0	0%			0	0	
16	Sewell Rd @ Meek Rd 3 hr PM Turning Movement Count Count Date: 5/25/2011 2011 AM Peak Hour: 10:30 AM-11:30 AM AM Peak Hour Used: 7:30 AM-8:30 AM PHF: #DIV/0!			EBL	0	0	0%	1.05	1.00	0	0
				EBT	0	0	0%	1.05	1.00	0	0
				EBR	0	0	0%	1.05	1.00	0	0
				WB	0	0	0%	1.05	1.00	0	0
				WBL	0	0	0%	1.05	1.00	0	0
				WBT	0	0	0%	1.05	1.00	0	0
				WBR	0	0	0%	1.05	1.00	0	0
				NB	0	0	0%	1.05	1.00	0	0
				NBL	0	0	0%	1.05	1.00	0	0
				NBT	0	0	0%	1.05	1.00	0	0
				NBR	0	0	0%	1.05	1.00	0	0
				SB	0	0	0%	1.05	1.00	0	0
				SBL	0	0	0%	1.05	1.00	0	0
				SBT	0	0	0%	1.05	1.00	0	0
SBR	0	0	0%	1.05	1.00	0	0				
		TEV		0	0	0%			0	0	
13	Sewell Rd @ Evergreen Rd 2 hr AM/PM Turning Movement Count Count Date: 10/19/2010 2010 AM Peak Hour: 7:45 AM-8:45 AM AM Peak Hour Used: 7:30 AM-8:30 AM PHF: 0.85			EBL	8	3	38%	1.07	0.98	10	10
				EBT	744	27	4%	1.07	0.98	780	780
				EBR	1	1	100%	1.07	0.98	0	0
				WB	2	2	100%	1.07	0.98	0	0
				WBL	970	24	2%	1.07	0.98	1015	1015
				WBT	7	1	14%	1.07	0.98	5	5
				WBR	2	1	50%	1.07	0.98	0	0
				NB	0	0	0%	1.07	0.98	0	0
				NBL	1	1	100%	1.07	0.98	0	0
				NBT	5	2	40%	1.07	0.98	5	5
				NBR	1	1	100%	1.07	0.98	0	0
				SB	10	2	20%	1.07	0.98	10	10
				SBL	1	1	100%	1.07	0.98	0	0
				SBT	10	2	20%	1.07	0.98	10	10
SBR	1751	65	4%			1825	1825				
		TEV		1751	65	4%			1825	1825	
14	Meier-Jurgen Rd @ Evergreen Rd 3 hr PM Turning Movement Count Count Date: 5/25/2011 2011 AM Peak Hour: 10:30 AM-11:30 AM AM Peak Hour Used: 7:30 AM-8:30 AM PHF: #DIV/0!			EBL	0	0	0%	1.05	1.00	0	0
				EBT	0	0	0%	1.05	1.00	0	0
				EBR	0	0	0%	1.05	1.00	0	0
				WB	0	0	0%	1.05	1.00	0	0
				WBL	0	0	0%	1.05	1.00	0	0
				WBT	0	0	0%	1.05	1.00	0	0
				WBR	0	0	0%	1.05	1.00	0	0
				NB	0	0	0%	1.05	1.00	0	0
				NBL	0	0	0%	1.05	1.00	0	0
				NBT	0	0	0%	1.05	1.00	0	0
				NBR	0	0	0%	1.05	1.00	0	0
				SB	0	0	0%	1.05	1.00	0	0
				SBL	0	0	0%	1.05	1.00	0	0
				SBT	0	0	0%	1.05	1.00	0	0
SBR	0	0	0%	1.05	1.00	0	0				
		TEV		0	0	0%			0	0	
1	Helvetia Rd North @ West Union Rd 3 hr AM/PM Turning Movement Count Count Date: 5/25/2011 2011 AM Peak Hour: 7:15 AM-8:15 AM AM Peak Hour Used: 7:30 AM-8:30 AM PHF: 0.74			EBL	11	0	0%	1.05	1.00	10	10
				EBT	0	0	0%	1.05	1.00	0	0
				EBR	0	0	0%	1.05	1.00	0	0
				WB	0	0	0%	1.05	1.00	0	0
				WBL	0	0	0%	1.05	1.00	0	0
				WBT	0	0	0%	1.05	1.00	0	0
				WBR	0	0	0%	1.05	1.00	0	0
				NB	0	0	0%	1.05	1.00	0	0
				NBL	23	0	0%	1.05	1.00	25	25
				NBT	0	0	0%	1.05	1.00	0	0
				NBR	0	0	0%	1.05	1.00	0	0
				SB	64	0	0%	1.05	1.00	65	65
				SBL	0	0	0%	1.05	1.00	0	0
				SBT	18	1	6%	1.05	1.00	20	20
SBR	0	1	6%	1.05	1.00	20	20				
		TEV		11	1	6%			20	20	

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 Created: 6/27/2011  
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Int #	Synchro ID	Intersection	Direction	Movement	Existing Counts	Existing	Existing	Seasonal Adjustment	2011 Growth	Existing	Existing	
					1-Hr Volume AM Peak	Heavy Vehicle Count	Heavy Vehicle Percentage			Factor	Adjustment Factor	ROUNDED DHV 1-Hr Volume AM Peak
					<b>TEV</b>	<b>116</b>	<b>1</b>	<b>1%</b>			<b>120</b>	<b>120</b>
2	170	Helvetia Rd Middle @ West Union Rd 16 hr Turning Movement Count Count Date: 5/25/2011 2011	EB	EBL	1	0	0%	1.05	1.00	0	0	
				EBT	51	2	4%	1.05	1.00	55	55	
				EBR	78	0	0%	1.05	1.00	80	80	
			WB	WBL	163	1	1%	1.05	1.00	170	170	
				WBT	47	1	2%	1.05	1.00	50	50	
				WBR	6	0	0%	1.05	1.00	5	5	
			NB	NBL	70	0	0%	1.05	1.00	75	75	
				NBT	20	1	5%	1.05	1.00	20	20	
				NBR	1	0	0%	1.05	1.00	0	0	
			SB	SBL	15	0	0%	1.05	1.00	15	15	
				SBT	50	0	0%	1.05	1.00	55	50	
				SBR	1	0	0%	1.05	1.00	0	0	
								<b>TEV</b>	<b>503</b>	<b>5</b>	<b>1%</b>	
3	180	Helvetia Rd South @ West Union Rd 3 hr AM/PM Turning Movement Count Count Date: 5/25/2011 2011	EB	EBL	3	0	0%	1.05	1.00	5	5	
				EBT	1	0	0%	1.05	1.00	0	0	
				EBR	4	0	0%	1.05	1.00	5	5	
			WB	WBL	0	0	0%	1.05	1.00	0	0	
				WBT	0	0	0%	1.05	1.00	0	0	
				WBR	0	0	0%	1.05	1.00	0	0	
			NB	NBL	4	0	0%	1.05	1.00	5	5	
				NBT	88	1	1%	1.05	1.00	90	90	
				NBR	66	2	3%	1.05	1.00	70	70	
			SB	SBL	0	0	0%	1.05	1.00	0	0	
				SBT	282	0	0%	1.05	1.00	295	300	
				SBR	0	0	0%	1.05	1.00	0	0	
								<b>TEV</b>	<b>448</b>	<b>3</b>	<b>1%</b>	
4	190	Helvetia Rd @ Pubols Rd 3 hr PM Turning Movement Count Count Date: 5/25/2011 2011	EB	EBL	0	0	0%	1.05	1.00	0	0	
				EBT	0	0	0%	1.05	1.00	0	0	
				EBR	0	0	0%	1.05	1.00	0	0	
			WB	WBL	0	0	0%	1.05	1.00	0	0	
				WBT	0	0	0%	1.05	1.00	0	0	
				WBR	0	0	0%	1.05	1.00	0	0	
			NB	NBL	0	0	0%	1.05	1.00	0	0	
				NBT	0	0	0%	1.05	1.00	0	0	
				NBR	0	0	0%	1.05	1.00	0	0	
			SB	SBL	0	0	0%	1.05	1.00	0	0	
				SBT	0	0	0%	1.05	1.00	0	0	
				SBR	0	0	0%	1.05	1.00	0	0	
								<b>TEV</b>	<b>0</b>	<b>0</b>	<b>0%</b>	
5	200	Helvetia Rd @ Schaff Rd 3 hr AM/PM Turning Movement Count Count Date: 5/25/2011 2011	EB	EBL	0	0	0%	1.05	1.00	0	0	
				EBT	0	0	0%	1.05	1.00	0	0	
				EBR	0	0	0%	1.05	1.00	0	0	
			WB	WBL	3	0	0%	1.05	1.00	5	5	
				WBT	0	0	0%	1.05	1.00	0	0	
				WBR	3	1	33%	1.05	1.00	5	5	
			NB	NBL	0	0	0%	1.05	1.00	0	0	
				NBT	153	2	1%	1.05	1.00	160	145	
				NBR	1	1	100%	1.05	1.00	0	5	
			SB	SBL	2	0	0%	1.05	1.00	0	5	
				SBT	293	0	0%	1.05	1.00	310	310	
				SBR	0	0	0%	1.05	1.00	0	0	
								<b>TEV</b>	<b>455</b>	<b>4</b>	<b>1%</b>	
6	210	Helvetia Rd @ Jacobson Rd 3 hr AM/PM Turning Movement Count Count Date: 5/25/2011 2011	EB	EBL	0	0	0%	1.05	1.00	0	0	
				EBT	0	0	0%	1.05	1.00	0	0	
				EBR	4	0	0%	1.05	1.00	5	5	
			WB	WBL	193	1	1%	1.05	1.00	205	165	
				WBT	0	0	0%	1.05	1.00	0	0	
				WBR	3	1	33%	1.05	1.00	5	5	
			NB	NBL	5	0	0%	1.05	1.00	5	5	
				NBT	152	2	1%	1.05	1.00	160	145	
				NBR	219	3	1%	1.05	1.00	230	230	
			SB	SBL	10	0	0%	1.05	1.00	10	10	
				SBT	281	0	0%	1.05	1.00	295	305	
				SBR	0	0	0%	1.05	1.00	0	0	
								<b>TEV</b>	<b>867</b>	<b>7</b>	<b>1%</b>	
7	220	Brookwood Pkwy @ US26 WB Ramps 16 hr Turning Movement Count	EB	EBL	0	0	0%	1.05	1.00	0	0	
				EBT	0	0	0%	1.05	1.00	0	0	

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Int #	Synchro ID	Intersection	Direction	Movement	Existing Counts 1-Hr Volume AM Peak	Existing Heavy Vehicle Count	Existing Heavy Vehicle Percentage	Seasonal Adjustment Factor	2011 Growth Adjustment Factor	Existing ROUNDED DHW 1-Hr Volume AM Peak	Existing BALANCED DHW 1-Hr Volume AM Peak
220	Count Date: 5/25/2011 2011		WB	EBR	0	0	0%	1.05	1.00	0	0
				WBL	1260	22	2%	1.05	1.00	1325	1260
				WBT	0	0	0%	1.05	1.00	0	0
			NB	WBR	41	0	0%	1.05	1.00	45	40
				NBL	31	15	48%	1.05	1.00	35	55
				NBT	245	6	2%	1.05	1.00	255	320
			SB	NBR	0	0	0%	1.05	1.00	0	0
				SBL	0	0	0%	1.05	1.00	0	0
				SBT	386	1	0%	1.05	1.00	405	450
			TEV	SBR	26	0	0%	1.05	1.00	25	25
					<b>1989</b>	<b>44</b>	<b>2%</b>			<b>2090</b>	<b>2150</b>
			8	Brookwood Pkwy @ US26 EB Ramps 16 hr Turning Movement Count Count Date: 5/25/2011 2011		EB	EBL	61	0	0%	1.05
EBT	1	0					0%	1.05	1.00	0	0
EBR	175	21					12%	1.05	1.00	185	175
WB	WBL	0				0	0%	1.05	1.00	0	0
	WBT	0				0	0%	1.05	1.00	0	0
	WBR	0				0	0%	1.05	1.00	0	0
NB	NBL	0				0	0%	1.05	1.00	0	0
	NBT	320				21	7%	1.05	1.00	335	315
	NBR	445				19	4%	1.05	1.00	465	465
SB	SBL	36				0	0%	1.05	1.00	40	40
	SBT	1655				21	1%	1.05	1.00	1740	1670
	SBR	0				0	0%	1.05	1.00	0	0
TEV		<b>2693</b>	<b>82</b>	<b>3%</b>			<b>2830</b>	<b>2725</b>			
9	Brookwood Pkwy @ Meek Rd 3 hr AM/PM Turning Movement Count Count Date: 5/25/2011 2011		EB	EBL	16	0	0%	1.05	1.00	15	15
				EBT	3	0	0%	1.05	1.00	5	5
				EBR	19	0	0%	1.05	1.00	20	20
			WB	WBL	0	0	0%	1.05	1.00	0	0
				WBT	0	0	0%	1.05	1.00	0	0
				WBR	0	0	0%	1.05	1.00	0	0
			NB	NBL	9	0	0%	1.05	1.00	10	10
				NBT	763	36	5%	1.05	1.00	800	765
				NBR	2	0	0%	1.05	1.00	0	5
			SB	SBL	0	0	0%	1.05	1.00	0	0
				SBT	1842	46	2%	1.05	1.00	1935	1840
				SBR	6	0	0%	1.05	1.00	5	5
TEV		<b>2660</b>	<b>82</b>	<b>3%</b>			<b>2790</b>	<b>2665</b>			
10	Brookwood Pkwy @ Huffman Street 3 hr AM/PM Turning Movement Count Count Date: 5/25/2011 2011		EB	EBL	0	0	0%	1.05	1.00	0	0
				EBT	0	0	0%	1.05	1.00	0	0
				EBR	0	0	0%	1.05	1.00	0	0
			WB	WBL	2	0	0%	1.05	1.00	0	5
				WBT	0	0	0%	1.05	1.00	0	0
				WBR	38	0	0%	1.05	1.00	40	40
			NB	NBL	0	0	0%	1.05	1.00	0	0
				NBT	798	28	4%	1.05	1.00	840	740
				NBR	30	1	3%	1.05	1.00	30	30
			SB	SBL	129	1	1%	1.05	1.00	135	120
				SBT	1776	27	2%	1.05	1.00	1865	1740
				SBR	0	0	0%	1.05	1.00	0	0
TEV		<b>2773</b>	<b>57</b>	<b>2%</b>			<b>2910</b>	<b>2675</b>			
11	Brookwood Pkwy @ Genentech Access 3 hr AM/PM Turning Movement Count Count Date: 5/25/2011 2011		EB	EBL	5	0	0%	1.05	1.00	5	5
				EBT	0	0	0%	1.05	1.00	0	0
				EBR	9	1	11%	1.05	1.00	10	10
			WB	WBL	1	0	0%	1.05	1.00	0	0
				WBT	0	0	0%	1.05	1.00	0	0
				WBR	0	0	0%	1.05	1.00	0	0
			NB	NBL	23	1	4%	1.05	1.00	25	25
				NBT	750	39	5%	1.05	1.00	790	835
				NBR	10	0	0%	1.05	1.00	10	10
			SB	SBL	5	0	0%	1.05	1.00	5	5
				SBT	1547	42	3%	1.05	1.00	1625	1735
				SBR	73	1	1%	1.05	1.00	75	80
TEV		<b>2423</b>	<b>84</b>	<b>3%</b>			<b>2545</b>	<b>2705</b>			
12	Brookwood Pkwy @ Evergreen Rd 16 hr Turning Movement Count Count Date: 5/25/2011 2011		EB	EBL	186	1	1%	1.05	1.00	195	225
				EBT	373	5	1%	1.05	1.00	390	390
				EBR	84	18	21%	1.05	1.00	90	90
			WB	WBL	101	8	8%	1.05	1.00	105	105
				WBT	316	2	1%	1.05	1.00	330	330
				WBR	38	3	8%	1.05	1.00	40	50

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Int #	Synchro ID	Intersection	Direction	Movement	Existing Counts	Existing	Existing	Seasonal Adjustment	2011 Growth	Existing	Existing
					1-Hr Volume AM Peak	Heavy Vehicle Count	Heavy Vehicle Percentage			Factor	Adjustment Factor
270	AM Peak Hour: 7:30 AM-8:30 AM	AM Peak Hour Used: 7:30 AM-8:30 AM	NB	NBL	58	10	17%	1.05	1.00	60	60
				NBT	491	35	7%	1.05	1.00	515	595
				NBR	117	7	6%	1.05	1.00	125	125
			SB	SBL	62	5	8%	1.05	1.00	65	70
				SBT	803	30	4%	1.05	1.00	845	915
				SBR	666	6	1%	1.05	1.00	700	760
			TEV				3295	130	4%		
20	Century Blvd @ West Union Rd	3 hr PM Turning Movement Count	EB	EBL	0	0	0%	1.05	1.00	0	0
				EBT	0	0	0%	1.05	1.00	0	0
				EBR	0	0	0%	1.05	1.00	0	0
			WB	WBL	0	0	0%	1.05	1.00	0	0
				WBT	0	0	0%	1.05	1.00	0	0
				WBR	0	0	0%	1.05	1.00	0	0
			NB	NBL	0	0	0%	1.05	1.00	0	0
				NBT	0	0	0%	1.05	1.00	0	0
				NBR	0	0	0%	1.05	1.00	0	0
			SB	SBL	0	0	0%	1.05	1.00	0	0
				SBT	0	0	0%	1.05	1.00	0	0
				SBR	0	0	0%	1.05	1.00	0	0
			TEV				0	0	0%		
17	Century Blvd @ Jacobson Rd	3 hr AM/PM Turning Movement Count	EB	EBL	0	0	0%	1.05	1.00	0	0
				EBT	214	6	3%	1.05	1.00	225	225
				EBR	64	9	14%	1.05	1.00	65	65
			WB	WBL	13	0	0%	1.05	1.00	15	15
				WBT	203	4	2%	1.05	1.00	215	215
				WBR	0	0	0%	1.05	1.00	0	0
			NB	NBL	26	8	31%	1.05	1.00	25	25
				NBT	0	0	0%	1.05	1.00	0	0
				NBR	4	1	25%	1.05	1.00	5	5
			SB	SBL	0	0	0%	1.05	1.00	0	0
				SBT	0	0	0%	1.05	1.00	0	0
				SBR	0	0	0%	1.05	1.00	0	0
			TEV				524	28	5%		
39	Croeni Rd @ Jacobson Rd	3 hr AM/PM Turning Movement Count	EB	EBL	5	1	20%	1.05	1.00	5	5
				EBT	99	3	3%	1.05	1.00	105	105
				EBR	114	1	1%	1.05	1.00	120	120
			WB	WBL	36	0	0%	1.05	1.00	40	40
				WBT	185	2	1%	1.05	1.00	195	195
				WBR	37	2	5%	1.05	1.00	40	40
			NB	NBL	25	1	4%	1.05	1.00	25	25
				NBT	9	1	11%	1.05	1.00	10	10
				NBR	9	1	11%	1.05	1.00	10	10
			SB	SBL	8	2	25%	1.05	1.00	10	10
				SBT	20	1	5%	1.05	1.00	20	20
				SBR	3	1	33%	1.05	1.00	5	5
			TEV				550	16	3%		
15	239th Avenue @ Evergreen Pkwy	3 hr PM Turning Movement Count	EB	EBL	0	0	0%	1.05	1.00	0	0
				EBT	0	0	0%	1.05	1.00	0	0
				EBR	0	0	0%	1.05	1.00	0	0
			WB	WBL	0	0	0%	1.05	1.00	0	0
				WBT	0	0	0%	1.05	1.00	0	0
				WBR	0	0	0%	1.05	1.00	0	0
			NB	NBL	0	0	0%	1.05	1.00	0	0
				NBT	0	0	0%	1.05	1.00	0	0
				NBR	0	0	0%	1.05	1.00	0	0
			SB	SBL	0	0	0%	1.05	1.00	0	0
				SBT	0	0	0%	1.05	1.00	0	0
				SBR	0	0	0%	1.05	1.00	0	0
			TEV				0	0	0%		
38	229th Avenue @ Evergreen Pkwy	2 hr AM/PM Turning Movement Count	EB	EBL	14	0	0%	1.07	0.98	15	15
				EBT	353	20	6%	1.07	0.98	370	370
				EBR	79	1	1%	1.07	0.98	85	85
			WB	WBL	515	3	1%	1.07	0.98	540	540
				WBT	522	22	4%	1.07	0.98	545	545
				WBR	192	3	2%	1.07	0.98	200	200
			NB	NBL	99	4	4%	1.07	0.98	105	105
				NBT	67	1	1%	1.07	0.98	70	70
				NBR	254	5	2%	1.07	0.98	265	265
			SB	SBL	37	4	11%	1.07	0.98	40	40

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					1-Hr Volume AM Peak	Heavy Vehicle Count	Heavy Vehicle Percentage			Factor	Adjustment
320	PHF: 0.89		SB	SBT	26	1	4%	1.07	0.98	25	25
				SBR	7	0	0%	1.07	0.98	5	5
			TEV		2165	64	3%			2265	2265
31	330	Cornelius Pass Rd @ West Union Rd 16 hr Turning Movement Count Count Date: 5/25/2011 2011	EB	EBL	29	7	24%	1.05	1.00	30	30
				EBT	52	2	4%	1.05	1.00	55	55
				EBR	46	11	24%	1.05	1.00	50	50
			WB	WBL	493	1	0%	1.05	1.00	520	520
				WBT	146	1	1%	1.05	1.00	155	155
				WBR	14	3	21%	1.05	1.00	15	15
			NB	NBL	48	3	6%	1.05	1.00	50	50
				NBT	341	63	18%	1.05	1.00	360	360
				NBR	182	5	3%	1.05	1.00	190	190
			SB	SBL	8	1	13%	1.05	1.00	10	10
				SBT	541	50	9%	1.05	1.00	570	570
				SBR	34	2	6%	1.05	1.00	35	35
			TEV		1934	149	8%			2040	2040
32	340	Cornelius Pass Rd @ Jacobson Rd 3 hr PM Turning Movement Count Count Date: 5/25/2011 2011	EB	EBL	0	0	0%	1.05	1.00	0	0
				EBT	0	0	0%	1.05	1.00	0	0
				EBR	0	0	0%	1.05	1.00	0	0
			WB	WBL	0	0	0%	1.05	1.00	0	0
				WBT	0	0	0%	1.05	1.00	0	0
				WBR	0	0	0%	1.05	1.00	0	0
			NB	NBL	0	0	0%	1.05	1.00	0	0
				NBT	0	0	0%	1.05	1.00	0	0
				NBR	0	0	0%	1.05	1.00	0	0
			SB	SBL	0	0	0%	1.05	1.00	0	0
				SBT	0	0	0%	1.05	1.00	0	0
				SBR	0	0	0%	1.05	1.00	0	0
			TEV		0	0	0%			0	0
33	350	Cornelius Pass Rd @ Rock Creek Blvd 3 hr PM Turning Movement Count Count Date: 5/25/2011 2011	EB	EBL	0	0	0%	1.05	1.00	0	0
				EBT	0	0	0%	1.05	1.00	0	0
				EBR	0	0	0%	1.05	1.00	0	0
			WB	WBL	0	0	0%	1.05	1.00	0	0
				WBT	0	0	0%	1.05	1.00	0	0
				WBR	0	0	0%	1.05	1.00	0	0
			NB	NBL	0	0	0%	1.05	1.00	0	0
				NBT	0	0	0%	1.05	1.00	0	0
				NBR	0	0	0%	1.05	1.00	0	0
			SB	SBL	0	0	0%	1.05	1.00	0	0
				SBT	0	0	0%	1.05	1.00	0	0
				SBR	0	0	0%	1.05	1.00	0	0
			TEV		0	0	0%			0	0
35	360	Cornelius Pass Rd @ US26 WB Ramps 16 hr Turning Movement Count Count Date: 5/25/2011 2011	EB	EBL	0	0	0%	1.05	1.00	0	0
				EBT	0	0	0%	1.05	1.00	0	0
				EBR	1146	32	3%	1.05	1.00	1205	1205
			WB	WBL	0	0	0%	1.05	1.00	0	0
				WBT	0	0	0%	1.05	1.00	0	0
				WBR	218	15	7%	1.05	1.00	230	230
			NB	NBL	67	6	9%	1.05	1.00	70	70
				NBT	715	66	9%	1.05	1.00	750	750
				NBR	0	0	0%	1.05	1.00	0	0
			SB	SBL	0	0	0%	1.05	1.00	0	0
				SBT	1022	52	5%	1.05	1.00	1075	1065
				SBR	215	35	16%	1.05	1.00	225	225
			TEV		3383	206	6%			3555	3545
36	370	Cornelius Pass Rd @ US26 EB Ramps 16 hr Turning Movement Count Count Date: 5/25/2011 2011	EB	EBL	149	35	23%	1.05	1.00	155	155
				EBT	0	0	0%	1.05	1.00	0	0
				EBR	176	3	2%	1.05	1.00	185	185
			WB	WBL	0	0	0%	1.05	1.00	0	0
				WBT	0	0	0%	1.05	1.00	0	0
				WBR	0	0	0%	1.05	1.00	0	0
			NB	NBL	0	0	0%	1.05	1.00	0	0
				NBT	635	46	7%	1.05	1.00	665	665
				NBR	467	24	5%	1.05	1.00	490	490
			SB	SBL	0	0	0%	1.05	1.00	0	0
				SBT	1928	64	3%	1.05	1.00	2025	2025
				SBR	231	25	11%	1.05	1.00	245	245
			TEV		3586	197	5%			3765	3765

Project: Brookwood IAMP  
 Job #: ODOT 701  
 Subject: **AM Turning Movement Volumes**  
 Created: 6/27/2011  
 Rev. Date: 1/20/2012

Int #	Synchro ID	Intersection	Direction	Movement	Existing Counts 1-Hr Volume AM Peak	Existing Heavy Vehicle Count	Existing Heavy Vehicle Percentage	Seasonal Adjustment Factor	2011 Growth Adjustment Factor	Existing ROUNDED DHV 1-Hr Volume AM Peak	Existing BALANCED DHV 1-Hr Volume AM Peak
37	380	Cornelius Pass Rd @ Evergreen Pkwy 16 hr Turning Movement Count Count Date: 5/25/2011	EB	EBL	41	8	20%	1.05	1.00	45	45
	EBT			239	12	5%	1.05	1.00	250	250	
	EBR			31	10	32%	1.05	1.00	35	35	
	380	2011	WB	WBL	28	0	0%	1.05	1.00	30	30
	WBT			481	10	2%	1.05	1.00	505	505	
	WBR			137	2	1%	1.05	1.00	145	145	
	380	AM Peak Hour: 7:15 AM-8:15 AM AM Peak Hour Used: 7:30 AM-8:30 AM	NB	NBL	147	9	6%	1.05	1.00	155	155
	NBT			736	44	6%	1.05	1.00	775	775	
	NBR			44	1	2%	1.05	1.00	45	45	
	380	PHF: 0.85	SB	SBL	236	1	0%	1.05	1.00	250	250
	SBT			689	36	5%	1.05	1.00	725	725	
	SBR			285	13	5%	1.05	1.00	300	300	
				TEV		3094	146	5%			3260
34	390	Cornelius Pass Rd @ Wagon Way 3 hr AM/PM Turning Movement Count Count Date: 5/25/2011	EB	EBL	9	1	11%	1.05	1.00	10	10
	EBT			0	0	0%	1.05	1.00	0	0	
	EBR			55	9	16%	1.05	1.00	60	60	
	390	2011	WB	WBL	4	3	75%	1.05	1.00	5	5
	WBT			1	1	100%	1.05	1.00	0	0	
	WBR			0	0	0%	1.05	1.00	0	0	
	390	AM Peak Hour: 7:00 AM-8:00 AM AM Peak Hour Used: 7:30 AM-8:30 AM	NB	NBL	165	9	5%	1.05	1.00	175	180
	NBT			729	65	9%	1.05	1.00	765	795	
	NBR			5	0	0%	1.05	1.00	5	5	
	390	PHF: 0.88	SB	SBL	1	1	100%	1.05	1.00	0	0
	SBT			1169	75	6%	1.05	1.00	1225	1225	
	SBR			38	1	3%	1.05	1.00	40	40	
				TEV		2176	165	8%			2285

Project: Brookwood IAMP  
 Job #: ODOT 701  
 Subject: **PM Turning Movement Volumes**  
 Created: 7/7/2011  
 Rev. Date: 1/20/2012

Count #	Synchro ID	Intersection	Direction	Movement	Existing Counts	Existing	Existing	Seasonal Adjustment	2011 Growth	Existing ROUNDED	Existing BALANCED
					1-Hr Volume PM Peak	Heavy Vehicle Count	Heavy Vehicle Percentage			1-Hr Volume PM Peak	1-Hr Volume PM Peak
21	10	Jackson Sch Rd @ West Union Rd 16 hr Turning Movement Count Count Date: 5/25/2011 2011 AM Peak Hour: 4:45 PM-5:45 PM AM Peak Hour Used: 4:45 PM-5:45 PM PHF: 0.94	EB	EBL	8	0	0%	1.05	1.00	10	10
				EBT	53	1	2%	1.05	1.00	55	55
				EBR	39	0	0%	1.05	1.00	40	40
			WB	WBL	36	2	6%	1.05	1.00	40	40
				WBT	60	7	12%	1.05	1.00	65	65
				WBR	9	0	0%	1.05	1.00	10	10
			NB	NBL	62	7	11%	1.05	1.00	65	65
				NBT	36	0	0%	1.05	1.00	40	40
				NBR	56	0	0%	1.05	1.00	60	60
			SB	SBL	3	0	0%	1.05	1.00	5	5
				SBT	28	0	0%	1.05	1.00	30	30
				SBR	9	2	22%	1.05	1.00	10	10
			<b>TEV</b>					<b>399</b>	<b>19</b>	<b>5%</b>	
30	20	Jackson Quarry Rd @ West Union Rd 3 hr PM Turning Movement Count Count Date: 5/25/2011 2011 AM Peak Hour: 10:00 AM-11:00 AM AM Peak Hour Used: 4:45 PM-5:45 PM PHF: 0.94	EB	EBL	27	0	0%	1.05	1.00	30	30
				EBT	87	0	0%	1.05	1.00	90	90
				EBR	0	0	0%	1.05	1.00	0	0
			WB	WBL	0	0	0%	1.05	1.00	0	0
				WBT	72	6	8%	1.05	1.00	75	75
				WBR	9	0	0%	1.05	1.00	10	10
			NB	NBL	0	0	0%	1.05	1.00	0	0
				NBT	0	0	0%	1.05	1.00	0	0
				NBR	0	0	0%	1.05	1.00	0	0
			SB	SBL	6	0	0%	1.05	1.00	5	5
				SBT	0	0	0%	1.05	1.00	0	0
				SBR	29	2	7%	1.05	1.00	30	30
			<b>TEV</b>					<b>230</b>	<b>8</b>	<b>3%</b>	
22	30	Jackson Sch Rd @ US26 WB Ramps 16 hr Turning Movement Count Count Date: 5/25/2011 2011 AM Peak Hour: 5:00 PM-6:00 PM AM Peak Hour Used: 4:45 PM-5:45 PM PHF: 0.93	EB	EBL	0	0	0%	1.05	1.00	0	0
				EBT	0	0	0%	1.05	1.00	0	0
				EBR	0	0	0%	1.05	1.00	0	0
			WB	WBL	478	11	2%	1.05	1.00	500	500
				WBT	0	0	0%	1.05	1.00	0	0
				WBR	59	6	10%	1.05	1.00	60	60
			NB	NBL	72	0	0%	1.05	1.00	75	75
				NBT	93	2	2%	1.05	1.00	100	100
				NBR	0	0	0%	1.05	1.00	0	0
			SB	SBL	0	0	0%	1.05	1.00	0	0
				SBT	98	3	3%	1.05	1.00	105	105
				SBR	2	0	0%	1.05	1.00	0	0
			<b>TEV</b>					<b>802</b>	<b>22</b>	<b>3%</b>	
23	40	Jackson Sch Rd @ US26 EB Ramps 16 hr Turning Movement Count Count Date: 5/25/2011 2011 AM Peak Hour: 4:30 PM-5:30 PM AM Peak Hour Used: 4:45 PM-5:45 PM PHF: 0.93	EB	EBL	7	0	0%	1.05	1.00	5	5
				EBT	1	0	0%	1.05	1.00	0	0
				EBR	26	0	0%	1.05	1.00	25	25
			WB	WBL	0	0	0%	1.05	1.00	0	0
				WBT	0	0	0%	1.05	1.00	0	0
				WBR	0	0	0%	1.05	1.00	0	0
			NB	NBL	0	0	0%	1.05	1.00	0	0
				NBT	151	2	1%	1.05	1.00	160	170
				NBR	539	4	1%	1.05	1.00	565	565
			SB	SBL	41	0	0%	1.05	1.00	45	45
				SBT	531	10	2%	1.05	1.00	560	560
				SBR	0	0	0%	1.05	1.00	0	0
			<b>TEV</b>					<b>1296</b>	<b>16</b>	<b>1%</b>	
24	50	Jackson Sch Rd @ Scotch Church Rd 2 hr PM Turning Movement Count Count Date: 10/19/2010 2010 AM Peak Hour: 4:45 PM-5:45 PM AM Peak Hour Used: 4:45 PM-5:45 PM PHF: 0.88	EB	EBL	88	0	0%	1.07	0.98	90	115
				EBT	0	0	0%	1.07	0.98	0	0
				EBR	22	1	5%	1.07	0.98	25	20
			WB	WBL	0	0	0%	1.07	0.98	0	0
				WBT	0	0	0%	1.07	0.98	0	0
				WBR	0	0	0%	1.07	0.98	0	0
			NB	NBL	30	0	0%	1.07	0.98	30	25
				NBT	645	5	1%	1.07	0.98	675	620
				NBR	0	0	0%	1.07	0.98	0	0
			SB	SBL	0	0	0%	1.07	0.98	0	0
				SBT	400	10	3%	1.07	0.98	420	435
				SBR	123	5	4%	1.07	0.98	130	140
			<b>TEV</b>					<b>1308</b>	<b>21</b>	<b>2%</b>	
25	60	Jackson Sch Rd @ Meek Rd 3 hr AM/2 hr PM Turning Movement Count Count Date: 5/25/2011 2011	EB	EBL	0	0	0%	1.05	1.00	0	0
				EBT	0	0	0%	1.05	1.00	0	0
				EBR	0	0	0%	1.05	1.00	0	0
			WB	WBL	2	0	0%	1.05	1.00	0	0

Project: Brookwood IAMP  
 Job #: ODOT 701  
 Subject: **PM Turning Movement Volumes**  
 Created: 7/7/2011  
 Rev. Date: 1/20/2012

Count #	Synchro ID	Intersection	Direction	Movement	Existing Counts	Existing	Existing	Seasonal Adjustment	2011 Growth	Existing	Existing			
					1-Hr Volume PM Peak	Heavy Vehicle Count	Heavy Vehicle Percentage			Factor	Adjustment Factor	ROUNDED DHV 1-Hr Volume PM Peak	BALANCED DHV 1-Hr Volume PM Peak	
60	AM Peak Hour: 4:45 PM-5:45 PM	AM Peak Hour Used: 4:45 PM-5:45 PM	WB	WBT	0	0	0%	1.05	1.00	0	0			
				WBR	13	0	0%	1.05	1.00	15	15			
				EBR	0	0	0%	1.05	1.00	0	0			
			NB	NBL	0	0	0%	1.05	1.00	0	0			
				NBT	576	9	2%	1.05	1.00	605	630			
				NBR	7	0	0%	1.05	1.00	5	5			
			SB	SBL	12	1	8%	1.05	1.00	15	20			
				SBT	384	12	3%	1.05	1.00	405	435			
				SBR	0	0	0%	1.05	1.00	0	0			
			<b>TEV</b>					<b>994</b>	<b>22</b>	<b>2%</b>			<b>1045</b>	<b>1105</b>
26	AM Peak Hour: 5:00 PM-6:00 PM	AM Peak Hour Used: 4:45 PM-5:45 PM	EB	EBL	301	3	1%	1.05	1.00	315	315			
				EBT	344	12	3%	1.05	1.00	360	360			
				EBR	1	0	0%	1.05	1.00	0	0			
			WB	WBL	11	0	0%	1.05	1.00	10	10			
				WBT	669	10	1%	1.05	1.00	700	700			
				WBR	303	2	1%	1.05	1.00	320	320			
			NB	NBL	5	0	0%	1.05	1.00	5	5			
				NBT	1	0	0%	1.05	1.00	0	0			
				NBR	8	0	0%	1.05	1.00	10	10			
			SB	SBL	92	2	2%	1.05	1.00	95	95			
				SBT	6	0	0%	1.05	1.00	5	5			
				SBR	305	8	3%	1.05	1.00	320	320			
			<b>TEV</b>					<b>2046</b>	<b>37</b>	<b>2%</b>			<b>2140</b>	<b>2140</b>
			27	AM Peak Hour: 4:45 PM-5:45 PM	AM Peak Hour Used: 4:45 PM-5:45 PM	EB	EBL	0	0	0%	1.07	0.98	0	0
EBT	328	3					1%	1.07	0.98	345	345			
EBR	77	1					1%	1.07	0.98	80	80			
WB	WBL	224				2	1%	1.07	0.98	235	235			
	WBT	692				4	1%	1.07	0.98	725	725			
	WBR	0				0	0%	1.07	0.98	0	0			
NB	NBL	285				3	1%	1.07	0.98	300	300			
	NBT	0				0	0%	1.07	0.98	0	0			
	NBR	395				0	0%	1.07	0.98	415	415			
SB	SBL	0				0	0%	1.07	0.98	0	0			
	SBT	0				0	0%	1.07	0.98	0	0			
	SBR	0				0	0%	1.07	0.98	0	0			
<b>TEV</b>						<b>2001</b>	<b>13</b>	<b>1%</b>			<b>2100</b>	<b>2100</b>		
28	AM Peak Hour: 5:00 PM-6:00 PM	AM Peak Hour Used: 4:45 PM-5:45 PM				EB	EBL	0	0	0%	1.11	1.00	0	0
			EBT	659	5		1%	1.11	1.00	730	675			
			EBR	78	2		3%	1.11	1.00	85	85			
			WB	WBL	129	5	4%	1.11	1.00	145	145			
				WBT	715	9	1%	1.11	1.00	795	755			
				WBR	0	0	0%	1.11	1.00	0	0			
			NB	NBL	177	2	1%	1.11	1.00	195	205			
				NBT	0	0	0%	1.11	1.00	0	0			
				NBR	686	5	1%	1.11	1.00	760	730			
			SB	SBL	0	0	0%	1.11	1.00	0	0			
				SBT	0	0	0%	1.11	1.00	0	0			
				SBR	0	0	0%	1.11	1.00	0	0			
			<b>TEV</b>					<b>2444</b>	<b>28</b>	<b>1%</b>			<b>2710</b>	<b>2595</b>
			29	AM Peak Hour: 4:15 PM-5:15 PM	AM Peak Hour Used: 4:45 PM-5:45 PM	EB	EBL	1	0	0%	1.05	1.00	0	0
EBT	1340	18					1%	1.05	1.00	1405	1405			
EBR	0	0					0%	1.05	1.00	0	0			
WB	WBL	0				0	0%	1.05	1.00	0	0			
	WBT	858				16	2%	1.05	1.00	900	900			
	WBR	5				0	0%	1.05	1.00	5	5			
NB	NBL	0				0	0%	1.05	1.00	0	0			
	NBT	0				0	0%	1.05	1.00	0	0			
	NBR	0				0	0%	1.05	1.00	0	0			
SB	SBL	3				0	0%	1.05	1.00	5	5			
	SBT	0				0	0%	1.05	1.00	0	0			
	SBR	2				0	0%	1.05	1.00	0	0			
<b>TEV</b>						<b>2209</b>	<b>34</b>	<b>2%</b>			<b>2315</b>	<b>2315</b>		
19	AM Peak Hour: 4:15 PM-5:15 PM	AM Peak Hour Used: 4:45 PM-5:45 PM				EB	EBL	3	0	0%	1.05	1.00	5	5
			EBT	87	0		0%	1.05	1.00	90	90			
			EBR	1	0		0%	1.05	1.00	0	0			
			WB	WBL	0	0	0%	1.05	1.00	0	0			
				WBT	79	7	9%	1.05	1.00	85	85			
				WBR	2	0	0%	1.05	1.00	0	5			
			NB	NBL	0	0	0%	1.05	1.00	0	0			
				NBT	0	0	0%	1.05	1.00	0	0			
				NBR	0	0	0%	1.05	1.00	0	0			

Project: Brookwood IAMP  
 Job #: ODOT 701  
 Subject: **PM Turning Movement Volumes**  
 Created: 7/7/2011  
 Rev. Date: 1/20/2012

Count #	Synchro ID	Intersection	Direction	Movement	Existing Counts	Existing Heavy Vehicle	Existing Heavy Vehicle	Seasonal Adjustment	2011 Growth	Existing ROUNDED	Existing BALANCED				
					1-Hr Volume PM Peak	Count	Percentage			1-Hr Volume PM Peak	1-Hr Volume PM Peak				
110	PHF: 0.95			NBR	1	0	0%	1.05	1.00	0	0				
				SBL	1	0	0%	1.05	1.00	0	0				
				SB	SBT	1	0	0%	1.05	1.00	0	0			
				SBR	3	0	0%	1.05	1.00	5	5				
				TEV	178	7	4%			185	190				
18	Groveland Rd @ Groveland Drive 3 hr PM Turning Movement Count Count Date: 5/25/2011 2011 AM Peak Hour: 4:45 PM-5:45 PM AM Peak Hour Used: 4:45 PM-5:45 PM PHF: 0.63			EBL	0	0	0%	1.05	1.00	0	0				
				EBT	5	0	0%	1.05	1.00	5	10				
				EBR	0	0	0%	1.05	1.00	0	0				
				WB	WBL	0	0	0%	1.05	1.00	0	0			
					WBT	1	0	0%	1.05	1.00	0	10			
					WBR	2	0	0%	1.05	1.00	0	0			
				NB	NBL	0	0	0%	1.05	1.00	0	0			
					NBT	0	0	0%	1.05	1.00	0	0			
					NBR	0	0	0%	1.05	1.00	0	0			
				SB	SBL	2	0	0%	1.05	1.00	0	0			
					SBT	0	0	0%	1.05	1.00	0	0			
					SBR	0	0	0%	1.05	1.00	0	0			
				TEV	10	0	0%			5	20				
				16	Sewell Rd @ Meek Rd 3 hr PM Turning Movement Count Count Date: 5/25/2011 2011 AM Peak Hour: 4:30 PM-5:30 PM AM Peak Hour Used: 4:45 PM-5:45 PM PHF: 0.88			EBL	0	0	0%	1.05	1.00	0	0
								EBT	11	0	0%	1.05	1.00	10	10
EBR	6	0	0%					1.05	1.00	5	5				
WB	WBL	4	0					0%	1.05	1.00	5	5			
	WBT	24	2					8%	1.05	1.00	25	25			
	WBR	0	0					0%	1.05	1.00	0	0			
NB	NBL	9	1					11%	1.05	1.00	10	10			
	NBT	0	0					0%	1.05	1.00	0	0			
	NBR	6	0					0%	1.05	1.00	5	5			
SB	SBL	0	0					0%	1.05	1.00	0	0			
	SBT	0	0					0%	1.05	1.00	0	0			
	SBR	0	0					0%	1.05	1.00	0	0			
TEV	60	3	5%							60	60				
13	Sewell Rd @ Evergreen Rd 2 hr AM/PM Turning Movement Count Count Date: 03/21/2007 2007 AM Peak Hour: 5:00 PM-6:00 PM AM Peak Hour Used: 4:45 PM-5:45 PM PHF: 0.88							EBL	9	0	0%	1.11	1.00	10	10
								EBT	1311	10	1%	1.11	1.00	1455	1395
				EBR	4	0	0%	1.11	1.00	5	5				
				WB	WBL	3	0	0%	1.11	1.00	5	5			
					WBT	842	13	2%	1.11	1.00	935	900			
					WBR	9	0	0%	1.11	1.00	10	10			
				NB	NBL	1	0	0%	1.11	1.00	0	0			
					NBT	0	0	0%	1.11	1.00	0	0			
					NBR	2	0	0%	1.11	1.00	0	0			
				SB	SBL	5	0	0%	1.11	1.00	5	5			
					SBT	0	0	0%	1.11	1.00	0	0			
					SBR	6	0	0%	1.11	1.00	5	5			
				TEV	2192	23	1%			2430	2335				
				14	Meier-Jurgen Rd @ Evergreen Rd 3 hr PM Turning Movement Count Count Date: 5/25/2011 2011 AM Peak Hour: 5:00 PM-6:00 PM AM Peak Hour Used: 4:45 PM-5:45 PM PHF: 0.88			EBL	1	0	0%	1.05	1.00	0	0
								EBT	1295	16	1%	1.05	1.00	1360	1360
EBR	28	0	0%					1.05	1.00	30	30				
WB	WBL	42	1					2%	1.05	1.00	45	45			
	WBT	847	17					2%	1.05	1.00	890	890			
	WBR	4	0					0%	1.05	1.00	5	5			
NB	NBL	8	0					0%	1.05	1.00	10	10			
	NBT	0	0					0%	1.05	1.00	0	0			
	NBR	57	1					2%	1.05	1.00	60	60			
SB	SBL	1	0					0%	1.05	1.00	0	0			
	SBT	0	0					0%	1.05	1.00	0	0			
	SBR	0	0					0%	1.05	1.00	0	0			
TEV	2283	35	2%							2400	2400				
1	Helvetia Rd North @ West Union Rd 3 hr AM/PM Turning Movement Count Count Date: 5/25/2011 2011 AM Peak Hour: 4:45 PM-5:45 PM AM Peak Hour Used: 4:45 PM-5:45 PM PHF: 0.82							EBL	14	0	0%	1.05	1.00	15	15
								EBT	0	0	0%	1.05	1.00	0	0
				EBR	0	0	0%	1.05	1.00	0	0				
				WB	WBL	0	0	0%	1.05	1.00	0	0			
					WBT	0	0	0%	1.05	1.00	0	0			
					WBR	0	0	0%	1.05	1.00	0	0			
				NB	NBL	3	0	0%	1.05	1.00	5	5			
					NBT	128	0	0%	1.05	1.00	135	135			
					NBR	0	0	0%	1.05	1.00	0	0			
				SB	SBL	0	0	0%	1.05	1.00	0	0			
					SBT	57	0	0%	1.05	1.00	60	60			
					SBR	5	0	0%	1.05	1.00	5	5			

Project: Brookwood IAMP  
 Job #: ODOT 701  
 Subject: **PM Turning Movement Volumes**  
 Created: 7/7/2011  
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Count #	Synchro ID	Intersection	Direction	Movement	Existing Counts	Existing	Existing	Seasonal Adjustment	2011 Growth	Existing	Existing	
					1-Hr Volume PM Peak	Heavy Vehicle Count	Heavy Vehicle Percentage			Adjustment Factor	Adjustment Factor	ROUNDED DHV 1-Hr Volume PM Peak
					TEV	207	0	0%			220	220
2	170	Helvetia Rd Middle @ West Union Rd	EB	EBL	1	0	0%	1.05	1.00	0	0	
	170	16 hr Turning Movement Count		EBT	65	0	0%	1.05	1.00	70	70	
	170	Count Date: 5/25/2011		EBR	13	0	0%	1.05	1.00	15	15	
	170	2011	WB	WBL	81	0	0%	1.05	1.00	85	85	
	170			WBT	69	2	3%	1.05	1.00	70	70	
	170			WBR	19	0	0%	1.05	1.00	20	20	
	170	AM Peak Hour: 4:45 PM-5:45 PM	NB	NBL	35	0	0%	1.05	1.00	35	35	
	170	AM Peak Hour Used: 4:45 PM-5:45 PM		NBT	115	0	0%	1.05	1.00	120	120	
	170			NBR	5	0	0%	1.05	1.00	5	5	
	170		SB	SBL	14	0	0%	1.05	1.00	15	15	
	170	PHF:		SBT	44	0	0%	1.05	1.00	45	45	
	170	0.92		SBR	0	0	0%	1.05	1.00	0	0	
						TEV	461	2	0%		480	480
3	180	Helvetia Rd South @ West Union Rd	EB	EBL	1	0	0%	1.05	1.00	0	0	
	180	3 hr AM/PM Turning Movement Count		EBT	1	0	0%	1.05	1.00	0	0	
	180	Count Date: 5/25/2011		EBR	11	0	0%	1.05	1.00	10	10	
	180	2011	WB	WBL	0	0	0%	1.05	1.00	0	0	
	180			WBT	0	0	0%	1.05	1.00	0	0	
	180			WBR	0	0	0%	1.05	1.00	0	0	
	180	AM Peak Hour: 4:45 PM-5:45 PM	NB	NBL	32	0	0%	1.05	1.00	35	35	
	180	AM Peak Hour Used: 4:45 PM-5:45 PM		NBT	151	0	0%	1.05	1.00	160	160	
	180			NBR	257	0	0%	1.05	1.00	270	270	
	180		SB	SBL	2	0	0%	1.05	1.00	0	0	
	180	PHF:		SBT	127	0	0%	1.05	1.00	135	135	
	180	0.92		SBR	13	0	0%	1.05	1.00	15	10	
						TEV	595	0	0%		625	620
4	190	Helvetia Rd @ Pubols Rd	EB	EBL	0	0	0%	1.05	1.00	0	0	
	190	3 hr PM Turning Movement Count		EBT	0	0	0%	1.05	1.00	0	0	
	190	Count Date: 5/25/2011		EBR	0	0	0%	1.05	1.00	0	0	
	190	2011	WB	WBL	3	0	0%	1.05	1.00	5	5	
	190			WBT	0	0	0%	1.05	1.00	0	0	
	190			WBR	0	0	0%	1.05	1.00	0	0	
	190	AM Peak Hour: 10:00 AM-11:00 AM	NB	NBL	0	0	0%	1.05	1.00	0	0	
	190	AM Peak Hour Used: 4:45 PM-5:45 PM		NBT	436	3	1%	1.05	1.00	460	465	
	190			NBR	7	0	0%	1.05	1.00	5	5	
	190		SB	SBL	0	0	0%	1.05	1.00	0	0	
	190	PHF:		SBT	142	2	1%	1.05	1.00	150	145	
	190	0.97		SBR	0	0	0%	1.05	1.00	0	0	
						TEV	588	5	1%		620	620
5	200	Helvetia Rd @ Schaff Rd	EB	EBL	0	0	0%	1.05	1.00	0	0	
	200	3 hr AM/PM Turning Movement Count		EBT	0	0	0%	1.05	1.00	0	0	
	200	Count Date: 5/25/2011		EBR	0	0	0%	1.05	1.00	0	0	
	200	2011	WB	WBL	2	0	0%	1.05	1.00	0	0	
	200			WBT	0	0	0%	1.05	1.00	0	0	
	200			WBR	0	0	0%	1.05	1.00	0	0	
	200	AM Peak Hour: 4:30 PM-5:30 PM	NB	NBL	0	0	0%	1.05	1.00	0	0	
	200	AM Peak Hour Used: 4:45 PM-5:45 PM		NBT	433	0	0%	1.05	1.00	455	450	
	200			NBR	2	0	0%	1.05	1.00	0	0	
	200		SB	SBL	0	0	0%	1.05	1.00	0	0	
	200	PHF:		SBT	139	0	0%	1.05	1.00	145	130	
	200	0.93		SBR	0	0	0%	1.05	1.00	0	0	
						TEV	576	0	0%		600	580
6	210	Helvetia Rd @ Jacobson Rd	EB	EBL	1	0	0%	1.05	1.00	0	0	
	210	3 hr AM/PM Turning Movement Count		EBT	0	0	0%	1.05	1.00	0	0	
	210	Count Date: 5/25/2011		EBR	10	0	0%	1.05	1.00	10	15	
	210	2011	WB	WBL	161	1	1%	1.05	1.00	170	170	
	210			WBT	1	0	0%	1.05	1.00	0	0	
	210			WBR	5	0	0%	1.05	1.00	5	5	
	210	AM Peak Hour: 4:30 PM-5:30 PM	NB	NBL	9	0	0%	1.05	1.00	10	10	
	210	AM Peak Hour Used: 4:45 PM-5:45 PM		NBT	432	0	0%	1.05	1.00	455	445	
	210			NBR	478	5	1%	1.05	1.00	500	455	
	210		SB	SBL	5	0	0%	1.05	1.00	5	5	
	210	PHF:		SBT	132	0	0%	1.05	1.00	140	125	
	210	0.91		SBR	1	0	0%	1.05	1.00	0	0	
						TEV	1235	6	0%		1295	1230
7	220	Brookwood Pkwy @ US26 WB Ramps	EB	EBL	0	0	0%	1.05	1.00	0	0	
	220	16 hr Turning Movement Count		EBT	0	0	0%	1.05	1.00	0	0	

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Count #	Synchro ID	Intersection	Direction	Movement	Existing Counts	Existing Heavy Vehicle	Existing Heavy Vehicle	Seasonal Adjustment	2011 Growth	Existing ROUNDED	Existing BALANCED
					1-Hr Volume PM Peak	Count	Percentage			1-Hr Volume PM Peak	1-Hr Volume PM Peak
220	Count Date: 5/25/2011 2011		WB	EBR	0	0	0%	1.05	1.00	0	0
				WBL	589	1	0%	1.05	1.00	620	625
				WBT	2	0	0%	1.05	1.00	0	0
			NB	WBR	77	0	0%	1.05	1.00	80	55
				NBL	205	3	1%	1.05	1.00	215	190
				NBT	841	5	1%	1.05	1.00	885	855
			SB	NBR	0	0	0%	1.05	1.00	0	0
				SBL	0	0	0%	1.05	1.00	0	0
				SBT	240	0	0%	1.05	1.00	250	235
			TEV				61	0	0%	1.05	1.00
TEV				2015	9	0%			2115	2035	
8	Brookwood Pkwy @ US26 EB Ramps 16 hr Turning Movement Count Count Date: 5/25/2011 2011		EB	EBL	65	0	0%	1.05	1.00	70	60
				EBT	1	0	0%	1.05	1.00	0	0
				EBR	58	0	0%	1.05	1.00	60	60
			WB	WBL	0	0	0%	1.05	1.00	0	0
				WBT	0	0	0%	1.05	1.00	0	0
				WBR	0	0	0%	1.05	1.00	0	0
			NB	NBL	0	0	0%	1.05	1.00	0	0
				NBT	975	8	1%	1.05	1.00	1025	985
				NBR	744	5	1%	1.05	1.00	780	780
			SB	SBL	19	0	0%	1.05	1.00	20	15
SBT	855	2		0%	1.05	1.00	900	845			
SBR	0	0		0%	1.05	1.00	0	0			
TEV				2717	15	1%			2855	2745	
9	Brookwood Pkwy @ Meek Rd 3 hr AM/PM Turning Movement Count Count Date: 5/25/2011 2011		EB	EBL	4	0	0%	1.05	1.00	5	5
				EBT	0	0	0%	1.05	1.00	0	0
				EBR	16	0	0%	1.05	1.00	15	15
			WB	WBL	2	0	0%	1.05	1.00	0	0
				WBT	0	0	0%	1.05	1.00	0	0
				WBR	0	0	0%	1.05	1.00	0	0
			NB	NBL	25	0	0%	1.05	1.00	25	35
				NBT	1713	13	1%	1.05	1.00	1800	1760
				NBR	0	0	0%	1.05	1.00	0	0
			SB	SBL	0	0	0%	1.05	1.00	0	0
SBT	894	2		0%	1.05	1.00	940	890			
SBR	12	0		0%	1.05	1.00	15	15			
TEV				2666	15	1%			2800	2720	
10	Brookwood Pkwy @ Huffman Street 3 hr AM/PM Turning Movement Count Count Date: 5/25/2011 2011		EB	EBL	0	0	0%	1.05	1.00	0	0
				EBT	0	0	0%	1.05	1.00	0	0
				EBR	0	0	0%	1.05	1.00	0	0
			WB	WBL	9	0	0%	1.05	1.00	10	10
				WBT	0	0	0%	1.05	1.00	0	0
				WBR	126	4	3%	1.05	1.00	130	130
			NB	NBL	0	0	0%	1.05	1.00	0	0
				NBT	1637	9	1%	1.05	1.00	1720	1700
				NBR	12	0	0%	1.05	1.00	15	15
			SB	SBL	27	0	0%	1.05	1.00	30	30
SBT	873	1		0%	1.05	1.00	915	915			
SBR	0	0		0%	1.05	1.00	0	0			
TEV				2684	14	1%			2820	2800	
11	Brookwood Pkwy @ Genentech Access 3 hr AM/PM Turning Movement Count Count Date: 5/25/2011 2011		EB	EBL	60	0	0%	1.05	1.00	65	65
				EBT	0	0	0%	1.05	1.00	0	0
				EBR	31	0	0%	1.05	1.00	35	35
			WB	WBL	5	0	0%	1.05	1.00	5	5
				WBT	0	0	0%	1.05	1.00	0	0
				WBR	9	0	0%	1.05	1.00	10	10
			NB	NBL	4	0	0%	1.05	1.00	5	5
				NBT	1603	9	1%	1.05	1.00	1685	1640
				NBR	2	0	0%	1.05	1.00	0	0
			SB	SBL	1	0	0%	1.05	1.00	0	0
SBT	888	1		0%	1.05	1.00	930	925			
SBR	1	0		0%	1.05	1.00	0	0			
TEV				2604	10	0%			2735	2685	
12	Brookwood Pkwy @ Evergreen Rd 16 hr Turning Movement Count Count Date: 5/25/2011 2011		EB	EBL	544	3	1%	1.05	1.00	570	600
				EBT	561	2	0%	1.05	1.00	590	590
				EBR	107	7	7%	1.05	1.00	110	110
			WB	WBL	163	0	0%	1.05	1.00	170	170
WBT	466	2		0%	1.05	1.00	490	490			
WBR	81	0		0%	1.05	1.00	85	115			

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Count #	Synchro ID	Intersection	Direction	Movement	Existing Counts	Existing	Existing	Seasonal Adjustment	2011 Growth	Existing	Existing	
					1-Hr Volume PM Peak	Heavy Vehicle Count	Heavy Vehicle Percentage			Adjustment Factor	Adjustment Factor	ROUNDED DHV 1-Hr Volume PM Peak
270	AM Peak Hour: 5:00 PM-6:00 PM	AM Peak Hour Used: 4:45 PM-5:45 PM	NB	NBL	96	3	3%	1.05	1.00	100	100	
				NBT	845	6	1%	1.05	1.00	885	930	
				NBR	91	1	1%	1.05	1.00	95	95	
			SB	SBL	47	0	0%	1.05	1.00	50	65	
				SBT	621	1	0%	1.05	1.00	650	670	
				SBR	209	0	0%	1.05	1.00	220	230	
			TEV				<b>3831</b>	<b>25</b>	<b>1%</b>			<b>4015</b>
20	Century Blvd @ West Union Rd	3 hr PM Turning Movement Count	EB	EBL	3	1	33%	1.05	1.00	5	5	
				EBT	335	2	1%	1.05	1.00	350	350	
				EBR	3	0	0%	1.05	1.00	5	5	
			WB	WBL	4	1	25%	1.05	1.00	5	5	
				WBT	147	4	3%	1.05	1.00	155	155	
				WBR	10	2	20%	1.05	1.00	10	10	
			NB	NBL	11	0	0%	1.05	1.00	10	10	
				NBT	2	0	0%	1.05	1.00	0	0	
				NBR	10	0	0%	1.05	1.00	10	10	
			SB	SBL	14	0	0%	1.05	1.00	15	15	
				SBT	1	0	0%	1.05	1.00	0	0	
				SBR	6	0	0%	1.05	1.00	5	5	
			TEV				<b>546</b>	<b>10</b>	<b>2%</b>			<b>570</b>
17	Century Blvd @ Jacobson Rd	3 hr AM/PM Turning Movement Count	EB	EBL	0	0	0%	1.05	1.00	0	0	
				EBT	437	9	2%	1.05	1.00	460	470	
				EBR	28	3	11%	1.05	1.00	30	30	
			WB	WBL	8	4	50%	1.05	1.00	10	10	
				WBT	95	3	3%	1.05	1.00	100	100	
				WBR	0	0	0%	1.05	1.00	0	0	
			NB	NBL	36	1	3%	1.05	1.00	40	40	
				NBT	0	0	0%	1.05	1.00	0	0	
				NBR	12	1	8%	1.05	1.00	15	15	
			SB	SBL	0	0	0%	1.05	1.00	0	0	
				SBT	0	0	0%	1.05	1.00	0	0	
				SBR	0	0	0%	1.05	1.00	0	0	
			TEV				<b>616</b>	<b>21</b>	<b>3%</b>			<b>655</b>
39	Croeni Rd @ Jacobson Rd	3 hr AM/PM Turning Movement Count	EB	EBL	4	0	0%	1.05	1.00	5	5	
				EBT	424	12	3%	1.05	1.00	445	450	
				EBR	38	0	0%	1.05	1.00	40	40	
			WB	WBL	7	0	0%	1.05	1.00	5	5	
				WBT	78	7	9%	1.05	1.00	80	80	
				WBR	7	1	14%	1.05	1.00	5	5	
			NB	NBL	28	0	0%	1.05	1.00	30	30	
				NBT	7	0	0%	1.05	1.00	5	5	
				NBR	11	0	0%	1.05	1.00	10	20	
			SB	SBL	30	1	3%	1.05	1.00	30	40	
				SBT	15	0	0%	1.05	1.00	15	15	
				SBR	7	2	29%	1.05	1.00	5	5	
			TEV				<b>656</b>	<b>23</b>	<b>4%</b>			<b>675</b>
15	239th Avenue @ Evergreen Pkwy	3 hr PM Turning Movement Count	EB	EBL	15	1	7%	1.05	1.00	15	15	
				EBT	835	8	1%	1.05	1.00	875	875	
				EBR	6	0	0%	1.05	1.00	5	5	
			WB	WBL	5	0	0%	1.05	1.00	5	5	
				WBT	719	12	2%	1.05	1.00	755	755	
				WBR	11	0	0%	1.05	1.00	10	10	
			NB	NBL	24	4	17%	1.05	1.00	25	25	
				NBT	5	0	0%	1.05	1.00	5	5	
				NBR	38	1	3%	1.05	1.00	40	40	
			SB	SBL	31	2	6%	1.05	1.00	35	35	
				SBT	1	0	0%	1.05	1.00	0	0	
				SBR	58	0	0%	1.05	1.00	60	60	
			TEV				<b>1748</b>	<b>28</b>	<b>2%</b>			<b>1830</b>
38	229th Avenue @ Evergreen Pkwy	2 hr AM/PM Turning Movement Count	EB	EBL	9	0	0%	1.07	1.00	10	10	
				EBT	738	7	1%	1.07	1.00	790	790	
				EBR	103	0	0%	1.07	1.00	110	110	
			WB	WBL	206	3	1%	1.07	1.00	220	220	
				WBT	520	5	1%	1.07	1.00	555	555	
				WBR	64	3	5%	1.07	1.00	70	70	
			NB	NBL	78	0	0%	1.07	1.00	85	85	
				NBT	36	2	6%	1.07	1.00	40	40	
				NBR	587	6	1%	1.07	1.00	630	630	
			SB	SBL	160	6	4%	1.07	1.00	170	170	
				SBT								
				SBR								
			TEV									

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Count #	Synchro ID	Intersection	Direction	Movement	Existing Counts	Existing	Existing	Seasonal Adjustment	2011 Growth	Existing	Existing	
					1-Hr Volume PM Peak	Heavy Vehicle Count	Heavy Vehicle Percentage			Adjustment Factor	Adjustment Factor	ROUNDED DHV 1-Hr Volume PM Peak
320	PHF: 0.94		SB	SBT	52	0	0%	1.07	1.00	55	55	
				SBR	10	0	0%	1.07	1.00	10	10	
			TEV		2563	32	1%			2745	2745	
31	330	Cornelius Pass Rd @ West Union Rd 16 hr Turning Movement Count Count Date: 5/25/2011 2011	EB	EBL	108	3	3%	1.05	1.00	115	115	
				EBT	184	0	0%	1.05	1.00	195	195	
				EBR	79	2	3%	1.05	1.00	85	95	
	330	AM Peak Hour: 4:45 PM-5:45 PM AM Peak Hour Used: 4:45 PM-5:45 PM	WB	WBL	205	5	2%	1.05	1.00	215	225	
				WBT	72	6	8%	1.05	1.00	75	75	
				WBR	17	1	6%	1.05	1.00	20	20	
	330	AM Peak Hour: 4:45 PM-5:45 PM AM Peak Hour Used: 4:45 PM-5:45 PM	NB	NBL	52	7	13%	1.05	1.00	55	60	
				NBT	797	28	4%	1.05	1.00	835	850	
				NBR	640	1	0%	1.05	1.00	670	680	
	330	PHF: 0.97		SB	SBT	24	2	8%	1.05	1.00	25	25
					SBR	360	26	7%	1.05	1.00	380	395
				TEV		2567	81	3%			2700	2765
	340	340	Cornelius Pass Rd @ Jacobson Rd 3 hr PM Turning Movement Count Count Date: 5/25/2011 2011	EB	EBL	317	6	2%	1.05	1.00	335	335
EBT					27	0	0%	1.05	1.00	30	30	
EBR					151	3	2%	1.05	1.00	160	180	
340		AM Peak Hour: 4:45 PM-5:45 PM AM Peak Hour Used: 4:45 PM-5:45 PM	WB	WBL	21	0	0%	1.05	1.00	20	30	
				WBT	7	0	0%	1.05	1.00	5	5	
				WBR	5	0	0%	1.05	1.00	5	5	
340		AM Peak Hour: 4:45 PM-5:45 PM AM Peak Hour Used: 4:45 PM-5:45 PM	NB	NBL	31	3	10%	1.05	1.00	35	40	
				NBT	1189	26	2%	1.05	1.00	1250	1250	
				NBR	51	0	0%	1.05	1.00	55	60	
340		PHF: 0.92		SB	SBL	9	0	0%	1.05	1.00	10	10
					SBT	592	23	4%	1.05	1.00	620	650
				SBR	52	3	6%	1.05	1.00	55	55	
TEV			2452	64	3%			2580	2650			
350	350	Cornelius Pass Rd @ Rock Creek Blvd 3 hr PM Turning Movement Count Count Date: 5/25/2011 2011	EB	EBL	0	0	0%	1.05	1.00	0	0	
				EBT	0	0	0%	1.05	1.00	0	0	
				EBR	0	0	0%	1.05	1.00	0	0	
	350	AM Peak Hour: 4:45 PM-5:45 PM AM Peak Hour Used: 4:45 PM-5:45 PM	WB	WBL	136	6	4%	1.05	1.00	145	145	
				WBT	0	0	0%	1.05	1.00	0	0	
				WBR	23	1	4%	1.05	1.00	25	25	
	350	AM Peak Hour: 4:45 PM-5:45 PM AM Peak Hour Used: 4:45 PM-5:45 PM	NB	NBL	0	0	0%	1.05	1.00	0	0	
				NBT	1260	35	3%	1.05	1.00	1325	1325	
				NBR	328	2	1%	1.05	1.00	345	345	
	350	PHF: 0.91		SB	SBL	56	0	0%	1.05	1.00	60	60
					SBT	767	37	5%	1.05	1.00	805	810
				SBR	0	0	0%	1.05	1.00	0	0	
	TEV		2570	81	3%			2705	2710			
360	360	Cornelius Pass Rd @ US26 WB Ramps 16 hr Turning Movement Count Count Date: 5/25/2011 2011	EB	EBL	0	0	0%	1.05	1.00	0	0	
				EBT	0	0	0%	1.05	1.00	0	0	
				EBR	665	14	2%	1.05	1.00	700	700	
	360	AM Peak Hour: 4:30 PM-5:30 PM AM Peak Hour Used: 4:45 PM-5:45 PM	WB	WBL	0	0	0%	1.05	1.00	0	0	
				WBT	0	0	0%	1.05	1.00	0	0	
				WBR2	287	13	5%	1.05	1.00	300	300	
	360	AM Peak Hour: 4:30 PM-5:30 PM AM Peak Hour Used: 4:45 PM-5:45 PM	NB	NBL	258	5	2%	1.05	1.00	270	270	
				NBT	1452	27	2%	1.05	1.00	1525	1550	
				NBR	0	0	0%	1.05	1.00	0	0	
	360	PHF: 0.97		SB	SBL	0	0	0%	1.05	1.00	0	0
					SBT	947	26	3%	1.05	1.00	995	995
				SBR	172	14	8%	1.05	1.00	180	180	
	TEV		3781	99	3%			3970	3995			
370	370	Cornelius Pass Rd @ US26 EB Ramps 16 hr Turning Movement Count Count Date: 5/25/2011 2011	EB	EBL	155	8	5%	1.05	1.00	165	165	
				EBT	0	0	0%	1.05	1.00	0	0	
				EBR	117	5	4%	1.05	1.00	125	125	
	370	AM Peak Hour: 4:30 PM-5:30 PM AM Peak Hour Used: 4:45 PM-5:45 PM	WB	WBL	0	0	0%	1.05	1.00	0	0	
				WBT	0	0	0%	1.05	1.00	0	0	
				WBR	0	0	0%	1.05	1.00	0	0	
	370	AM Peak Hour: 4:30 PM-5:30 PM AM Peak Hour Used: 4:45 PM-5:45 PM	NB	NBL	0	0	0%	1.05	1.00	0	0	
				NBT	1601	25	2%	1.05	1.00	1680	1655	
				NBR	876	17	2%	1.05	1.00	920	920	
	370	PHF: 0.97		SB	SBL	0	0	0%	1.05	1.00	0	0
					SBT	1352	31	2%	1.05	1.00	1420	1395
				SBR	287	14	5%	1.05	1.00	300	300	
	TEV		4388	100	2%			4610	4560			

Project: Brookwood IAMP  
 Job #: ODOT 701  
 Subject: **PM Turning Movement Volumes**  
 Created: 7/7/2011  
 Rev. Date: 1/20/2012

Count #	Synchro ID	Intersection	Direction	Movement	Existing Counts	Existing	Existing	Seasonal Adjustment	2011 Growth	Existing ROUNDED	Existing BALANCED			
					1-Hr Volume PM Peak	Heavy Vehicle Count	Heavy Vehicle Percentage			1-Hr Volume PM Peak	1-Hr Volume PM Peak			
37	380	Cornelius Pass Rd @ Evergreen Pkwy 16 hr Turning Movement Count Count Date: 5/25/2011 2011 AM Peak Hour: 4:45 PM-5:45 PM AM Peak Hour Used: 4:45 PM-5:45 PM PHF: 0.96	EB	EBL	363	4	1%	1.05	1.00	380	380			
				EBT	821	2	0%	1.05	1.00	860	860			
				EBR	151	3	2%	1.05	1.00	160	160			
			WB	WBL	76	1	1%	1.05	1.00	80	80			
				WBT	340	3	1%	1.05	1.00	355	355			
				WBR	392	6	2%	1.05	1.00	410	410			
			NB	NBL	54	1	2%	1.05	1.00	55	55			
				NBT	1020	24	2%	1.05	1.00	1070	1070			
			SBL	SBL	218	6	3%	1.05	1.00	230	230			
				SBT	937	16	2%	1.05	1.00	985	985			
			SBR	SBR	22	1	5%	1.05	1.00	25	25			
			TEV					4469	67	1%			4690	4690
			34	390	Cornelius Pass Rd @ Wagon Way 3 hr AM/PM Turning Movement Count Count Date: 5/25/2011 2011 AM Peak Hour: 4:30 PM-5:30 PM AM Peak Hour Used: 4:45 PM-5:45 PM PHF: 0.95	EB	EBL	29	0	0%	1.05	1.00	30	30
EBT	1	0					0%	1.05	1.00	0	0			
EBR	226	9					4%	1.05	1.00	235	245			
WB	WBL	6				1	17%	1.05	1.00	5	5			
	WBT	0				0	0%	1.05	1.00	0	0			
	WBR	1				0	0%	1.05	1.00	0	0			
NB	NBL	181				4	2%	1.05	1.00	190	205			
	NBT	1549				37	2%	1.05	1.00	1625	1640			
SBL	SBL	4				1	25%	1.05	1.00	5	5			
	SBT	1				0	0%	1.05	1.00	0	0			
SBR	SBR	859				36	4%	1.05	1.00	900	925			
SBR	SBR	30				1	3%	1.05	1.00	30	30			
TEV								2887	89	3%			3020	3085

## **Appendix D-4. ADT Development**



<b>Bi-Directional</b>		
<b>Road</b>	<b>Volumes</b>	<b>Calculated ADT*</b>
<b>West Union</b>		<b>4942</b>
West of Jackson School Rd	245	2450
East of Jackson School Rd	235	2350
West of Helvetia Rd	215	2150
East of Helvetia Rd	445	4450
West of Cornelius Pass Rd	605	6050
East of Cornelius Pass Rd	1220	12200
<b>Evergreen</b>		<b>17817</b>
West of Jackson School Rd	1700	17000
East of Jackson School Rd	1495	14950
West of Brookwood Pkwy	2120	21200
East of Brookwood Pkwy	1525	15250
West of Cornelius Pass Rd	1835	18350
East of Cornelius Pass Rd	2015	20150
<b>Jackson School Road</b>		<b>6320</b>
North of West Union	105	1050
South of West Union	275	2750
North of Ramps	267	2670
Between Ramps	780	7800
South of Ramps	1310	13100
North of Evergreen	1055	10550
<b>Helvetia</b>	<b>828.5</b>	<b>8285</b>
North of West Union	215	2150
South of West Union	610	6100
North of Ramps	584	5840
Ramps	1905	19050
<b>Brookwood</b>		<b>25065</b>
South of Ramps	2701	27010
South of Huffman	2640	26400
North of Evergreen	2610	26100
South of Evergreen	2075	20750
<b>Cornelius Pass Road</b>		<b>26650</b>
North of West Union	1435	14350
South of West Union	2305	23050
North of Wagon Way	2625	26250
South of Ramps	4095	40950
North of Evergreen	3100	31000
South of Evergreen	2430	24300
<b>25th</b>	1165	11650
<b>Jacobson</b>	640	6400

\*ADT Calculated using a K-factor of 10%. ADT = peak hour bi-directional volume/.10



# Appendix E. Traffic Operations Analysis



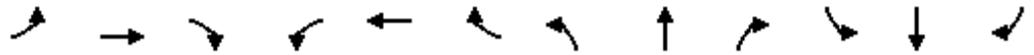
## **Appendix E-1. Intersection Operations and Queuing**



# AM Operations

HCM Unsignalized Intersection Capacity Analysis  
 10: West Union Rd & Jackson School Rd

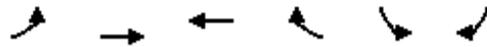
2/3/2012



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Volume (veh/h)	0	45	35	35	35	0	20	15	20	5	45	5
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79
Hourly flow rate (vph)	0	57	44	44	44	0	25	19	25	6	57	6
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	44			101			247	212	79	222	234	44
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	44			101			247	212	79	222	234	44
tC, single (s)	4.6			4.2			7.2	6.6	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.7			2.3			3.5	4.1	3.3	3.5	4.0	3.3
p0 queue free %	100			97			96	97	97	99	91	99
cM capacity (veh/h)	1305			1448			635	646	973	687	649	1031
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>WB 1</b>	<b>NB 1</b>	<b>SB 1</b>								
Volume Total	101	89	70	70								
Volume Left	0	44	25	6								
Volume Right	44	0	25	6								
cSH	1305	1448	731	675								
Volume to Capacity	0.00	0.03	0.10	0.10								
Queue Length 95th (ft)	0	2	8	9								
Control Delay (s)	0.0	3.9	10.4	10.9								
Lane LOS		A	B	B								
Approach Delay (s)	0.0	3.9	10.4	10.9								
Approach LOS			B	B								
<b>Intersection Summary</b>												
Average Delay			5.6									
Intersection Capacity Utilization			25.3%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis  
 20: West Union Rd & Jackson Quarry Rd

2/3/2012



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↔	↔		↔	
Volume (veh/h)	0	0	0	0	0	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	0	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	0				0	0
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	0				0	0
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	1623				1023	1085

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

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

HCM Unsignalized Intersection Capacity Analysis  
 30: US-26 WB JS Rd On-ramp & Jackson School Rd

2/3/2012

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	370	2	25	35	40	0	0	110	2
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Hourly flow rate (vph)	0	0	0	425	2	29	40	46	0	0	126	2
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)						23						
Median type							None			None		
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	254	253	126	253	253	46	126				46	
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	254	253	126	253	253	46	126				46	
tC, single (s)	7.1	6.5	6.2	7.2	6.5	6.3	4.2				4.1	
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.4	2.3				2.2	
p0 queue free %	100	100	100	37	100	97	97				100	
cM capacity (veh/h)	667	636	929	679	636	1004	1435				1575	
<b>Direction, Lane #</b>	<b>WB 1</b>	<b>NB 1</b>	<b>NB 2</b>	<b>SB 1</b>	<b>SB 2</b>							
Volume Total	456	40	46	126	2							
Volume Left	425	40	0	0	0							
Volume Right	29	0	0	0	2							
cSH	725	1435	1700	1700	1700							
Volume to Capacity	0.63	0.03	0.03	0.07	0.00							
Queue Length 95th (ft)	112	2	0	0	0							
Control Delay (s)	18.2	7.6	0.0	0.0	0.0							
Lane LOS	C	A										
Approach Delay (s)	18.2	3.5	0.0									
Approach LOS	C											
<b>Intersection Summary</b>												
Average Delay			12.8									
Intersection Capacity Utilization			51.3%		ICU Level of Service		A					
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis  
 40: US-26 EB JS Rd Off-ramp & Jackson School Rd

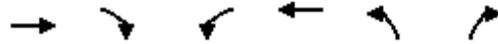
2/3/2012

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	5	2	80	0	0	0	0	70	560	55	425	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Hourly flow rate (vph)	6	2	93	0	0	0	0	81	651	64	494	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)			11									
Median type								TWLTL				None
Median storage (veh)								2				
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	703	703	494	705	703	81	494			81		
vC1, stage 1 conf vol	622	622		81	81							
vC2, stage 2 conf vol	81	81		623	622							
vCu, unblocked vol	703	703	494	705	703	81	494			81		
tC, single (s)	7.4	6.5	6.2	7.1	6.5	6.2	4.1			4.2		
tC, 2 stage (s)	6.4	5.5		6.1	5.5							
tF (s)	3.8	4.0	3.3	3.5	4.0	3.3	2.2			2.3		
p0 queue free %	99	99	84	100	100	100	100			96		
cM capacity (veh/h)	394	444	573	370	445	984	1080			1467		
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>NB 1</b>	<b>NB 2</b>	<b>SB 1</b>	<b>SB 2</b>							
Volume Total	101	81	651	64	494							
Volume Left	6	0	0	64	0							
Volume Right	93	0	651	0	0							
cSH	623	1700	1700	1467	1700							
Volume to Capacity	0.16	0.05	0.38	0.04	0.29							
Queue Length 95th (ft)	14	0	0	3	0							
Control Delay (s)	12.6	0.0	0.0	7.6	0.0							
Lane LOS	B			A								
Approach Delay (s)	12.6	0.0		0.9								
Approach LOS	B											
<b>Intersection Summary</b>												
Average Delay			1.3									
Intersection Capacity Utilization			51.3%		ICU Level of Service					A		
Analysis Period (min)			15									

# HCM Signalized Intersection Capacity Analysis

## 41: US-26 EB JS Rd On-ramp &

2/3/2012



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑					
Volume (vph)	615	0	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0					
Lane Util. Factor	0.95					
Frt	1.00					
Flt Protected	1.00					
Satd. Flow (prot)	3374					
Flt Permitted	1.00					
Satd. Flow (perm)	3374					
Peak-hour factor, PHF	0.86	0.86	0.86	0.86	0.86	0.86
Adj. Flow (vph)	715	0	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	715	0	0	0	0	0
Heavy Vehicles (%)	7%	0%	0%	0%	0%	0%
Turn Type						
Protected Phases	4					
Permitted Phases						
Actuated Green, G (s)	20.0					
Effective Green, g (s)	20.0					
Actuated g/C Ratio	1.00					
Clearance Time (s)	4.0					
Lane Grp Cap (vph)	3374					
v/s Ratio Prot	c0.21					
v/s Ratio Perm						
v/c Ratio	0.21					
Uniform Delay, d1	0.0					
Progression Factor	1.00					
Incremental Delay, d2	0.1					
Delay (s)	0.1					
Level of Service	A					
Approach Delay (s)	0.1			0.0	0.0	
Approach LOS	A			A	A	
<b>Intersection Summary</b>						
HCM Average Control Delay			0.1		HCM Level of Service	A
HCM Volume to Capacity ratio			0.21			
Actuated Cycle Length (s)			20.0		Sum of lost time (s)	0.0
Intersection Capacity Utilization			20.3%		ICU Level of Service	A
Analysis Period (min)			15			
c Critical Lane Group						

HCM Unsignalized Intersection Capacity Analysis  
 50: Scotch Church Rd & Jackson School Rd

2/3/2012



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	0	0	0	0	0	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	0	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	0	0	0			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	0	0	0			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	100			
cM capacity (veh/h)	1023	1085	1623			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	0	0	0
Volume Left	0	0	0
Volume Right	0	0	0
cSH	1700	1700	1700
Volume to Capacity	0.00	0.00	0.00
Queue Length 95th (ft)	0	0	0
Control Delay (s)	0.0	0.0	0.0
Lane LOS	A		
Approach Delay (s)	0.0	0.0	0.0
Approach LOS	A		

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

HCM Unsignalized Intersection Capacity Analysis  
 60: Meek Rd & Jackson School Rd

2/3/2012



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	5	10	445	5	15	455
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86
Hourly flow rate (vph)	6	12	517	6	17	529
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1084	520			523	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1084	520			523	
tC, single (s)	6.4	6.2			4.4	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.4	
p0 queue free %	98	98			98	
cM capacity (veh/h)	238	560			936	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	17	523	547
Volume Left	6	0	17
Volume Right	12	6	0
cSH	386	1700	936
Volume to Capacity	0.05	0.31	0.02
Queue Length 95th (ft)	4	0	1
Control Delay (s)	14.8	0.0	0.5
Lane LOS	B		A
Approach Delay (s)	14.8	0.0	0.5
Approach LOS	B		

Intersection Summary			
Average Delay		0.5	
Intersection Capacity Utilization	46.1%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Signalized Intersection Capacity Analysis  
70: Evergreen Pkwy & Jackson School Rd

2/3/2012



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	375	590	2	5	215	90	2	5	5	160	2	300
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.1	4.7		4.8	4.7	4.7		5.2			5.6	5.6
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00		1.00			1.00	1.00
Frt	1.00	1.00		1.00	1.00	0.85		0.94			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.99			0.95	1.00
Satd. Flow (prot)	1752	1809		1805	1743	1583		1777			1758	1599
Flt Permitted	0.95	1.00		0.95	1.00	1.00		0.94			0.72	1.00
Satd. Flow (perm)	1752	1809		1805	1743	1583		1686			1326	1599
Peak-hour factor, PHF	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Adj. Flow (vph)	431	678	2	6	247	103	2	6	6	184	2	345
RTOR Reduction (vph)	0	0	0	0	0	67	0	5	0	0	0	278
Lane Group Flow (vph)	431	680	0	6	247	36	0	9	0	0	186	67
Heavy Vehicles (%)	3%	5%	0%	0%	9%	2%	0%	0%	0%	3%	0%	1%
Turn Type	Prot			Prot		Perm	Perm			Perm		Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases						6	8			4		4
Actuated Green, G (s)	8.7	26.1		1.0	18.1	18.1		9.9			9.5	9.5
Effective Green, g (s)	10.1	27.5		2.4	19.5	19.5		11.3			10.9	10.9
Actuated g/C Ratio	0.18	0.49		0.04	0.35	0.35		0.20			0.19	0.19
Clearance Time (s)	6.5	6.1		6.2	6.1	6.1		6.6			7.0	7.0
Vehicle Extension (s)	2.6	3.2		2.7	3.2	3.2		1.8			1.8	1.8
Lane Grp Cap (vph)	317	890		77	608	552		341			259	312
v/s Ratio Prot	c0.25	c0.38		0.00	0.14							
v/s Ratio Perm						0.02		0.01			c0.14	0.04
v/c Ratio	1.36	0.76		0.08	0.41	0.07		0.03			0.72	0.22
Uniform Delay, d1	22.9	11.6		25.7	13.8	12.1		17.9			21.1	18.9
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00			1.00	1.00
Incremental Delay, d2	181.0	4.0		0.4	0.5	0.1		0.0			7.7	0.1
Delay (s)	203.9	15.5		26.1	14.3	12.2		17.9			28.7	19.0
Level of Service	F	B		C	B	B		B			C	B
Approach Delay (s)		88.6			13.9			17.9			22.4	
Approach LOS		F			B			B			C	

Intersection Summary

HCM Average Control Delay	57.4	HCM Level of Service	E
HCM Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	55.9	Sum of lost time (s)	10.7
Intersection Capacity Utilization	63.6%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

# HCM Signalized Intersection Capacity Analysis

## 80: Evergreen Pkwy & 15th Ave

2/3/2012



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↵	↑↑	↵	↵
Volume (vph)	550	205	335	265	95	190
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.8		5.3	4.8	6.1	6.1
Lane Util. Factor	0.95		1.00	0.95	1.00	1.00
Frt	0.96		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	3356		1787	3312	1719	1599
Flt Permitted	1.00		0.95	1.00	0.95	1.00
Satd. Flow (perm)	3356		1787	3312	1719	1599
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	618	230	376	298	107	213
RTOR Reduction (vph)	64	0	0	0	0	179
Lane Group Flow (vph)	784	0	376	298	107	34
Heavy Vehicles (%)	4%	1%	1%	9%	5%	1%
Turn Type			Prot			Perm
Protected Phases	2		1	6	8	
Permitted Phases						8
Actuated Green, G (s)	18.8		13.6	39.1	9.1	9.1
Effective Green, g (s)	20.2		15.0	40.5	9.6	9.6
Actuated g/C Ratio	0.33		0.25	0.66	0.16	0.16
Clearance Time (s)	6.2		6.7	6.2	6.6	6.6
Vehicle Extension (s)	3.2		2.6	3.2	2.0	2.0
Lane Grp Cap (vph)	1111		439	2199	271	252
v/s Ratio Prot	c0.23		c0.21	0.09	c0.06	
v/s Ratio Perm						0.02
v/c Ratio	0.71		0.86	0.14	0.39	0.13
Uniform Delay, d1	17.8		22.0	3.8	23.1	22.1
Progression Factor	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	2.1		14.9	0.0	0.3	0.1
Delay (s)	19.9		36.9	3.8	23.4	22.2
Level of Service	B		D	A	C	C
Approach Delay (s)	19.9			22.3	22.6	
Approach LOS	B			C	C	

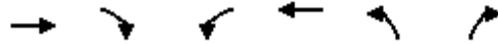
### Intersection Summary

HCM Average Control Delay	21.2	HCM Level of Service	C
HCM Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	61.0	Sum of lost time (s)	16.2
Intersection Capacity Utilization	58.7%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis  
 90: Evergreen Pkwy & 25th Ave

2/3/2012



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↖↗	↑↑	↖	↗↘
Volume (vph)	630	110	540	540	60	160
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.1		6.0	5.1	5.9	6.0
Lane Util. Factor	0.95		0.97	0.95	1.00	0.88
Frt	0.98		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	3465		3400	3505	1656	2682
Flt Permitted	1.00		0.95	1.00	0.95	1.00
Satd. Flow (perm)	3465		3400	3505	1656	2682
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	708	124	607	607	67	180
RTOR Reduction (vph)	17	0	0	0	0	53
Lane Group Flow (vph)	815	0	607	607	67	127
Heavy Vehicles (%)	2%	1%	3%	3%	9%	6%
Turn Type			Prot		custom	
Protected Phases	2		1	6	3	
Permitted Phases						1 8
Actuated Green, G (s)	20.1		15.3	42.8	8.3	30.9
Effective Green, g (s)	21.5		16.7	44.2	9.7	27.2
Actuated g/C Ratio	0.33		0.26	0.68	0.15	0.42
Clearance Time (s)	6.5		7.4	6.5	7.3	
Vehicle Extension (s)	3.2		2.3	3.2	2.3	
Lane Grp Cap (vph)	1148		875	2387	248	1124
v/s Ratio Prot	c0.24		c0.18	0.17	c0.04	
v/s Ratio Perm						0.05
v/c Ratio	0.71		0.69	0.25	0.27	0.11
Uniform Delay, d1	19.0		21.8	4.0	24.5	11.5
Progression Factor	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	2.1		2.1	0.1	0.3	0.0
Delay (s)	21.0		23.9	4.1	24.8	11.5
Level of Service	C		C	A	C	B
Approach Delay (s)	21.0			14.0	15.1	
Approach LOS	C			B	B	

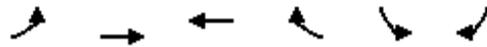
**Intersection Summary**

HCM Average Control Delay	16.7	HCM Level of Service	B
HCM Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	64.9	Sum of lost time (s)	17.0
Intersection Capacity Utilization	53.9%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis  
 100: Evergreen Pkwy & Eggiman Rd/273rd Ave

2/3/2012



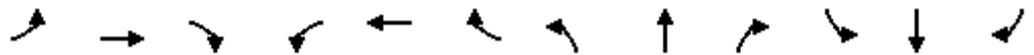
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	0	0	0	0	0	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	0	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None TWLTL					
Median storage veh	2					
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	0				0	0
vC1, stage 1 conf vol					0	
vC2, stage 2 conf vol					0	
vCu, unblocked vol	0				0	0
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)					5.4	
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	1623				1023	1085

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

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

HCM Unsignalized Intersection Capacity Analysis  
 110: West Union Rd & Groveland Rd

2/3/2012



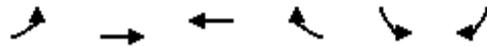
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Volume (veh/h)	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	0			0			0	0	0	0	0	0
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	0			0			0	0	0	0	0	0
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	100	100	100	100
cM capacity (veh/h)	1623			1623			1023	896	1085	1023	896	1085

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

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

HCM Unsignalized Intersection Capacity Analysis  
 120: Groveland Dr & Groveland Rd

2/3/2012



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↖	↗		↘	
Volume (veh/h)	0	0	0	0	0	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	0	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	0				0	0
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	0				0	0
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	1623				1023	1085

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

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

HCM Unsignalized Intersection Capacity Analysis  
 130: Meek Rd & Sewell Rd

2/3/2012



Movement	WBL	WBR	NBL	NBR	SEL	SER
Lane Configurations	W		W		W	
Volume (veh/h)	0	0	0	0	0	0
Sign Control	Free		Stop		Free	
Grade	0%		0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	0	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None				None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	0		0	0		
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	0		0	0		
tC, single (s)	4.1		6.4	6.2		
tC, 2 stage (s)						
tF (s)	2.2		3.5	3.3		
p0 queue free %	100		100	100		
cM capacity (veh/h)	1623		1023	1085		

Direction, Lane #	WB 1	NB 1	SE 1
Volume Total	0	0	0
Volume Left	0	0	0
Volume Right	0	0	0
cSH	1700	1700	1700
Volume to Capacity	0.00	0.00	0.00
Queue Length 95th (ft)	0	0	0
Control Delay (s)	0.0	0.0	0.0
Lane LOS		A	
Approach Delay (s)	0.0	0.0	0.0
Approach LOS		A	

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

HCM Unsignalized Intersection Capacity Analysis  
 140: Evergreen Pkwy & Sewell Rd

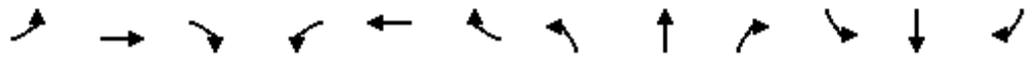
2/3/2012



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	10	780	0	0	1015	5	0	0	0	5	0	10
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	12	918	0	0	1194	6	0	0	0	6	0	12
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												14
Median type		TWLTL			TWLTL							
Median storage (veh)		2			2							
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1200			918			2141	2141	918	2138	2138	1197
vC1, stage 1 conf vol							941	941		1197	1197	
vC2, stage 2 conf vol							1200	1200		941	941	
vCu, unblocked vol	1200			918			2141	2141	918	2138	2138	1197
tC, single (s)	4.5			5.1			7.6	6.5	7.2	7.5	7.5	6.4
tC, 2 stage (s)							6.6	5.5		6.5	6.5	
tF (s)	2.5			3.1			4.0	4.0	4.2	3.9	4.9	3.5
p0 queue free %	98			100			100	100	100	96	100	94
cM capacity (veh/h)	472			458			132	199	223	151	135	208
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>EB 2</b>	<b>WB 1</b>	<b>WB 2</b>	<b>NB 1</b>	<b>SB 1</b>						
Volume Total	12	918	0	1200	0	18						
Volume Left	12	0	0	0	0	6						
Volume Right	0	0	0	6	0	12						
cSH	472	1700	1700	1700	1700	312						
Volume to Capacity	0.02	0.54	0.00	0.71	0.00	0.06						
Queue Length 95th (ft)	2	0	0	0	0	4						
Control Delay (s)	12.8	0.0	0.0	0.0	0.0	25.5						
Lane LOS	B				A	D						
Approach Delay (s)	0.2		0.0		0.0	25.5						
Approach LOS					A	D						
<b>Intersection Summary</b>												
Average Delay			0.3									
Intersection Capacity Utilization			63.7%		ICU Level of Service				B			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis  
 150: Evergreen Pkwy & 253rd Ave/Meier-Jurgen Rd

2/3/2012



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↕		↖	↕			↕			↕	
Volume (veh/h)	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		TWLTL			TWLTL							
Median storage veh		2			2							
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	0			0			0	0	0	0	0	0
vC1, stage 1 conf vol							0	0		0	0	
vC2, stage 2 conf vol							0	0		0	0	
vCu, unblocked vol	0			0			0	0	0	0	0	0
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)							6.5	5.5		6.5	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	100	100	100	100
cM capacity (veh/h)	1622			1622			1023	896	1084	1023	896	1084

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total	0	0	0	0	0	0	0	0
Volume Left	0	0	0	0	0	0	0	0
Volume Right	0	0	0	0	0	0	0	0
cSH	1700	1700	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Queue Length 95th (ft)	0	0	0	0	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS							A	A
Approach Delay (s)	0.0			0.0			0.0	0.0
Approach LOS							A	A

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

HCM Unsignalized Intersection Capacity Analysis  
 151: Evergreen Pkwy & Dawson Cr

2/3/2012



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↵	↑↑	↵	↵
Volume (veh/h)	0	0	0	0	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	0	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWLTL			None		
Median storage veh	2					
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	0			0	0	
vC1, stage 1 conf vol				0		
vC2, stage 2 conf vol				0		
vCu, unblocked vol	0			0	0	
tC, single (s)	4.1			6.8	6.9	
tC, 2 stage (s)				5.8		
tF (s)	2.2			3.5	3.3	
p0 queue free %	100			100	100	
cM capacity (veh/h)	1622			1023	1084	

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1	NB 2
Volume Total	0	0	0	0	0	0	0
Volume Left	0	0	0	0	0	0	0
Volume Right	0	0	0	0	0	0	0
cSH	1700	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Queue Length 95th (ft)	0	0	0	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS						A	A
Approach Delay (s)	0.0		0.0			0.0	
Approach LOS						A	

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

HCM Unsignalized Intersection Capacity Analysis  
 160: West Union Rd & Helvetia Rd

2/3/2012



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	10	0	0	25	65	20
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.74	0.74	0.74	0.74	0.74	0.74
Hourly flow rate (vph)	14	0	0	34	88	27
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	135	101	115			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	135	101	115			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	98	100	100			
cM capacity (veh/h)	863	959	1487			
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>NB 1</b>	<b>SB 1</b>			
Volume Total	14	34	115			
Volume Left	14	0	0			
Volume Right	0	0	27			
cSH	863	1487	1700			
Volume to Capacity	0.02	0.00	0.07			
Queue Length 95th (ft)	1	0	0			
Control Delay (s)	9.2	0.0	0.0			
Lane LOS	A					
Approach Delay (s)	9.2	0.0	0.0			
Approach LOS	A					
<b>Intersection Summary</b>						
Average Delay			0.8			
Intersection Capacity Utilization			14.6%	ICU Level of Service	A	
Analysis Period (min)			15			

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Intersection Sign configuration not allowed in HCM analysis.

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HCM Unsignalized Intersection Capacity Analysis  
 170: Helvetia Rd & West Union Rd

2/3/2012

												
Movement	NBL	NBT	NBR	SBL	SBT	SBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	75	20	0	15	50	0	0	55	80	170	50	5
Peak Hour Factor	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71
Hourly flow rate (vph)	106	28	0	21	70	0	0	77	113	239	70	7
Direction, Lane #	NB 1	SB 1	SE 1	NW 1								
Volume Total (vph)	134	92	190	317								
Volume Left (vph)	106	21	0	239								
Volume Right (vph)	0	0	113	7								
Hadj (s)	0.18	0.05	-0.33	0.16								
Departure Headway (s)	5.5	5.4	4.6	4.9								
Degree Utilization, x	0.20	0.14	0.24	0.43								
Capacity (veh/h)	587	591	721	696								
Control Delay (s)	9.9	9.3	9.1	11.7								
Approach Delay (s)	9.9	9.3	9.1	11.7								
Approach LOS	A	A	A	B								
Intersection Summary												
Delay			10.4									
HCM Level of Service			B									
Intersection Capacity Utilization			42.0%	ICU Level of Service	A							
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis  
 180: West Union Rd & Helvetia Rd

2/3/2012



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔						↕			↕	
Volume (veh/h)	5	0	5	0	0	0	5	90	70	0	300	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70
Hourly flow rate (vph)	7	0	7	0	0	0	7	129	100	0	429	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	621	671	429	629	621	179	429			229		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	621	671	429	629	621	179	429			229		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	98	100	99	100	100	100	99			100		
cM capacity (veh/h)	400	378	631	392	403	870	1142			1351		

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	14	236	429
Volume Left	7	7	0
Volume Right	7	100	0
cSH	490	1142	1351
Volume to Capacity	0.03	0.01	0.00
Queue Length 95th (ft)	2	0	0
Control Delay (s)	12.6	0.3	0.0
Lane LOS	B	A	
Approach Delay (s)	12.6	0.3	0.0
Approach LOS	B		

Intersection Summary		
Average Delay		0.4
Intersection Capacity Utilization	25.8%	ICU Level of Service
Analysis Period (min)		15
		A

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Intersection Sign configuration not allowed in HCM analysis.

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HCM Unsignalized Intersection Capacity Analysis  
 190: Pubols Rd & Helvetia Rd

2/3/2012



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	0	0	0	0	0	0
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	0	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	0	0			0	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	0	0			0	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	1023	1085			1623	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	0	0	0
Volume Left	0	0	0
Volume Right	0	0	0
cSH	1700	1700	1700
Volume to Capacity	0.00	0.00	0.00
Queue Length 95th (ft)	0	0	0
Control Delay (s)	0.0	0.0	0.0
Lane LOS	A		
Approach Delay (s)	0.0	0.0	0.0
Approach LOS	A		

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

# HCM Unsignalized Intersection Capacity Analysis

## 200: Schaaf Rd & Helvetia Rd

2/3/2012



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	5	5	145	5	5	310
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.64	0.64	0.64	0.64	0.64	0.64
Hourly flow rate (vph)	8	8	227	8	8	484
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	730	230			234	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	730	230			234	
tC, single (s)	6.4	6.5			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.6			2.2	
p0 queue free %	98	99			99	
cM capacity (veh/h)	390	738			1345	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	16	234	492
Volume Left	8	0	8
Volume Right	8	8	0
cSH	510	1700	1345
Volume to Capacity	0.03	0.14	0.01
Queue Length 95th (ft)	2	0	0
Control Delay (s)	12.3	0.0	0.2
Lane LOS	B		A
Approach Delay (s)	12.3	0.0	0.2
Approach LOS	B		

Intersection Summary			
Average Delay		0.4	
Intersection Capacity Utilization		30.3%	ICU Level of Service A
Analysis Period (min)		15	

# HCM Unsignalized Intersection Capacity Analysis

## 210: Groveland Dr & Helvetia Rd

2/3/2012



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Volume (veh/h)	2	2	5	165	2	5	5	145	210	10	305	2
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79
Hourly flow rate (vph)	3	3	6	209	3	6	6	184	266	13	386	3
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								TWLTL				None
Median storage (veh)								2				
Upstream signal (ft)								305				
pX, platoon unblocked	0.87	0.87		0.87	0.87	0.87				0.87		
vC, conflicting volume	749	875	387	749	743	316	389			449		
vC1, stage 1 conf vol	413	413		329	329							
vC2, stage 2 conf vol	337	462		420	414							
vCu, unblocked vol	634	779	387	634	627	135	389			288		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.5	4.1			4.1		
tC, 2 stage (s)	6.1	5.5		6.1	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.6	2.2			2.2		
p0 queue free %	100	99	99	60	100	99	99			99		
cM capacity (veh/h)	533	466	665	527	514	726	1181			1114		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	11	218	456	401
Volume Left	3	209	6	13
Volume Right	6	6	266	3
cSH	578	531	1181	1114
Volume to Capacity	0.02	0.41	0.01	0.01
Queue Length 95th (ft)	2	50	0	1
Control Delay (s)	11.3	16.4	0.2	0.4
Lane LOS	B	C	A	A
Approach Delay (s)	11.3	16.4	0.2	0.4
Approach LOS	B	C		

Intersection Summary			
Average Delay		3.6	
Intersection Capacity Utilization	45.6%		ICU Level of Service A
Analysis Period (min)		15	

# HCM Signalized Intersection Capacity Analysis

## 220: US-26 WB Helvetia On-ramp & Helvetia Rd

2/3/2012



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↖	↖	↖	↖	↑			↗	↗
Volume (vph)	0	0	0	1260	2	40	55	320	0	0	450	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				3.6	3.6	3.6	2.0	3.0			3.0	
Lane Util. Factor				0.95	0.95	1.00	1.00	1.00			0.95	
Fr <sub>t</sub>				1.00	1.00	0.85	1.00	1.00			0.99	
Fl <sub>t</sub> Protected				0.95	0.95	1.00	0.95	1.00			1.00	
Satd. Flow (prot)				1681	1686	1615	1421	1863			3581	
Fl <sub>t</sub> Permitted				0.95	0.95	1.00	0.95	1.00			1.00	
Satd. Flow (perm)				1681	1686	1615	1421	1863			3581	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	0	0	0	1355	2	43	59	344	0	0	484	27
RTOR Reduction (vph)	0	0	0	0	0	7	0	0	0	0	5	0
Lane Group Flow (vph)	0	0	0	677	680	36	59	344	0	0	506	0
Heavy Vehicles (%)	0%	0%	0%	2%	0%	0%	27%	2%	0%	0%	0%	0%
Turn Type				Perm		Perm		Prot				
Protected Phases					4			1	6			2
Permitted Phases				4		4						
Actuated Green, G (s)				32.7	32.7	32.7	4.3	27.3			19.0	
Effective Green, g (s)				34.1	34.1	34.1	6.3	29.3			21.0	
Actuated g/C Ratio				0.49	0.49	0.49	0.09	0.42			0.30	
Clearance Time (s)				5.0	5.0	5.0	4.0	5.0			5.0	
Vehicle Extension (s)				2.3	2.3	2.3	2.3	3.0			5.2	
Lane Grp Cap (vph)				819	821	787	128	780			1074	
v/s Ratio Prot							c0.04	c0.18			0.14	
v/s Ratio Perm				0.40	0.40	0.02						
v/c Ratio				0.83	0.83	0.05	0.46	0.44			0.47	
Uniform Delay, d <sub>1</sub>				15.4	15.4	9.4	30.2	14.5			20.0	
Progression Factor				1.00	1.00	1.00	0.92	0.89			1.00	
Incremental Delay, d <sub>2</sub>				6.6	6.7	0.0	1.5	1.8			1.5	
Delay (s)				22.1	22.1	9.4	29.4	14.6			21.5	
Level of Service				C	C	A	C	B			C	
Approach Delay (s)		0.0			21.7			16.8			21.5	
Approach LOS		A			C			B			C	

### Intersection Summary

HCM Average Control Delay	20.8	HCM Level of Service	C
HCM Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	5.6
Intersection Capacity Utilization	87.5%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis  
 230: US-26 EB Helvetia Off-ramp & Helvetia Rd/Brookwood Pkwy

2/3/2012



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↗					↑	↗	↘	↕↕	
Volume (vph)	60	2	175	0	0	0	0	315	465	40	1670	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.6	3.6					3.0	3.0	2.0	3.0	
Lane Util. Factor		1.00	1.00					1.00	1.00	1.00	0.95	
Frt		1.00	0.85					1.00	0.85	1.00	1.00	
Flt Protected		0.95	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1812	1442					1776	1553	1805	3574	
Flt Permitted		0.95	1.00					1.00	1.00	0.95	1.00	
Satd. Flow (perm)		1812	1442					1776	1553	1805	3574	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	66	2	192	0	0	0	0	346	511	44	1835	0
RTOR Reduction (vph)	0	0	41	0	0	0	0	0	172	0	0	0
Lane Group Flow (vph)	0	68	151	0	0	0	0	346	339	44	1835	0
Heavy Vehicles (%)	0%	0%	12%	0%	0%	0%	0%	7%	4%	0%	1%	0%
Turn Type	Perm		Perm						Perm	Prot		
Protected Phases		8						6		5	2	
Permitted Phases	8		8					6				
Actuated Green, G (s)		7.0	7.0					44.5	44.5	4.5	53.0	
Effective Green, g (s)		8.4	8.4					46.5	46.5	6.5	55.0	
Actuated g/C Ratio		0.12	0.12					0.66	0.66	0.09	0.79	
Clearance Time (s)		5.0	5.0					5.0	5.0	4.0	5.0	
Vehicle Extension (s)		2.3	2.3					4.7	4.7	2.3	4.7	
Lane Grp Cap (vph)		217	173					1180	1032	168	2808	
v/s Ratio Prot								0.19		0.02	c0.51	
v/s Ratio Perm		0.04	c0.10						0.22			
v/c Ratio		0.31	0.87					0.29	0.33	0.26	0.65	
Uniform Delay, d1		28.2	30.3					4.9	5.0	29.5	3.3	
Progression Factor		1.00	1.00					1.00	1.00	1.17	0.31	
Incremental Delay, d2		0.5	34.3					0.6	0.9	0.4	0.9	
Delay (s)		28.6	64.6					5.5	5.9	34.8	2.0	
Level of Service		C	E					A	A	C	A	
Approach Delay (s)		55.2			0.0			5.8			2.7	
Approach LOS		E			A			A			A	

Intersection Summary		
HCM Average Control Delay	8.1	HCM Level of Service
HCM Volume to Capacity ratio	0.68	A
Actuated Cycle Length (s)	70.0	Sum of lost time (s)
Intersection Capacity Utilization	87.5%	6.6
Analysis Period (min)	15	ICU Level of Service
		E

c Critical Lane Group

# HCM Signalized Intersection Capacity Analysis

## 231: US-26 EB Helvetia On-ramp &

2/3/2012



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑					
Volume (vph)	505	0	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0					
Lane Util. Factor	0.95					
Frt	1.00					
Flt Protected	1.00					
Satd. Flow (prot)	3539					
Flt Permitted	1.00					
Satd. Flow (perm)	3539					
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	549	0	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	549	0	0	0	0	0
Turn Type						
Protected Phases	4					
Permitted Phases						
Actuated Green, G (s)	20.0					
Effective Green, g (s)	20.0					
Actuated g/C Ratio	1.00					
Clearance Time (s)	4.0					
Lane Grp Cap (vph)	3539					
v/s Ratio Prot	c0.16					
v/s Ratio Perm						
v/c Ratio	0.16					
Uniform Delay, d1	0.0					
Progression Factor	1.00					
Incremental Delay, d2	0.1					
Delay (s)	0.1					
Level of Service	A					
Approach Delay (s)	0.1			0.0	0.0	
Approach LOS	A			A	A	

### Intersection Summary

HCM Average Control Delay	0.1	HCM Level of Service	A
HCM Volume to Capacity ratio	0.16		
Actuated Cycle Length (s)	20.0	Sum of lost time (s)	0.0
Intersection Capacity Utilization	17.3%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

# HCM Unsignalized Intersection Capacity Analysis

## 240: Meek Rd & Brookwood Pkwy

2/3/2012

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	15	5	20	0	2	0	10	765	5	2	1840	5
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	17	6	22	0	2	0	11	850	6	2	2044	6
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)											227	
pX, platoon unblocked	0.74	0.74	0.74	0.74	0.74		0.74					
vC, conflicting volume	2500	2929	1025	1927	2929	428	2050			856		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	2328	2905	345	1557	2905	428	1723			856		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	0	51	95	100	80	100	96			100		
cM capacity (veh/h)	12	11	489	33	11	581	277			793		
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2					
Volume Total	44	2	11	567	289	1024	1028					
Volume Left	17	0	11	0	0	2	0					
Volume Right	22	0	0	0	6	0	6					
cSH	24	11	277	1700	1700	793	1700					
Volume to Capacity	1.87	0.20	0.04	0.33	0.17	0.00	0.60					
Queue Length 95th (ft)	139	13	3	0	0	0	0					
Control Delay (s)	761.4	387.5	18.6	0.0	0.0	0.1	0.0					
Lane LOS	F	F	C			A						
Approach Delay (s)	761.4	387.5	0.2			0.0						
Approach LOS	F	F										
Intersection Summary												
Average Delay			11.8									
Intersection Capacity Utilization			68.1%	ICU Level of Service		C						
Analysis Period (min)			15									

# HCM Unsignalized Intersection Capacity Analysis

## 250: Huffman St & Brookwood Pkwy

2/3/2012



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	5	40	740	30	120	1740
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	6	45	831	34	135	1955
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None		TWLTL	
Median storage veh					2	
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	2096	433			865	
vC1, stage 1 conf vol	848					
vC2, stage 2 conf vol	1247					
vCu, unblocked vol	2096	433			865	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3			2.2	
p0 queue free %	97	92			83	
cM capacity (veh/h)	173	577			780	

Direction, Lane #	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	6	45	554	311	135	978	978
Volume Left	6	0	0	0	135	0	0
Volume Right	0	45	0	34	0	0	0
cSH	173	577	1700	1700	780	1700	1700
Volume to Capacity	0.03	0.08	0.33	0.18	0.17	0.58	0.58
Queue Length 95th (ft)	3	6	0	0	16	0	0
Control Delay (s)	26.5	11.8	0.0	0.0	10.6	0.0	0.0
Lane LOS	D	B			B		
Approach Delay (s)	13.4		0.0		0.7		
Approach LOS	B						

Intersection Summary			
Average Delay		0.7	
Intersection Capacity Utilization		58.1%	ICU Level of Service B
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis  
 260: Genentech & Brookwood Pkwy

2/3/2012

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	5	0	10	0	0	0	25	835	10	5	1735	80
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	6	0	11	0	0	0	28	938	11	6	1949	90
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (ft)							1086					
pX, platoon unblocked	0.86	0.86		0.86	0.86	0.86					0.86	
vC, conflicting volume	2486	2966	975	1997	3051	475	2039				949	
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	2405	2961	975	1839	3059	75	2039				625	
tC, single (s)	7.5	6.5	7.1	7.5	6.5	6.9	4.2				4.1	
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.4	3.5	4.0	3.3	2.2				2.2	
p0 queue free %	60	100	95	100	100	100	89				99	
cM capacity (veh/h)	14	11	235	36	10	844	266				834	
Direction, Lane #	EB 1	EB 2	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3	SB 4		
Volume Total	6	11	0	28	625	324	6	975	975	90		
Volume Left	6	0	0	28	0	0	6	0	0	0		
Volume Right	0	11	0	0	0	11	0	0	0	90		
cSH	14	235	1700	266	1700	1700	834	1700	1700	1700		
Volume to Capacity	0.40	0.05	0.00	0.11	0.37	0.19	0.01	0.57	0.57	0.05		
Queue Length 95th (ft)	25	4	0	9	0	0	1	0	0	0		
Control Delay (s)	380.8	21.1	0.0	20.1	0.0	0.0	9.3	0.0	0.0	0.0		
Lane LOS	F	C	A	C			A					
Approach Delay (s)	141.0		0.0	0.6			0.0					
Approach LOS	F		A									
Intersection Summary												
Average Delay			1.0									
Intersection Capacity Utilization			58.0%			ICU Level of Service						B
Analysis Period (min)			15									

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Intersection Sign configuration not allowed in HCM analysis.

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HCM Signalized Intersection Capacity Analysis  
 270: Evergreen Pkwy & Brookwood Pkwy

2/3/2012



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖↗	↖↗		↖↗	↖↗	↖	↖	↖↗	↖	↖	↖↗	↖↗
Volume (vph)	225	390	90	105	330	50	60	595	125	70	915	760
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	2.6	4.1		2.6	4.1	4.1	2.0	3.5	3.5	2.0	3.5	3.5
Lane Util. Factor	0.97	0.95		0.97	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.88
Fr <sub>t</sub>	1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Fl <sub>t</sub> Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	3461		3072	3610	1568	1719	3312	1495	1719	3312	2450
Fl <sub>t</sub> Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	3461		3072	3610	1568	1719	3312	1495	1719	3312	2450
Peak-hour factor, PHF	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Adj. Flow (vph)	268	464	107	125	393	60	71	708	149	83	1089	905
RTOR Reduction (vph)	0	20	0	0	0	47	0	0	92	0	0	234
Lane Group Flow (vph)	268	551	0	125	393	13	71	708	57	83	1089	671
Heavy Vehicles (%)	2%	1%	3%	14%	0%	3%	5%	9%	8%	5%	9%	16%
Turn Type	Prot			Prot		Perm	Prot		custom	Prot		custom
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases						4			2			2 3
Actuated Green, G (s)	12.3	21.0		8.3	17.0	17.0	7.1	30.3	30.8	7.6	30.8	48.6
Effective Green, g (s)	13.7	22.4		9.7	18.4	18.4	9.1	32.3	32.8	9.6	32.8	50.6
Actuated g/C Ratio	0.16	0.26		0.11	0.21	0.21	0.11	0.37	0.38	0.11	0.38	0.59
Clearance Time (s)	4.0	5.5		4.0	5.5	5.5	4.0	5.5	5.5	4.0	5.5	5.5
Vehicle Extension (s)	2.3	3.1		2.3	3.1	3.1	2.4	3.1	3.1	2.4	3.1	3.1
Lane Grp Cap (vph)	546	899		346	771	335	181	1241	569	191	1260	1438
v/s Ratio Prot	c0.08	c0.16		0.04	0.11		0.04	0.21		c0.05	c0.33	
v/s Ratio Perm						0.01			0.04			c0.27
v/c Ratio	0.49	0.61		0.36	0.51	0.04	0.39	0.57	0.10	0.43	0.86	0.47
Uniform Delay, d <sub>1</sub>	33.1	28.1		35.4	29.9	26.9	36.0	21.4	17.2	35.8	24.6	10.1
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d <sub>2</sub>	0.4	1.3		0.4	0.6	0.0	0.9	0.6	0.1	1.0	6.4	0.2
Delay (s)	33.5	29.3		35.8	30.5	26.9	36.9	22.1	17.3	36.8	31.1	10.4
Level of Service	C	C		D	C	C	D	C	B	D	C	B
Approach Delay (s)		30.7			31.2			22.4			22.3	
Approach LOS		C			C			C			C	

Intersection Summary

HCM Average Control Delay	25.1	HCM Level of Service	C
HCM Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	86.2	Sum of lost time (s)	2.0
Intersection Capacity Utilization	60.7%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

# HCM Unsignalized Intersection Capacity Analysis

280: West Union Rd & Dick Rd

2/3/2012



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↗	↘			↕	
Volume (veh/h)	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	0			0			0	0	0	0	0	0
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	0			0			0	0	0	0	0	0
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	100	100	100	100
cM capacity (veh/h)	1623			1623			1023	896	1085	1023	896	1085

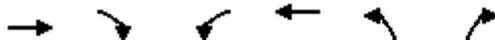
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1
Volume Total	0	0	0	0	0
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	0
cSH	1700	1700	1700	1700	1700
Volume to Capacity	0.00	0.00	0.00	0.00	0.00
Queue Length 95th (ft)	0	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0
Lane LOS			A	A	A
Approach Delay (s)	0.0	0.0	0.0		0.0
Approach LOS			A		A

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

# HCM Unsignalized Intersection Capacity Analysis

## 290: Jacobson Rd & Century Blvd

2/3/2012



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	→	↘	↙	←	↖	↗
Volume (veh/h)	225	65	15	215	25	5
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.74	0.74	0.74	0.74	0.74	0.74
Hourly flow rate (vph)	304	88	20	291	34	7
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			392		679	348
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			392		679	348
tC, single (s)			4.1		6.7	6.4
tC, 2 stage (s)						
tF (s)			2.2		3.8	3.5
p0 queue free %			98		91	99
cM capacity (veh/h)			1178		369	646

Direction, Lane #	EB 1	WB 1	NB 1	NB 2
Volume Total	392	311	34	7
Volume Left	0	20	34	0
Volume Right	88	0	0	7
cSH	1700	1178	369	646
Volume to Capacity	0.23	0.02	0.09	0.01
Queue Length 95th (ft)	0	1	7	1
Control Delay (s)	0.0	0.7	15.7	10.6
Lane LOS		A	C	B
Approach Delay (s)	0.0	0.7	14.9	
Approach LOS			B	

Intersection Summary			
Average Delay		1.1	
Intersection Capacity Utilization		33.6%	ICU Level of Service A
Analysis Period (min)		15	

# HCM Unsignalized Intersection Capacity Analysis

300: Jacobson Rd & Croeni Rd

2/3/2012



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	5	105	120	40	195	40	25	10	10	10	20	5
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71
Hourly flow rate (vph)	7	148	169	56	275	56	35	14	14	14	28	7
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		TWLTL			TWLTL							
Median storage (veh)		2			2							
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	331			317			655	690	232	599	746	303
vC1, stage 1 conf vol							246	246		415	415	
vC2, stage 2 conf vol							408	444		183	331	
vCu, unblocked vol	331			317			655	690	232	599	746	303
tC, single (s)	4.3			4.1			7.1	6.6	6.3	7.4	6.6	6.5
tC, 2 stage (s)							6.1	5.6		6.4	5.6	
tF (s)	2.4			2.2			3.5	4.1	3.4	3.7	4.0	3.6
p0 queue free %	99			96			93	97	98	97	94	99
cM capacity (veh/h)	1134			1255			504	485	785	499	475	670

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	7	317	56	331	35	28	14	35
Volume Left	7	0	56	0	35	0	14	0
Volume Right	0	169	0	56	0	14	0	7
cSH	1134	1700	1255	1700	504	600	499	504
Volume to Capacity	0.01	0.19	0.04	0.19	0.07	0.05	0.03	0.07
Queue Length 95th (ft)	0	0	4	0	6	4	2	6
Control Delay (s)	8.2	0.0	8.0	0.0	12.7	11.3	12.4	12.7
Lane LOS	A		A		B	B	B	B
Approach Delay (s)	0.2		1.2		12.1		12.6	
Approach LOS					B		B	

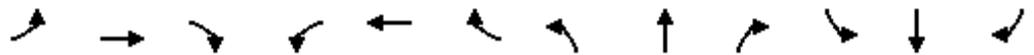
## Intersection Summary

Average Delay	2.3
Intersection Capacity Utilization	34.3%
ICU Level of Service	A
Analysis Period (min)	15

# PM Operations

HCM Unsignalized Intersection Capacity Analysis  
 10: West Union Rd & Jackson School Rd

2/3/2012



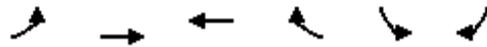
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Volume (veh/h)	10	55	40	40	65	10	65	40	60	5	30	10
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	11	59	43	43	69	11	69	43	64	5	32	11
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	80			101			287	266	80	282	282	74
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	80			101			287	266	80	282	282	74
tC, single (s)	4.1			4.2			7.2	6.5	6.2	7.1	6.5	6.4
tC, 2 stage (s)												
tF (s)	2.2			2.3			3.6	4.0	3.3	3.5	4.0	3.5
p0 queue free %	99			97			88	93	94	99	95	99
cM capacity (veh/h)	1531			1467			598	620	986	582	608	934

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	112	122	176	48
Volume Left	11	43	69	5
Volume Right	43	11	64	11
cSH	1531	1467	705	655
Volume to Capacity	0.01	0.03	0.25	0.07
Queue Length 95th (ft)	1	2	25	6
Control Delay (s)	0.8	2.8	11.8	10.9
Lane LOS	A	A	B	B
Approach Delay (s)	0.8	2.8	11.8	10.9
Approach LOS			B	B

Intersection Summary			
Average Delay		6.6	
Intersection Capacity Utilization	35.6%		ICU Level of Service A
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis  
 20: West Union Rd & Jackson Quarry Rd

2/3/2012



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↔	↔		↔	
Volume (veh/h)	30	90	75	10	5	30
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	32	95	79	11	5	32
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	89				242	84
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	89				242	84
tC, single (s)	4.1				6.4	6.3
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.4
p0 queue free %	98				99	97
cM capacity (veh/h)	1519				735	961

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	126	89	37
Volume Left	32	0	5
Volume Right	0	11	32
cSH	1519	1700	921
Volume to Capacity	0.02	0.05	0.04
Queue Length 95th (ft)	2	0	3
Control Delay (s)	2.0	0.0	9.1
Lane LOS	A		A
Approach Delay (s)	2.0	0.0	9.1
Approach LOS			A

Intersection Summary			
Average Delay		2.3	
Intersection Capacity Utilization		23.1%	ICU Level of Service A
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis  
 30: US-26 WB JS Rd On-ramp & Jackson School Rd

2/3/2012

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	500	2	60	75	100	0	0	105	2
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	0	0	0	538	2	65	81	108	0	0	113	2
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)						23						
Median type							None			None		
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	383	382	113	382	382	108	113				108	
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	383	382	113	382	382	108	113				108	
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.3	4.1				4.1	
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.4	2.2				2.2	
p0 queue free %	100	100	100	3	100	93	95				100	
cM capacity (veh/h)	515	524	945	552	524	925	1489				1496	
<b>Direction, Lane #</b>	<b>WB 1</b>	<b>NB 1</b>	<b>NB 2</b>	<b>SB 1</b>	<b>SB 2</b>							
Volume Total	604	81	108	113	2							
Volume Left	538	81	0	0	0							
Volume Right	65	0	0	0	2							
cSH	618	1489	1700	1700	1700							
Volume to Capacity	0.98	0.05	0.06	0.07	0.00							
Queue Length 95th (ft)	355	4	0	0	0							
Control Delay (s)	54.8	7.6	0.0	0.0	0.0							
Lane LOS	F	A										
Approach Delay (s)	54.8	3.2	0.0									
Approach LOS	F											
<b>Intersection Summary</b>												
Average Delay			37.1									
Intersection Capacity Utilization			51.7%		ICU Level of Service		A					
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis  
 40: US-26 EB JS Rd Off-ramp & Jackson School Rd

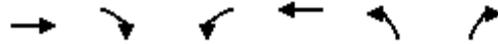
2/3/2012

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	5	2	25	0	0	0	0	170	565	45	560	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	5	2	27	0	0	0	0	183	608	48	602	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)			11									
Median type								TWLTL			None	
Median storage (veh)								2				
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	882	882	602	883	882	183	602			183		
vC1, stage 1 conf vol	699	699		183	183							
vC2, stage 2 conf vol	183	183		700	699							
vCu, unblocked vol	882	882	602	883	882	183	602			183		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)	6.1	5.5		6.1	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	99	99	95	100	100	100	100			97		
cM capacity (veh/h)	399	407	503	377	409	865	985			1404		
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>NB 1</b>	<b>NB 2</b>	<b>SB 1</b>	<b>SB 2</b>							
Volume Total	34	183	608	48	602							
Volume Left	5	0	0	48	0							
Volume Right	27	0	608	0	0							
cSH	644	1700	1700	1404	1700							
Volume to Capacity	0.05	0.11	0.36	0.03	0.35							
Queue Length 95th (ft)	4	0	0	3	0							
Control Delay (s)	12.9	0.0	0.0	7.7	0.0							
Lane LOS	B			A								
Approach Delay (s)	12.9	0.0		0.6								
Approach LOS	B											
<b>Intersection Summary</b>												
Average Delay			0.6									
Intersection Capacity Utilization			51.7%		ICU Level of Service				A			
Analysis Period (min)			15									

# HCM Signalized Intersection Capacity Analysis

## 41: US-26 EB JS Rd On-ramp &

2/3/2012



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑					
Volume (vph)	610	0	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0					
Lane Util. Factor	0.95					
Frt	1.00					
Flt Protected	1.00					
Satd. Flow (prot)	3574					
Flt Permitted	1.00					
Satd. Flow (perm)	3574					
Peak-hour factor, PHF	0.86	0.86	0.86	0.86	0.86	0.86
Adj. Flow (vph)	709	0	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	709	0	0	0	0	0
Heavy Vehicles (%)	1%	0%	0%	0%	0%	0%
Turn Type						
Protected Phases	4					
Permitted Phases						
Actuated Green, G (s)	20.0					
Effective Green, g (s)	20.0					
Actuated g/C Ratio	1.00					
Clearance Time (s)	4.0					
Lane Grp Cap (vph)	3574					
v/s Ratio Prot	c0.20					
v/s Ratio Perm						
v/c Ratio	0.20					
Uniform Delay, d1	0.0					
Progression Factor	1.00					
Incremental Delay, d2	0.1					
Delay (s)	0.1					
Level of Service	A					
Approach Delay (s)	0.1			0.0	0.0	
Approach LOS	A			A	A	
<b>Intersection Summary</b>						
HCM Average Control Delay		0.1		HCM Level of Service		A
HCM Volume to Capacity ratio		0.20				
Actuated Cycle Length (s)		20.0		Sum of lost time (s)		0.0
Intersection Capacity Utilization		20.2%		ICU Level of Service		A
Analysis Period (min)		15				
c Critical Lane Group						

HCM Unsignalized Intersection Capacity Analysis  
 50: Scotch Church Rd & Jackson School Rd

2/3/2012



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	115	20	25	620	435	140
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Hourly flow rate (vph)	131	23	28	705	494	159
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1335	574	653			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1335	574	653			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	21	96	97			
cM capacity (veh/h)	166	513	943			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	153	733	653			
Volume Left	131	28	0			
Volume Right	23	0	159			
cSH	184	943	1700			
Volume to Capacity	0.83	0.03	0.38			
Queue Length 95th (ft)	147	2	0			
Control Delay (s)	80.2	0.8	0.0			
Lane LOS	F	A				
Approach Delay (s)	80.2	0.8	0.0			
Approach LOS	F					
Intersection Summary						
Average Delay			8.4			
Intersection Capacity Utilization			67.2%	ICU Level of Service	C	
Analysis Period (min)			15			

# HCM Unsignalized Intersection Capacity Analysis

## 60: Meek Rd & Jackson School Rd

2/3/2012



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	2	15	630	5	20	435
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.82	0.82	0.82	0.82	0.82	0.82
Hourly flow rate (vph)	2	18	768	6	24	530
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1351	771			774	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1351	771			774	
tC, single (s)	6.4	6.2			4.2	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.3	
p0 queue free %	98	95			97	
cM capacity (veh/h)	162	403			815	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	21	774	555			
Volume Left	2	0	24			
Volume Right	18	6	0			
cSH	343	1700	815			
Volume to Capacity	0.06	0.46	0.03			
Queue Length 95th (ft)	5	0	2			
Control Delay (s)	16.2	0.0	0.8			
Lane LOS	C		A			
Approach Delay (s)	16.2	0.0	0.8			
Approach LOS	C					
Intersection Summary						
Average Delay			0.6			
Intersection Capacity Utilization		49.2%		ICU Level of Service		A
Analysis Period (min)		15				

HCM Signalized Intersection Capacity Analysis  
70: Evergreen Pkwy & Jackson School Rd

2/3/2012

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	315	360	2	10	700	320	5	2	10	95	5	320
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.1	4.7		4.8	4.7	4.7		5.2			5.6	5.6
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00		1.00			1.00	1.00
Frt	1.00	1.00		1.00	1.00	0.85		0.92			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.99			0.95	1.00
Satd. Flow (prot)	1787	1844		1805	1881	1599		1719			1780	1568
Flt Permitted	0.95	1.00		0.95	1.00	1.00		0.90			0.72	1.00
Satd. Flow (perm)	1787	1844		1805	1881	1599		1565			1348	1568
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	346	396	2	11	769	352	5	2	11	104	5	352
RTOR Reduction (vph)	0	0	0	0	0	178	0	9	0	0	0	298
Lane Group Flow (vph)	346	398	0	11	769	174	0	9	0	0	109	54
Heavy Vehicles (%)	1%	3%	0%	0%	1%	1%	0%	0%	0%	2%	0%	3%
Turn Type	Prot			Prot		Perm	Perm			Perm		Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases						6	8			4		4
Actuated Green, G (s)	8.5	36.7		1.2	29.1	29.1		9.1			8.7	8.7
Effective Green, g (s)	9.9	38.1		2.6	30.5	30.5		10.5			10.1	10.1
Actuated g/C Ratio	0.15	0.58		0.04	0.46	0.46		0.16			0.15	0.15
Clearance Time (s)	6.5	6.1		6.2	6.1	6.1		6.6			7.0	7.0
Vehicle Extension (s)	2.6	3.2		2.7	3.2	3.2		1.8			1.8	1.8
Lane Grp Cap (vph)	268	1066		71	871	740		249			207	240
v/s Ratio Prot	c0.19	0.22		0.01	c0.41						c0.08	0.03
v/s Ratio Perm						0.11		0.01				0.03
v/c Ratio	1.29	0.37		0.15	0.88	0.23		0.04			0.53	0.22
Uniform Delay, d1	28.0	7.5		30.6	16.1	10.7		23.4			25.7	24.5
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00			1.00	1.00
Incremental Delay, d2	156.0	0.2		0.9	10.6	0.2		0.0			1.1	0.2
Delay (s)	184.0	7.7		31.4	26.7	10.8		23.4			26.8	24.6
Level of Service	F	A		C	C	B		C			C	C
Approach Delay (s)		89.7			21.8			23.4			25.2	
Approach LOS		F			C			C			C	

Intersection Summary

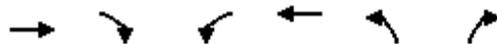
HCM Average Control Delay	43.9	HCM Level of Service	D
HCM Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	65.9	Sum of lost time (s)	15.4
Intersection Capacity Utilization	79.3%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

# HCM Signalized Intersection Capacity Analysis

## 80: Evergreen Pkwy & 15th Ave

2/3/2012



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↵	↑↑	↵	↵
Volume (vph)	345	80	235	725	300	415
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.8		5.3	4.8	6.1	6.1
Lane Util. Factor	0.95		1.00	0.95	1.00	1.00
Frt	0.97		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	3473		1787	3574	1787	1615
Flt Permitted	1.00		0.95	1.00	0.95	1.00
Satd. Flow (perm)	3473		1787	3574	1787	1615
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	392	91	267	824	341	472
RTOR Reduction (vph)	37	0	0	0	0	377
Lane Group Flow (vph)	446	0	267	824	341	95
Heavy Vehicles (%)	1%	1%	1%	1%	1%	0%
Turn Type			Prot			Perm
Protected Phases	2		1	6	8	
Permitted Phases						8
Actuated Green, G (s)	12.8		11.5	31.0	10.4	10.4
Effective Green, g (s)	14.2		12.9	32.4	10.9	10.9
Actuated g/C Ratio	0.26		0.24	0.60	0.20	0.20
Clearance Time (s)	6.2		6.7	6.2	6.6	6.6
Vehicle Extension (s)	3.2		2.6	3.2	2.0	2.0
Lane Grp Cap (vph)	910		425	2136	359	325
v/s Ratio Prot	c0.13		c0.15	0.23	c0.19	
v/s Ratio Perm						0.06
v/c Ratio	0.49		0.63	0.39	0.95	0.29
Uniform Delay, d1	16.9		18.5	5.7	21.4	18.4
Progression Factor	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	0.4		2.6	0.1	33.9	0.2
Delay (s)	17.4		21.1	5.8	55.3	18.6
Level of Service	B		C	A	E	B
Approach Delay (s)	17.4			9.6	33.9	
Approach LOS	B			A	C	

### Intersection Summary

HCM Average Control Delay	19.4	HCM Level of Service	B
HCM Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	54.2	Sum of lost time (s)	16.2
Intersection Capacity Utilization	55.2%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

# HCM Signalized Intersection Capacity Analysis

## 90: Evergreen Pkwy & 25th Ave

2/3/2012



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↖↗	↑↑	↖	↗↖
Volume (vph)	675	85	145	755	205	730
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.1		6.0	5.1	5.9	6.0
Lane Util. Factor	0.95		0.97	0.95	1.00	0.88
Frt	0.98		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	3506		3367	3574	1787	2814
Flt Permitted	1.00		0.95	1.00	0.95	1.00
Satd. Flow (perm)	3506		3367	3574	1787	2814
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	767	97	165	858	233	830
RTOR Reduction (vph)	12	0	0	0	0	40
Lane Group Flow (vph)	852	0	165	858	233	790
Heavy Vehicles (%)	1%	3%	4%	1%	1%	1%
Turn Type			Prot			custom
Protected Phases	2		1	6	3	
Permitted Phases						1 8
Actuated Green, G (s)	20.0		8.4	35.8	15.5	31.2
Effective Green, g (s)	21.4		9.8	37.2	16.9	27.5
Actuated g/C Ratio	0.33		0.15	0.57	0.26	0.42
Clearance Time (s)	6.5		7.4	6.5	7.3	
Vehicle Extension (s)	3.2		2.3	3.2	2.3	
Lane Grp Cap (vph)	1153		507	2042	464	1189
v/s Ratio Prot	c0.24		0.05	0.24	0.13	
v/s Ratio Perm						c0.28
v/c Ratio	0.74		0.33	0.42	0.50	0.66
Uniform Delay, d1	19.4		24.7	7.9	20.5	15.1
Progression Factor	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	2.6		0.2	0.2	0.5	1.2
Delay (s)	21.9		24.9	8.0	21.0	16.3
Level of Service	C		C	A	C	B
Approach Delay (s)	21.9			10.7	17.3	
Approach LOS	C			B	B	

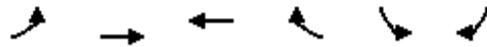
### Intersection Summary

HCM Average Control Delay	16.4	HCM Level of Service	B
HCM Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	65.1	Sum of lost time (s)	17.1
Intersection Capacity Utilization	56.2%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis  
 100: Evergreen Pkwy & Eggiman Rd/273rd Ave

2/3/2012



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↖	↑	↗		↘	
Volume (veh/h)	2	1405	900	5	5	2
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	2	1579	1011	6	6	2
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	TWLTL			
Median storage (veh)			2			
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1017				2597	1014
vC1, stage 1 conf vol					1014	
vC2, stage 2 conf vol					1583	
vCu, unblocked vol	1017				2597	1014
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)					5.4	
tF (s)	2.2				3.5	3.3
p0 queue free %	100				97	99
cM capacity (veh/h)	690				161	292

Direction, Lane #	EB 1	EB 2	WB 1	SB 1
Volume Total	2	1579	1017	8
Volume Left	2	0	0	6
Volume Right	0	0	6	2
cSH	690	1700	1700	185
Volume to Capacity	0.00	0.93	0.60	0.04
Queue Length 95th (ft)	0	0	0	3
Control Delay (s)	10.2	0.0	0.0	25.4
Lane LOS	B			D
Approach Delay (s)	0.0		0.0	25.4
Approach LOS				D

Intersection Summary			
Average Delay		0.1	
Intersection Capacity Utilization		83.9%	ICU Level of Service E
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis  
 110: West Union Rd & Groveland Rd

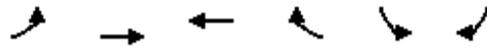
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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Volume (veh/h)	5	90	0	0	85	5	0	2	0	0	0	5
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	5	95	0	0	89	5	0	2	0	0	0	5
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	95			95			203	200	95	198	197	92
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	95			95			203	200	95	198	197	92
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	100	100	100	99
cM capacity (veh/h)	1512			1512			754	697	968	761	699	971
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>WB 1</b>	<b>NB 1</b>	<b>SB 1</b>								
Volume Total	100	95	2	5								
Volume Left	5	0	0	0								
Volume Right	0	5	0	5								
cSH	1512	1512	697	971								
Volume to Capacity	0.00	0.00	0.00	0.01								
Queue Length 95th (ft)	0	0	0	0								
Control Delay (s)	0.4	0.0	10.2	8.7								
Lane LOS	A		B	A								
Approach Delay (s)	0.4	0.0	10.2	8.7								
Approach LOS			B	A								
<b>Intersection Summary</b>												
Average Delay			0.5									
Intersection Capacity Utilization			18.8%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis  
 120: Groveland Dr & Groveland Rd

2/3/2012



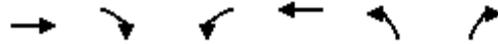
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↔	↔		↔	
Volume (veh/h)	2	10	10	2	2	2
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.63	0.63	0.63	0.63	0.63	0.63
Hourly flow rate (vph)	3	16	16	3	3	3
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	19				40	17
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	19				40	17
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	1611				975	1067

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	19	19	6
Volume Left	3	0	3
Volume Right	0	3	3
cSH	1611	1700	1019
Volume to Capacity	0.00	0.01	0.01
Queue Length 95th (ft)	0	0	0
Control Delay (s)	1.2	0.0	8.6
Lane LOS	A		A
Approach Delay (s)	1.2	0.0	8.6
Approach LOS			A

Intersection Summary			
Average Delay		1.7	
Intersection Capacity Utilization		13.3%	ICU Level of Service A
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis  
 130: Meek Rd & Sewell Rd

2/3/2012



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	→			←	←	→
Volume (veh/h)	10	5	5	25	10	5
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Hourly flow rate (vph)	11	6	6	28	11	6
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None		None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			17		54	14
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			17		54	14
tC, single (s)			4.1		6.5	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.6	3.3
p0 queue free %			100		99	99
cM capacity (veh/h)			1613		929	1071

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	17	34	17
Volume Left	0	6	11
Volume Right	6	0	6
cSH	1700	1613	972
Volume to Capacity	0.01	0.00	0.02
Queue Length 95th (ft)	0	0	1
Control Delay (s)	0.0	1.2	8.8
Lane LOS		A	A
Approach Delay (s)	0.0	1.2	8.8
Approach LOS			A

Intersection Summary			
Average Delay		2.8	
Intersection Capacity Utilization	15.6%		ICU Level of Service A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis  
 140: Evergreen Pkwy & Sewell Rd

2/3/2012



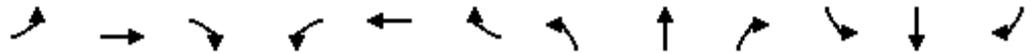
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	10	1395	5	5	900	10	0	2	0	5	0	5
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Hourly flow rate (vph)	11	1585	6	6	1023	11	0	2	0	6	0	6
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												14
Median type		TWLTL			TWLTL							
Median storage (veh)		2			2							
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1034			1591			2648	2656	1588	2649	2653	1028
vC1, stage 1 conf vol							1611	1611		1040	1040	
vC2, stage 2 conf vol							1037	1045		1609	1614	
vCu, unblocked vol	1034			1591			2648	2656	1588	2649	2653	1028
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1	5.5		6.1	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			99			100	98	100	95	100	98
cM capacity (veh/h)	680			418			113	138	134	109	135	287

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	11	1591	6	1034	2	11
Volume Left	11	0	6	0	0	6
Volume Right	0	6	0	11	0	6
cSH	680	1700	418	1700	138	218
Volume to Capacity	0.02	0.94	0.01	0.61	0.02	0.05
Queue Length 95th (ft)	1	0	1	0	1	4
Control Delay (s)	10.4	0.0	13.7	0.0	31.5	28.8
Lane LOS	B		B		D	D
Approach Delay (s)	0.1		0.1		31.5	28.8
Approach LOS					D	D

Intersection Summary		
Average Delay		0.2
Intersection Capacity Utilization	84.5%	ICU Level of Service E
Analysis Period (min)		15

HCM Unsignalized Intersection Capacity Analysis  
 150: Evergreen Pkwy & 253rd Ave/Meier-Jurgen Rd

2/3/2012



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	2	1360	30	45	890	5	10	0	60	2	0	2
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Hourly flow rate (vph)	2	1545	34	51	1011	6	11	0	68	2	0	2
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		TWLTL			TWLTL							
Median storage (veh)		2			2							
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1017			1580			2177	2686	790	1962	2701	509
vC1, stage 1 conf vol							1567	1567		1116	1116	
vC2, stage 2 conf vol							610	1119		845	1584	
vCu, unblocked vol	1017			1580			2177	2686	790	1962	2701	509
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)							6.5	5.5		6.5	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			88			90	100	80	98	100	100
cM capacity (veh/h)	690			413			111	137	333	141	104	515

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total	2	1030	549	51	674	343	80	5
Volume Left	2	0	0	51	0	0	11	2
Volume Right	0	0	34	0	0	6	68	2
cSH	690	1700	1700	413	1700	1700	259	221
Volume to Capacity	0.00	0.61	0.32	0.12	0.40	0.20	0.31	0.02
Queue Length 95th (ft)	0	0	0	11	0	0	32	2
Control Delay (s)	10.2	0.0	0.0	15.0	0.0	0.0	25.0	21.6
Lane LOS	B			B			C	C
Approach Delay (s)	0.0			0.7			25.0	21.6
Approach LOS							C	C

Intersection Summary

Average Delay	1.1
Intersection Capacity Utilization	49.6%
ICU Level of Service	A
Analysis Period (min)	15

HCM Unsignalized Intersection Capacity Analysis  
 160: West Union Rd & Helvetia Rd

2/3/2012



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	15	2	5	135	60	5
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.82	0.82	0.82	0.82	0.82	0.82
Hourly flow rate (vph)	18	2	6	165	73	6
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	253	76	79			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	253	76	79			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	98	100	100			
cM capacity (veh/h)	737	991	1532			
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>NB 1</b>	<b>SB 1</b>			
Volume Total	21	171	79			
Volume Left	18	6	0			
Volume Right	2	0	6			
cSH	760	1532	1700			
Volume to Capacity	0.03	0.00	0.05			
Queue Length 95th (ft)	2	0	0			
Control Delay (s)	9.9	0.3	0.0			
Lane LOS	A	A				
Approach Delay (s)	9.9	0.3	0.0			
Approach LOS	A					
<b>Intersection Summary</b>						
Average Delay			0.9			
Intersection Capacity Utilization			21.2%	ICU Level of Service		A
Analysis Period (min)			15			

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Intersection Sign configuration not allowed in HCM analysis.

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HCM Unsignalized Intersection Capacity Analysis  
 170: West Union Rd & Helvetia Rd

2/3/2012

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	0	70	15	85	70	20	35	120	5	15	45	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	76	16	92	76	22	38	130	5	16	49	0
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	92	190	174	65								
Volume Left (vph)	0	92	38	16								
Volume Right (vph)	16	22	5	0								
Hadj (s)	-0.11	0.05	0.02	0.05								
Departure Headway (s)	4.6	4.7	4.7	4.9								
Degree Utilization, x	0.12	0.25	0.23	0.09								
Capacity (veh/h)	720	729	723	682								
Control Delay (s)	8.2	9.2	9.1	8.3								
Approach Delay (s)	8.2	9.2	9.1	8.3								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay			8.9									
HCM Level of Service			A									
Intersection Capacity Utilization			33.9%	ICU Level of Service	A							
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis  
 180: West Union Rd & Helvetia Rd

2/3/2012



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕						↕			↕	
Volume (veh/h)	0	0	10	0	0	0	35	160	270	0	135	10
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	11	0	0	0	38	174	293	0	147	11
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	549	696	152	560	554	321	158			467		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	549	696	152	560	554	321	158			467		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	99	100	100	100	97			100		
cM capacity (veh/h)	440	358	899	428	431	725	1434			1105		

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	11	505	158
Volume Left	0	38	0
Volume Right	11	293	11
cSH	899	1434	1105
Volume to Capacity	0.01	0.03	0.00
Queue Length 95th (ft)	1	2	0
Control Delay (s)	9.1	0.8	0.0
Lane LOS	A	A	
Approach Delay (s)	9.1	0.8	0.0
Approach LOS	A		

Intersection Summary		
Average Delay		0.8
Intersection Capacity Utilization	48.0%	ICU Level of Service
Analysis Period (min)		15
		A

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Intersection Sign configuration not allowed in HCM analysis.

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HCM Unsignalized Intersection Capacity Analysis  
 190: Pubols Rd & Helvetia Rd

2/3/2012



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	5	2	445	5	2	125
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Hourly flow rate (vph)	5	2	459	5	2	129
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	594	461			464	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	594	461			464	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	99	100			100	
cM capacity (veh/h)	470	604			1108	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	7	464	131
Volume Left	5	0	2
Volume Right	2	5	0
cSH	502	1700	1108
Volume to Capacity	0.01	0.27	0.00
Queue Length 95th (ft)	1	0	0
Control Delay (s)	12.3	0.0	0.1
Lane LOS	B		A
Approach Delay (s)	12.3	0.0	0.1
Approach LOS	B		

Intersection Summary			
Average Delay		0.2	
Intersection Capacity Utilization		33.7%	ICU Level of Service A
Analysis Period (min)		15	

# HCM Unsignalized Intersection Capacity Analysis

## 200: Schaaf Rd & Helvetia Rd

2/3/2012



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	2	2	450	2	2	130
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	2	2	484	2	2	140
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	629	485			486	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	629	485			486	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	449	586			1087	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	4	486	142
Volume Left	2	0	2
Volume Right	2	2	0
cSH	508	1700	1087
Volume to Capacity	0.01	0.29	0.00
Queue Length 95th (ft)	1	0	0
Control Delay (s)	12.1	0.0	0.1
Lane LOS	B		A
Approach Delay (s)	12.1	0.0	0.1
Approach LOS	B		

Intersection Summary			
Average Delay		0.1	
Intersection Capacity Utilization		33.8%	ICU Level of Service A
Analysis Period (min)		15	

# HCM Unsignalized Intersection Capacity Analysis

## 210: Groveland Dr & Helvetia Rd

2/3/2012



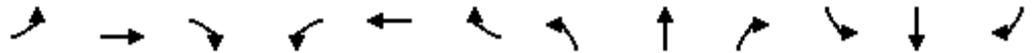
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Volume (veh/h)	2	2	15	170	2	5	10	445	455	5	125	2
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Hourly flow rate (vph)	2	2	16	187	2	5	11	489	500	5	137	2
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								TWLTL				None
Median storage (veh)								2				
Upstream signal (ft)								305				
pX, platoon unblocked	0.58	0.58		0.58	0.58	0.58				0.58		
vC, conflicting volume	917	1160	138	928	912	739	140			989		
vC1, stage 1 conf vol	149	149		761	761							
vC2, stage 2 conf vol	768	1011		167	151							
vCu, unblocked vol	500	918	138	519	491	195	140			624		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)	6.1	5.5		6.1	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	99	99	98	56	99	99	99			99		
cM capacity (veh/h)	411	253	915	422	396	497	1456			564		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	21	195	1000	145
Volume Left	2	187	11	5
Volume Right	16	5	500	2
cSH	652	424	1456	564
Volume to Capacity	0.03	0.46	0.01	0.01
Queue Length 95th (ft)	2	59	1	1
Control Delay (s)	10.7	20.5	0.2	0.6
Lane LOS	B	C	A	A
Approach Delay (s)	10.7	20.5	0.2	0.6
Approach LOS	B	C		

Intersection Summary			
Average Delay		3.3	
Intersection Capacity Utilization	78.4%		ICU Level of Service D
Analysis Period (min)		15	

HCM Signalized Intersection Capacity Analysis  
 220: US-26 WB Helvetia On-ramp & Helvetia Rd

2/3/2012



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↖	↖	↖	↖	↑			↗	↗
Volume (vph)	0	0	0	625	2	55	190	855	0	0	235	75
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				3.6	3.6	3.6	2.0	7.0			3.0	
Lane Util. Factor				0.95	0.95	1.00	1.00	1.00			0.95	
Fr <sub>t</sub>				1.00	1.00	0.85	1.00	1.00			0.96	
Fl <sub>t</sub> Protected				0.95	0.95	1.00	0.95	1.00			1.00	
Satd. Flow (prot)				1715	1720	1615	1787	1881			3479	
Fl <sub>t</sub> Permitted				0.95	0.95	1.00	0.95	1.00			1.00	
Satd. Flow (perm)				1715	1720	1615	1787	1881			3479	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	0	0	0	672	2	59	204	919	0	0	253	81
RTOR Reduction (vph)	0	0	0	0	0	18	0	0	0	0	33	0
Lane Group Flow (vph)	0	0	0	336	338	41	204	919	0	0	301	0
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	1%	1%	0%	0%	0%	0%
Turn Type				Perm		Perm	Prot					
Protected Phases					4		1	6			2	
Permitted Phases				4		4						
Actuated Green, G (s)				15.8	15.8	15.8	12.7	44.2			27.5	
Effective Green, g (s)				17.2	17.2	17.2	14.7	42.2			29.5	
Actuated g/C Ratio				0.25	0.25	0.25	0.21	0.60			0.42	
Clearance Time (s)				5.0	5.0	5.0	4.0	5.0			5.0	
Vehicle Extension (s)				2.3	2.3	2.3	2.3	3.0			5.2	
Lane Grp Cap (vph)				421	423	397	375	1134			1466	
v/s Ratio Prot							0.11	c0.49			0.09	
v/s Ratio Perm				0.20	0.20	0.03						
v/c Ratio				0.80	0.80	0.10	0.54	0.81			0.21	
Uniform Delay, d <sub>1</sub>				24.8	24.8	20.4	24.7	10.8			12.8	
Progression Factor				1.00	1.00	1.00	0.79	1.45			1.00	
Incremental Delay, d <sub>2</sub>				9.7	9.7	0.1	0.8	4.8			0.3	
Delay (s)				34.5	34.5	20.5	20.3	20.4			13.1	
Level of Service				C	C	C	C	C			B	
Approach Delay (s)		0.0			33.3			20.4			13.1	
Approach LOS		A			C			C			B	

Intersection Summary

HCM Average Control Delay	23.6	HCM Level of Service	C
HCM Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	10.6
Intersection Capacity Utilization	71.5%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis  
 230: US-26 EB Helvetia Off-ramp & Helvetia Rd/Brookwood Pkwy

2/3/2012

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Volume (vph)	60	2	60	0	0	0	0	985	780	15	845	0	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)		5.0	5.0					5.0	5.0	4.0	5.0		
Lane Util. Factor		1.00	1.00					1.00	1.00	1.00	0.95		
Frt		1.00	0.85					1.00	0.85	1.00	1.00		
Flt Protected		0.95	1.00					1.00	1.00	0.95	1.00		
Satd. Flow (prot)		1812	1615					1881	1599	1805	3610		
Flt Permitted		0.95	1.00					1.00	1.00	0.95	1.00		
Satd. Flow (perm)		1812	1615					1881	1599	1805	3610		
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	
Adj. Flow (vph)	62	2	62	0	0	0	0	1026	812	16	880	0	
RTOR Reduction (vph)	0	0	57	0	0	0	0	0	248	0	0	0	
Lane Group Flow (vph)	0	64	5	0	0	0	0	1026	564	16	880	0	
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	1%	1%	0%	0%	0%	
Turn Type	Perm		Perm							Perm	Prot		
Protected Phases		8						6		5	2		
Permitted Phases	8		8					6					
Actuated Green, G (s)		6.1	6.1					48.6	48.6	1.3	53.9		
Effective Green, g (s)		6.1	6.1					48.6	48.6	1.3	53.9		
Actuated g/C Ratio		0.09	0.09					0.69	0.69	0.02	0.77		
Clearance Time (s)		5.0	5.0					5.0	5.0	4.0	5.0		
Vehicle Extension (s)		2.3	2.3					4.7	4.7	2.3	4.7		
Lane Grp Cap (vph)		158	141					1306	1110	34	2780		
v/s Ratio Prot								c0.55		0.01	c0.24		
v/s Ratio Perm		0.04	0.00						0.35				
v/c Ratio		0.41	0.04					0.79	0.51	0.47	0.32		
Uniform Delay, d1		30.2	29.3					7.2	5.1	34.0	2.4		
Progression Factor		1.00	1.00					1.00	1.00	1.13	0.41		
Incremental Delay, d2		1.0	0.1					4.8	1.7	4.7	0.2		
Delay (s)		31.2	29.3					12.0	6.7	43.1	1.2		
Level of Service		C	C					B	A	D	A		
Approach Delay (s)		30.3			0.0			9.7			2.0		
Approach LOS		C			A			A			A		
<b>Intersection Summary</b>													
HCM Average Control Delay			8.2									HCM Level of Service	A
HCM Volume to Capacity ratio			0.76										
Actuated Cycle Length (s)			70.0									Sum of lost time (s)	15.0
Intersection Capacity Utilization			71.5%									ICU Level of Service	C
Analysis Period (min)			15										

c Critical Lane Group

# HCM Signalized Intersection Capacity Analysis

## 231: US-26 EB Helvetia On-ramp &

2/3/2012



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑					
Volume (vph)	795	0	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0					
Lane Util. Factor	0.95					
Frt	1.00					
Flt Protected	1.00					
Satd. Flow (prot)	3610					
Flt Permitted	1.00					
Satd. Flow (perm)	3610					
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	864	0	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	864	0	0	0	0	0
Heavy Vehicles (%)	0%	1%	0%	0%	0%	0%
Turn Type						
Protected Phases	4					
Permitted Phases						
Actuated Green, G (s)	20.0					
Effective Green, g (s)	20.0					
Actuated g/C Ratio	1.00					
Clearance Time (s)	4.0					
Lane Grp Cap (vph)	3610					
v/s Ratio Prot	c0.24					
v/s Ratio Perm						
v/c Ratio	0.24					
Uniform Delay, d1	0.0					
Progression Factor	1.00					
Incremental Delay, d2	0.2					
Delay (s)	0.2					
Level of Service	A					
Approach Delay (s)	0.2			0.0	0.0	
Approach LOS	A			A	A	
<b>Intersection Summary</b>						
HCM Average Control Delay			0.2		HCM Level of Service	A
HCM Volume to Capacity ratio			0.24			
Actuated Cycle Length (s)			20.0		Sum of lost time (s)	0.0
Intersection Capacity Utilization			25.3%		ICU Level of Service	A
Analysis Period (min)			15			
c Critical Lane Group						

HCM Unsignalized Intersection Capacity Analysis  
 240: Meek Rd & Brookwood Pkwy

2/3/2012

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	5	2	15	0	2	0	35	1760	1	1	890	15
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	5	2	16	0	2	0	37	1872	1	1	947	16
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												227
pX, platoon unblocked	0.92	0.92	0.92	0.92	0.92		0.92					
vC, conflicting volume	1969	2905	481	2440	2912	937	963			1873		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1885	2897	277	2394	2905	937	797			1873		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	85	85	98	100	85	100	95			100		
cM capacity (veh/h)	35	14	672	14	14	270	771			325		
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2					
Volume Total	23	2	37	1248	625	474	489					
Volume Left	5	0	37	0	0	1	0					
Volume Right	16	0	0	0	1	0	16					
cSH	72	14	771	1700	1700	325	1700					
Volume to Capacity	0.33	0.15	0.05	0.73	0.37	0.00	0.29					
Queue Length 95th (ft)	30	10	4	0	0	0	0					
Control Delay (s)	78.1	303.9	9.9	0.0	0.0	0.1	0.0					
Lane LOS	F	F	A			A						
Approach Delay (s)	78.1	303.9	0.2			0.1						
Approach LOS	F	F										
Intersection Summary												
Average Delay			1.0									
Intersection Capacity Utilization			61.2%	ICU Level of Service		B						
Analysis Period (min)			15									

# HCM Unsignalized Intersection Capacity Analysis

## 250: Huffman St & Brookwood Pkwy

2/3/2012



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	10	145	1650	15	35	870
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	11	154	1755	16	37	926
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None		TWLTL	
Median storage veh					2	
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	2301	886			1771	
vC1, stage 1 conf vol	1763					
vC2, stage 2 conf vol	537					
vCu, unblocked vol	2301	886			1771	
tC, single (s)	6.8	7.0			4.1	
tC, 2 stage (s)	5.8					
tF (s)	3.5	3.3			2.2	
p0 queue free %	91	46			90	
cM capacity (veh/h)	119	286			356	

Direction, Lane #	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	11	154	1170	601	37	463	463
Volume Left	11	0	0	0	37	0	0
Volume Right	0	154	0	16	0	0	0
cSH	119	286	1700	1700	356	1700	1700
Volume to Capacity	0.09	0.54	0.69	0.35	0.10	0.27	0.27
Queue Length 95th (ft)	7	74	0	0	9	0	0
Control Delay (s)	38.1	31.4	0.0	0.0	16.3	0.0	0.0
Lane LOS	E	D			C		
Approach Delay (s)	31.9		0.0		0.6		
Approach LOS	D						

Intersection Summary			
Average Delay		2.0	
Intersection Capacity Utilization		61.7%	ICU Level of Service B
Analysis Period (min)		15	

HCM Unsignalized Intersection Capacity Analysis  
 260: Genentech & Brookwood Pkwy

2/3/2012

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	65	0	35	5	0	10	5	1640	2	2	925	2
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73
Hourly flow rate (vph)	89	0	48	7	0	14	7	2247	3	3	1267	3
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)								1086				
pX, platoon unblocked	0.72	0.72		0.72	0.72	0.72					0.72	
vC, conflicting volume	2423	3536	634	2949	3537	1125	1270				2249	
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	2195	3748	634	2928	3750	382	1270				1952	
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1				4.1	
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2				2.2	
p0 queue free %	0	100	89	0	100	97	99				99	
cM capacity (veh/h)	18	3	427	4	3	446	554				217	
Direction, Lane #	EB 1	EB 2	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3	SB 4		
Volume Total	89	48	21	7	1498	752	3	634	634	3		
Volume Left	89	0	7	7	0	0	3	0	0	0		
Volume Right	0	48	14	0	0	3	0	0	0	3		
cSH	18	427	13	554	1700	1700	217	1700	1700	1700		
Volume to Capacity	5.08	0.11	1.61	0.01	0.88	0.44	0.01	0.37	0.37	0.00		
Queue Length 95th (ft)	Err	9	83	1	0	0	1	0	0	0		
Control Delay (s)	Err	14.5	894.2	11.6	0.0	0.0	21.8	0.0	0.0	0.0		
Lane LOS	F	B	F	B			C					
Approach Delay (s)	6504.4		894.2	0.0			0.0					
Approach LOS	F		F									
Intersection Summary												
Average Delay			246.7									
Intersection Capacity Utilization			61.1%		ICU Level of Service					B		
Analysis Period (min)			15									

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Intersection Sign configuration not allowed in HCM analysis.

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HCM Signalized Intersection Capacity Analysis  
 270: Evergreen Pkwy & Brookwood Pkwy

2/3/2012



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖↗	↖↗		↖↗	↖↗	↖	↖	↖↗	↖	↖	↖↗	↖↗
Volume (vph)	600	590	110	170	490	115	100	930	95	65	670	230
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	2.6	4.1		2.6	4.1	4.1	2.0	3.5	3.5	2.0	3.5	3.5
Lane Util. Factor	0.97	0.95		0.97	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.88
Frt	1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3303	3508		3502	3610	1615	1787	3574	1599	1805	3610	2842
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3303	3508		3502	3610	1615	1787	3574	1599	1805	3610	2842
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	674	663	124	191	551	129	112	1045	107	73	753	258
RTOR Reduction (vph)	0	14	0	0	0	99	0	0	75	0	0	113
Lane Group Flow (vph)	674	773	0	191	551	30	112	1045	32	73	753	145
Heavy Vehicles (%)	6%	0%	3%	0%	0%	0%	1%	1%	1%	0%	0%	0%
Turn Type	Prot			Prot		Perm	Prot		custom	Prot		custom
Protected Phases	3	8		7	4		1	6		5		2
Permitted Phases						4			2			2 3
Actuated Green, G (s)	21.4	33.5		9.6	21.7	21.7	11.0	31.3	27.9	7.6	27.9	54.8
Effective Green, g (s)	22.8	34.9		11.0	23.1	23.1	13.0	33.3	29.9	9.6	29.9	56.8
Actuated g/C Ratio	0.23	0.35		0.11	0.23	0.23	0.13	0.33	0.30	0.10	0.30	0.56
Clearance Time (s)	4.0	5.5		4.0	5.5	5.5	4.0	5.5	5.5	4.0	5.5	
Vehicle Extension (s)	2.3	3.1		2.3	3.1	3.1	2.4	3.1	3.1	2.4	3.1	
Lane Grp Cap (vph)	746	1212		381	826	369	230	1178	473	172	1069	1598
v/s Ratio Prot	c0.20	c0.22		0.05	0.15		c0.06	c0.29		0.04	0.21	
v/s Ratio Perm						0.02			0.02			0.05
v/c Ratio	0.90	0.64		0.50	0.67	0.08	0.49	0.89	0.07	0.42	0.70	0.09
Uniform Delay, d1	38.0	27.7		42.4	35.5	30.6	40.9	32.1	25.5	43.1	31.6	10.2
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	14.2	1.1		0.6	2.1	0.1	1.1	8.4	0.1	1.1	2.1	0.0
Delay (s)	52.2	28.9		43.0	37.5	30.7	42.0	40.4	25.6	44.2	33.8	10.2
Level of Service	D	C		D	D	C	D	D	C	D	C	B
Approach Delay (s)		39.6			37.7			39.3			28.9	
Approach LOS		D			D			D			C	

Intersection Summary		
HCM Average Control Delay	36.7	HCM Level of Service D
HCM Volume to Capacity ratio	0.74	
Actuated Cycle Length (s)	101.0	Sum of lost time (s) 4.6
Intersection Capacity Utilization	74.0%	ICU Level of Service D
Analysis Period (min)	15	

c Critical Lane Group

# HCM Unsignalized Intersection Capacity Analysis

280: West Union Rd & Dick Rd

2/3/2012



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↗	↘			↕	
Volume (veh/h)	5	350	5	5	155	10	10	2	10	15	0	5
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	5	376	5	5	167	11	11	2	11	16	0	5
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	177			382			578	578	379	584	575	172
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	177			382			578	578	379	584	575	172
tC, single (s)	4.4			4.3			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.5			2.4			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			99			97	99	98	96	100	99
cM capacity (veh/h)	1232			1061			424	426	672	414	427	877

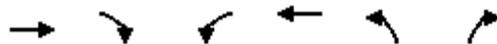
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1
Volume Total	387	183	11	13	22
Volume Left	5	5	11	0	16
Volume Right	5	11	0	11	5
cSH	1232	1061	424	613	477
Volume to Capacity	0.00	0.01	0.03	0.02	0.05
Queue Length 95th (ft)	0	0	2	2	4
Control Delay (s)	0.2	0.3	13.7	11.0	12.9
Lane LOS	A	A	B	B	B
Approach Delay (s)	0.2	0.3	12.2		12.9
Approach LOS			B		B

## Intersection Summary

Average Delay		1.1			
Intersection Capacity Utilization		35.3%		ICU Level of Service	A
Analysis Period (min)		15			

HCM Unsignalized Intersection Capacity Analysis  
 290: Jacobson Rd & Century Blvd

2/3/2012



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	→			←	←	←
Volume (veh/h)	470	30	10	100	40	15
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	528	34	11	112	45	17
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			562		680	545
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			562		680	545
tC, single (s)			4.6		6.4	6.3
tC, 2 stage (s)						
tF (s)			2.7		3.5	3.4
p0 queue free %			99		89	97
cM capacity (veh/h)			809		409	527

Direction, Lane #	EB 1	WB 1	NB 1	NB 2
Volume Total	562	124	45	17
Volume Left	0	11	45	0
Volume Right	34	0	0	17
cSH	1700	809	409	527
Volume to Capacity	0.33	0.01	0.11	0.03
Queue Length 95th (ft)	0	1	9	2
Control Delay (s)	0.0	1.0	14.9	12.1
Lane LOS		A	B	B
Approach Delay (s)	0.0	1.0	14.1	
Approach LOS			B	

Intersection Summary			
Average Delay		1.3	
Intersection Capacity Utilization		36.6%	ICU Level of Service A
Analysis Period (min)		15	

# HCM Unsignalized Intersection Capacity Analysis

300: Jacobson Rd & Croeni Rd

2/3/2012



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	5	450	40	5	80	5	30	5	20	40	15	5
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Hourly flow rate (vph)	5	495	44	5	88	5	33	5	22	44	16	5
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		TWLTL			TWLTL							
Median storage (veh)		2			2							
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	93			538			640	632	516	632	651	91
vC1, stage 1 conf vol							527	527		102	102	
vC2, stage 2 conf vol							113	104		530	549	
vCu, unblocked vol	93			538			640	632	516	632	651	91
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.5
tC, 2 stage (s)							6.1	5.5		6.1	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.6
p0 queue free %	100			99			94	99	96	91	97	99
cM capacity (veh/h)	1514			1040			511	507	563	480	492	898

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	5	538	5	93	33	27	44	22
Volume Left	5	0	5	0	33	0	44	0
Volume Right	0	44	0	5	0	22	0	5
cSH	1514	1700	1040	1700	511	551	480	555
Volume to Capacity	0.00	0.32	0.01	0.05	0.06	0.05	0.09	0.04
Queue Length 95th (ft)	0	0	0	0	5	4	8	3
Control Delay (s)	7.4	0.0	8.5	0.0	12.5	11.9	13.3	11.8
Lane LOS	A		A		B	B	B	B
Approach Delay (s)	0.1		0.5		12.2		12.8	
Approach LOS					B		B	

## Intersection Summary

Average Delay	2.2
Intersection Capacity Utilization	41.7%
ICU Level of Service	A
Analysis Period (min)	15

# HCM Signalized Intersection Capacity Analysis

## 310: Evergreen Pkwy & 235th Ave

2/3/2012



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	15	875	5	5	755	10	25	5	40	35	2	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.5	5.2	5.2	7.3	5.2		6.7	6.7	6.7	6.7	6.7	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		0.95	0.95	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85	1.00	0.85	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	0.97	1.00	0.95	1.00	
Satd. Flow (prot)	1687	3574	1615	1805	3533		1466	1569	1568	1703	1623	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.71	0.76	1.00	0.75	1.00	
Satd. Flow (perm)	1687	3574	1615	1805	3533		1096	1225	1568	1335	1623	
Peak-hour factor, PHF	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Adj. Flow (vph)	17	1017	6	6	878	12	29	6	47	41	2	70
RTOR Reduction (vph)	0	0	3	0	1	0	0	0	40	0	60	0
Lane Group Flow (vph)	17	1017	3	6	889	0	17	18	7	41	12	0
Heavy Vehicles (%)	7%	1%	0%	0%	2%	0%	17%	0%	3%	6%	0%	0%
Turn Type	Prot		Perm	Prot			Perm		Perm	Perm		
Protected Phases	5	2		1	6			8				4
Permitted Phases			2				8		8	4		
Actuated Green, G (s)	1.2	36.2	36.2	1.0	36.8		9.1	9.1	9.1	9.1	9.1	
Effective Green, g (s)	1.2	36.2	36.2	1.0	36.8		9.1	9.1	9.1	9.1	9.1	
Actuated g/C Ratio	0.02	0.55	0.55	0.02	0.56		0.14	0.14	0.14	0.14	0.14	
Clearance Time (s)	6.5	5.2	5.2	7.3	5.2		6.7	6.7	6.7	6.7	6.7	
Vehicle Extension (s)	2.6	3.1	3.1	2.3	3.1		2.4	2.4	2.4	2.4	2.4	
Lane Grp Cap (vph)	31	1975	893	28	1985		152	170	218	185	225	
v/s Ratio Prot	c0.01	c0.28		0.00	0.25							0.01
v/s Ratio Perm			0.00				0.02	0.01	0.00	c0.03		
v/c Ratio	0.55	0.51	0.00	0.21	0.45		0.11	0.11	0.03	0.22	0.05	
Uniform Delay, d1	31.9	9.2	6.6	31.9	8.4		24.7	24.6	24.4	25.1	24.5	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	15.5	0.2	0.0	2.2	0.2		0.2	0.2	0.0	0.4	0.1	
Delay (s)	47.3	9.4	6.6	34.1	8.6		24.9	24.8	24.4	25.5	24.5	
Level of Service	D	A	A	C	A		C	C	C	C	C	
Approach Delay (s)		10.0			8.7			24.6			24.9	
Approach LOS		A			A			C			C	

### Intersection Summary

HCM Average Control Delay	10.8	HCM Level of Service	B
HCM Volume to Capacity ratio	0.45		
Actuated Cycle Length (s)	65.5	Sum of lost time (s)	18.4
Intersection Capacity Utilization	48.0%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis  
320: Evergreen Pkwy & 229th Ave

2/3/2012



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	10	790	110	220	555	70	85	40	630	170	55	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.8	4.7	4.7	5.8	4.6		6.4	5.5	6.4	6.4	5.5	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.98		1.00	1.00	0.85	1.00	0.98	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1805	3574	1615	1787	3499		1805	1792	1599	1736	1855	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1805	3574	1615	1787	3499		1805	1792	1599	1736	1855	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	11	840	117	234	590	74	90	43	670	181	59	11
RTOR Reduction (vph)	0	0	80	0	6	0	0	0	177	0	7	0
Lane Group Flow (vph)	11	840	37	234	658	0	90	43	493	181	63	0
Heavy Vehicles (%)	0%	1%	0%	1%	1%	5%	0%	6%	1%	4%	0%	0%
Turn Type	Prot		Perm	Prot			Prot		custom	Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2						1 8			
Actuated Green, G (s)	0.4	34.8	34.8	28.4	62.9		6.8	9.4	44.1	16.0	18.6	
Effective Green, g (s)	1.8	36.2	36.2	29.8	64.3		7.6	10.2	39.4	16.8	19.4	
Actuated g/C Ratio	0.02	0.31	0.31	0.26	0.56		0.07	0.09	0.34	0.15	0.17	
Clearance Time (s)	7.2	6.1	6.1	7.2	6.0		7.2	6.3		7.2	6.3	
Vehicle Extension (s)	2.4	3.1	3.1	2.4	3.1		2.4	3.6		2.4	3.6	
Lane Grp Cap (vph)	28	1121	507	461	1950		119	158	546	253	312	
v/s Ratio Prot	0.01	c0.24		0.13	0.19		0.05	0.02		c0.10	0.03	
v/s Ratio Perm			0.02						c0.31			
v/c Ratio	0.39	0.75	0.07	0.51	0.34		0.76	0.27	0.90	0.72	0.20	
Uniform Delay, d1	56.3	35.5	27.8	36.5	13.9		53.0	49.1	36.2	47.0	41.3	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	5.9	2.8	0.1	0.6	0.1		22.3	1.1	18.1	8.5	0.4	
Delay (s)	62.1	38.3	27.9	37.1	14.0		75.3	50.3	54.3	55.5	41.7	
Level of Service	E	D	C	D	B		E	D	D	E	D	
Approach Delay (s)		37.3			20.1			56.4			51.7	
Approach LOS		D			C			E			D	

Intersection Summary

HCM Average Control Delay	38.5	HCM Level of Service	D
HCM Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	115.4	Sum of lost time (s)	23.9
Intersection Capacity Utilization	84.1%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

# HCM Signalized Intersection Capacity Analysis

## 330: West Union Rd & Cornelius Pass Rd

2/3/2012



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	115	195	95	225	75	20	60	850	680	25	395	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.5	4.0	4.0	5.5		4.0	5.5	5.5	4.0	5.5	
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00		1.00	1.00	1.00	1.00	0.95	
Frt	1.00	1.00	0.85	1.00	0.97		1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1752	1900	1568	3433	1709		1597	1827	1615	1671	3354	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1752	1900	1568	3433	1709		1597	1827	1615	1671	3354	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	119	201	98	232	77	21	62	876	701	26	407	31
RTOR Reduction (vph)	0	0	75	0	11	0	0	0	191	0	4	0
Lane Group Flow (vph)	119	201	23	232	87	0	62	876	510	26	434	0
Heavy Vehicles (%)	3%	0%	3%	2%	8%	6%	13%	4%	0%	8%	7%	0%
Turn Type	Prot		custom	Prot			Prot		custom	Prot		
Protected Phases	3			7	4		1	6		5	2	
Permitted Phases		8	1 8						6 7			
Actuated Green, G (s)	14.0	16.0	23.2	13.4	15.4		7.2	48.5	61.9	3.1	44.4	
Effective Green, g (s)	14.0	16.0	23.2	13.4	15.4		7.2	48.5	61.9	3.1	44.4	
Actuated g/C Ratio	0.14	0.16	0.23	0.13	0.15		0.07	0.48	0.62	0.03	0.44	
Clearance Time (s)	4.0	5.5		4.0	5.5		4.0	5.5		4.0	5.5	
Vehicle Extension (s)	2.4	3.2		2.5	3.2		2.3	3.2		2.2	3.2	
Lane Grp Cap (vph)	245	304	364	460	263		115	886	1000	52	1489	
v/s Ratio Prot	0.07			0.07	c0.05		c0.04	c0.48		0.02	0.13	
v/s Ratio Perm		c0.11	0.01						c0.32			
v/c Ratio	0.49	0.66	0.06	0.50	0.33		0.54	0.99	0.51	0.50	0.29	
Uniform Delay, d1	39.7	39.5	29.9	40.2	37.7		44.8	25.5	10.6	47.7	17.8	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.27	0.58	0.72	1.00	1.00	
Incremental Delay, d2	1.0	5.4	0.0	0.6	0.8		2.2	22.3	0.2	3.8	0.5	
Delay (s)	40.7	44.9	30.0	40.9	38.5		59.0	37.1	7.8	51.5	18.2	
Level of Service	D	D	C	D	D		E	D	A	D	B	
Approach Delay (s)		40.2			40.2			25.4			20.1	
Approach LOS		D			D			C			C	

### Intersection Summary

HCM Average Control Delay	28.4	HCM Level of Service	C
HCM Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	26.0
Intersection Capacity Utilization	79.0%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis  
 340: Jacobson Rd & Cornelius Pass Rd

2/3/2012



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	335	30	180	30	5	5	40	1250	60	10	650	55
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	5.5		4.0	5.5	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.87		1.00	0.93		1.00	0.99		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1628		1805	1758		1641	3518		1805	3425	
Flt Permitted	0.75	1.00		0.46	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1399	1628		873	1758		1641	3518		1805	3425	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	364	33	196	33	5	5	43	1359	65	11	707	60
RTOR Reduction (vph)	0	144	0	0	4	0	0	3	0	0	6	0
Lane Group Flow (vph)	364	85	0	33	6	0	43	1421	0	11	761	0
Heavy Vehicles (%)	2%	0%	2%	0%	0%	0%	10%	2%	0%	0%	4%	6%
Turn Type	Perm			Perm			Prot			Prot		
Protected Phases		4			8		1	6		5	2	
Permitted Phases	4			8								
Actuated Green, G (s)	26.5	26.5		26.5	26.5		5.3	58.6		1.4	54.7	
Effective Green, g (s)	26.5	26.5		26.5	26.5		5.3	58.6		1.4	54.7	
Actuated g/C Ratio	0.26	0.26		0.26	0.26		0.05	0.59		0.01	0.55	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	5.5		4.0	5.5	
Vehicle Extension (s)	1.6	1.6		1.6	1.6		2.6	3.1		2.6	3.1	
Lane Grp Cap (vph)	371	431		231	466		87	2062		25	1873	
v/s Ratio Prot		0.05			0.00		c0.03	c0.40		0.01	0.22	
v/s Ratio Perm	c0.26			0.04								
v/c Ratio	0.98	0.20		0.14	0.01		0.49	0.69		0.44	0.41	
Uniform Delay, d1	36.5	28.5		28.1	27.1		46.0	14.4		48.9	13.2	
Progression Factor	1.00	1.00		1.00	1.00		1.37	0.41		1.31	0.51	
Incremental Delay, d2	41.4	0.1		0.1	0.0		2.8	1.5		9.1	0.6	
Delay (s)	77.9	28.6		28.2	27.1		66.1	7.4		73.0	7.4	
Level of Service	E	C		C	C		E	A		E	A	
Approach Delay (s)		58.9			27.9			9.1			8.3	
Approach LOS		E			C			A			A	

Intersection Summary

HCM Average Control Delay	19.4	HCM Level of Service	B
HCM Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	69.6%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

# HCM Signalized Intersection Capacity Analysis

## 350: Rock Creek Blvd & Cornelius Pass Rd

2/3/2012



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	←←		↑↑	↗	↖	↑↑
Volume (vph)	145	25	1325	345	60	810
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		5.0	4.0	4.0	5.5
Lane Util. Factor	0.97		0.95	1.00	1.00	0.95
Frt	0.98		1.00	0.85	1.00	1.00
Flt Protected	0.96		1.00	1.00	0.95	1.00
Satd. Flow (prot)	3325		3505	1599	1805	3438
Flt Permitted	0.96		1.00	1.00	0.95	1.00
Satd. Flow (perm)	3325		3505	1599	1805	3438
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	159	27	1456	379	66	890
RTOR Reduction (vph)	16	0	0	78	0	0
Lane Group Flow (vph)	170	0	1456	301	66	890
Heavy Vehicles (%)	4%	4%	3%	1%	0%	5%
Turn Type			custom		Prot	
Protected Phases	4		6		5	2
Permitted Phases				4 6		
Actuated Green, G (s)	11.5		68.0	84.5	7.5	79.0
Effective Green, g (s)	11.5		68.0	79.5	7.5	79.0
Actuated g/C Ratio	0.12		0.68	0.80	0.08	0.79
Clearance Time (s)	4.0		5.0		4.0	5.5
Vehicle Extension (s)	2.2		2.4		2.6	2.4
Lane Grp Cap (vph)	382		2383	1271	135	2716
v/s Ratio Prot	c0.05		c0.42		c0.04	0.26
v/s Ratio Perm				0.19		
v/c Ratio	0.45		0.61	0.24	0.49	0.33
Uniform Delay, d1	41.3		8.8	2.6	44.4	3.0
Progression Factor	1.00		1.26	5.52	0.76	1.21
Incremental Delay, d2	0.4		0.9	0.0	2.0	0.3
Delay (s)	41.7		12.0	14.3	35.9	3.9
Level of Service	D		B	B	D	A
Approach Delay (s)	41.7		12.5			6.1
Approach LOS	D		B			A

### Intersection Summary

HCM Average Control Delay	12.3	HCM Level of Service	B
HCM Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	56.6%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis  
 360: US-26 WB NB Corn Pass Off-ramp & Cornelius Pass Rd

2/3/2012



Movement	EBR	WBR2	NBL	NBT	SBT
Lane Configurations					
Volume (vph)	700	300	270	1550	995
Ideal Flow (vphpl)	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	5.0	5.0
Lane Util. Factor	1.00	0.88	1.00	0.95	0.95
Frt	0.86	0.85	1.00	1.00	1.00
Flt Protected	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1611	2707	1770	3539	3505
Flt Permitted	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1611	2707	1770	3539	3505
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	722	309	278	1598	1026
RTOR Reduction (vph)	178	20	0	0	0
Lane Group Flow (vph)	544	289	278	1598	1026
Heavy Vehicles (%)	2%	5%	2%	2%	3%
Turn Type	custom	custom	Prot		
Protected Phases			1	6	2
Permitted Phases	4	4			
Actuated Green, G (s)	31.8	31.8	11.2	46.5	31.3
Effective Green, g (s)	31.8	31.8	11.2	46.5	31.3
Actuated g/C Ratio	0.36	0.36	0.13	0.53	0.36
Clearance Time (s)	4.0	4.0	4.0	5.0	5.0
Vehicle Extension (s)	2.3	2.3	2.3	4.5	4.5
Lane Grp Cap (vph)	587	986	227	1885	1257
v/s Ratio Prot			c0.16	c0.45	0.29
v/s Ratio Perm	c0.34	0.11			
v/c Ratio	0.93	0.29	1.22	0.85	0.82
Uniform Delay, d1	26.6	19.8	38.0	17.4	25.4
Progression Factor	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	20.6	0.1	133.8	4.1	4.6
Delay (s)	47.3	19.8	171.8	21.4	30.0
Level of Service	D	B	F	C	C
Approach Delay (s)				43.7	30.0
Approach LOS				D	C

Intersection Summary			
HCM Average Control Delay	38.9	HCM Level of Service	D
HCM Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	87.3	Sum of lost time (s)	8.0
Intersection Capacity Utilization	Err%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis  
 361: Cornelius Pass Rd &

2/3/2012



Movement	NBL	NBT	SBT	SBR	NEL	NER
Lane Configurations		↑↑	↑↑	↗		
Volume (veh/h)	0	1850	995	180	0	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.97	0.97	0.90	0.90
Hourly flow rate (vph)	0	2056	1026	186	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)		258	829			
pX, platoon unblocked	0.89				0.65	0.89
vC, conflicting volume	1211				2054	513
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	998				819	216
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	627				208	710

Direction, Lane #	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	1028	1028	513	513	186
Volume Left	0	0	0	0	0
Volume Right	0	0	0	0	186
cSH	1700	1700	1700	1700	1700
Volume to Capacity	0.60	0.60	0.30	0.30	0.11
Queue Length 95th (ft)	0	0	0	0	0
Control Delay (s)	0.0	0.0	0.0	0.0	0.0
Lane LOS					
Approach Delay (s)	0.0		0.0		
Approach LOS					

Intersection Summary					
Average Delay			0.0		
Intersection Capacity Utilization			54.5%	ICU Level of Service	A
Analysis Period (min)			15		

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Intersection Sign configuration not allowed in HCM analysis.

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HCM Signalized Intersection Capacity Analysis  
 370: US-26 EB Corn Pass Off-ramp & Cornelius Pass Rd

2/3/2012



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↗					↕↕	↗		↕↕↕	
Volume (vph)	165	0	125	0	0	0	0	1655	920	0	1395	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0					5.0	5.0		5.0	
Lane Util. Factor		1.00	1.00					0.95	1.00		0.91	
Frt		1.00	0.85					1.00	0.85		1.00	
Flt Protected		0.95	1.00					1.00	1.00		1.00	
Satd. Flow (prot)		1719	1553					3539	1583		5085	
Flt Permitted		0.95	1.00					1.00	1.00		1.00	
Satd. Flow (perm)		1719	1553					3539	1583		5085	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	170	0	129	0	0	0	0	1706	948	0	1438	0
RTOR Reduction (vph)	0	0	38	0	0	0	0	0	312	0	0	0
Lane Group Flow (vph)	0	170	91	0	0	0	0	1706	636	0	1438	0
Heavy Vehicles (%)	5%	0%	4%	0%	0%	0%	0%	2%	2%	0%	2%	0%
Turn Type	Perm		Perm							Perm		
Protected Phases		8						6			2	
Permitted Phases	8		8						6			
Actuated Green, G (s)		11.9	11.9					42.6	42.6		42.6	
Effective Green, g (s)		11.9	11.9					42.6	42.6		42.6	
Actuated g/C Ratio		0.19	0.19					0.67	0.67		0.67	
Clearance Time (s)		4.0	4.0					5.0	5.0		5.0	
Vehicle Extension (s)		2.3	2.3					4.5	4.5		4.5	
Lane Grp Cap (vph)		322	291					2374	1062		3411	
v/s Ratio Prot								c0.48			0.28	
v/s Ratio Perm		0.10	0.06						0.40			
v/c Ratio		0.53	0.31					0.72	0.60		0.42	
Uniform Delay, d1		23.3	22.3					6.6	5.7		4.8	
Progression Factor		1.00	1.00					1.00	1.00		1.00	
Incremental Delay, d2		1.0	0.4					1.2	1.2		0.1	
Delay (s)		24.3	22.6					7.9	7.0		4.9	
Level of Service		C	C					A	A		A	
Approach Delay (s)		23.6			0.0			7.5			4.9	
Approach LOS		C			A			A			A	

Intersection Summary			
HCM Average Control Delay	7.8	HCM Level of Service	A
HCM Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	63.5	Sum of lost time (s)	9.0
Intersection Capacity Utilization	73.6%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis  
 371: Cornelius Pass Rd &

2/3/2012



Movement	NBL	NBT	SBT	SBR	NEL	NER
Lane Configurations		↑↑	↑↑↑			
Volume (veh/h)	0	1820	1395	300	0	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Hourly flow rate (vph)	0	2068	1585	341	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)		227	826			
pX, platoon unblocked	0.83				0.76	0.83
vC, conflicting volume	1926				2790	699
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1384				1341	0
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	414				110	901
<b>Direction, Lane #</b>	<b>NB 1</b>	<b>NB 2</b>	<b>SB 1</b>	<b>SB 2</b>	<b>SB 3</b>	
Volume Total	1034	1034	634	634	658	
Volume Left	0	0	0	0	0	
Volume Right	0	0	0	0	341	
cSH	1700	1700	1700	1700	1700	
Volume to Capacity	0.61	0.61	0.37	0.37	0.39	
Queue Length 95th (ft)	0	0	0	0	0	
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	
Lane LOS						
Approach Delay (s)	0.0		0.0			
Approach LOS						
<b>Intersection Summary</b>						
Average Delay			0.0			
Intersection Capacity Utilization			73.6%		ICU Level of Service	D
Analysis Period (min)			15			

# HCM Signalized Intersection Capacity Analysis

373: Int

2/3/2012

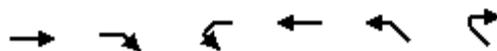


Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑					
Volume (vph)	920	0	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0					
Lane Util. Factor	0.95					
Frt	1.00					
Flt Protected	1.00					
Satd. Flow (prot)	3539					
Flt Permitted	1.00					
Satd. Flow (perm)	3539					
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	948	0	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	948	0	0	0	0	0
Heavy Vehicles (%)	2%	0%	0%	0%	0%	0%
Turn Type						
Protected Phases	4					
Permitted Phases						
Actuated Green, G (s)	20.0					
Effective Green, g (s)	20.0					
Actuated g/C Ratio	1.00					
Clearance Time (s)	4.0					
Lane Grp Cap (vph)	3539					
v/s Ratio Prot	c0.27					
v/s Ratio Perm						
v/c Ratio	0.27					
Uniform Delay, d1	0.0					
Progression Factor	1.00					
Incremental Delay, d2	0.2					
Delay (s)	0.2					
Level of Service	A					
Approach Delay (s)	0.2			0.0	0.0	
Approach LOS	A			A	A	
<b>Intersection Summary</b>						
HCM Average Control Delay			0.2		HCM Level of Service	A
HCM Volume to Capacity ratio			0.27			
Actuated Cycle Length (s)			20.0		Sum of lost time (s)	0.0
Intersection Capacity Utilization			28.8%		ICU Level of Service	A
Analysis Period (min)			15			
c Critical Lane Group						

# HCM Unsignalized Intersection Capacity Analysis

## 376: US-26 EB Corn Pass Off-ramp &

2/3/2012



Movement	EBT	EBR	WBL	WBT	NWL	NWR
Lane Configurations		↗		↖		
Volume (veh/h)	0	290	0	300	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Hourly flow rate (vph)	0	299	0	309	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			299		309	0
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			299		309	0
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			1274		687	1091
<b>Direction, Lane #</b>	<b>EB 1</b>	<b>WB 1</b>				
Volume Total	299	309				
Volume Left	0	0				
Volume Right	299	0				
cSH	1700	1700				
Volume to Capacity	0.18	0.18				
Queue Length 95th (ft)	0	0				
Control Delay (s)	0.0	0.0				
Lane LOS						
Approach Delay (s)	0.0	0.0				
Approach LOS						
<b>Intersection Summary</b>						
Average Delay			0.0			
Intersection Capacity Utilization			21.3%		ICU Level of Service	A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis  
 377: US-26 WB Corn Pass Off-ramp &

2/3/2012



Movement	WBR	WBR2	SBL	SBR	SEL
Lane Configurations		↑↑			↑
Volume (veh/h)	0	300	0	0	290
Sign Control	Free		Stop		Free
Grade	0%		0%		0%
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97
Hourly flow rate (vph)	0	309	0	0	299
Pedestrians					
Lane Width (ft)					
Walking Speed (ft/s)					
Percent Blockage					
Right turn flare (veh)					
Median type	None				None
Median storage (veh)					
Upstream signal (ft)					
pX, platoon unblocked					
vC, conflicting volume			299	0	
vC1, stage 1 conf vol					
vC2, stage 2 conf vol					
vCu, unblocked vol			299	0	
tC, single (s)			6.4	6.2	
tC, 2 stage (s)					
tF (s)			3.5	3.3	
p0 queue free %			100	100	
cM capacity (veh/h)			697	1091	

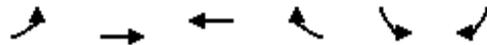
Direction, Lane #	WB 1	WB 2	SE 1
Volume Total	155	155	299
Volume Left	0	0	0
Volume Right	155	155	0
cSH	1700	1700	1700
Volume to Capacity	0.09	0.09	0.18
Queue Length 95th (ft)	0	0	0
Control Delay (s)	0.0	0.0	0.0
Lane LOS			
Approach Delay (s)	0.0		0.0
Approach LOS			

Intersection Summary			
Average Delay		0.0	
Intersection Capacity Utilization		Err%	ICU Level of Service H
Analysis Period (min)		15	

# HCM Signalized Intersection Capacity Analysis

379: Int

2/3/2012



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑				
Volume (vph)	0	300	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0				
Lane Util. Factor		0.95				
Frt		1.00				
Flt Protected		1.00				
Satd. Flow (prot)		3438				
Flt Permitted		1.00				
Satd. Flow (perm)		3438				
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	0	309	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	0	309	0	0	0	0
Heavy Vehicles (%)	0%	5%	0%	0%	0%	0%
<b>Turn Type</b>						
Protected Phases						
Permitted Phases		2				
Actuated Green, G (s)		20.0				
Effective Green, g (s)		20.0				
Actuated g/C Ratio		1.00				
Clearance Time (s)		4.0				
Lane Grp Cap (vph)		3438				
v/s Ratio Prot						
v/s Ratio Perm		c0.09				
v/c Ratio		0.09				
Uniform Delay, d1		0.0				
Progression Factor		1.00				
Incremental Delay, d2		0.1				
Delay (s)		0.1				
Level of Service		A				
Approach Delay (s)		0.1	0.0		0.0	
Approach LOS		A	A		A	
<b>Intersection Summary</b>						
HCM Average Control Delay			0.1		HCM Level of Service	A
HCM Volume to Capacity ratio			0.09			
Actuated Cycle Length (s)			20.0		Sum of lost time (s)	0.0
Intersection Capacity Utilization			11.6%		ICU Level of Service	A
Analysis Period (min)			15			
c Critical Lane Group						

HCM Signalized Intersection Capacity Analysis  
380: Evergreen Pkwy & Cornelius Pass Rd

2/3/2012

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	 	 		 	 		 	 		 	 	 
Volume (vph)	380	860	160	80	355	410	55	1070	80	230	985	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.5		4.0	5.5		4.0	5.5		4.0	5.5	4.0
Lane Util. Factor	0.97	0.95		1.00	0.95		1.00	0.95		1.00	0.95	1.00
Frt	1.00	0.98		1.00	0.92		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3467	3514		1787	3270		1770	3507		1752	3539	1538
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3467	3514		1787	3270		1770	3507		1752	3539	1538
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	396	896	167	83	370	427	57	1115	83	240	1026	26
RTOR Reduction (vph)	0	12	0	0	145	0	0	4	0	0	0	14
Lane Group Flow (vph)	396	1051	0	83	652	0	57	1194	0	240	1026	12
Heavy Vehicles (%)	1%	0%	2%	1%	1%	2%	2%	2%	0%	3%	2%	5%
Turn Type	Prot			Prot			Prot			Prot		custom
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												5 6
Actuated Green, G (s)	18.2	41.6		7.9	31.3		7.2	40.6		11.1	44.5	55.7
Effective Green, g (s)	18.2	41.6		7.9	31.3		7.2	40.6		11.1	44.5	55.7
Actuated g/C Ratio	0.15	0.35		0.07	0.26		0.06	0.34		0.09	0.37	0.46
Clearance Time (s)	4.0	5.5		4.0	5.5		4.0	5.5		4.0	5.5	
Vehicle Extension (s)	2.3	3.1		2.4	3.1		2.4	3.1		2.4	3.1	
Lane Grp Cap (vph)	525	1216		117	852		106	1185		162	1310	713
v/s Ratio Prot	c0.11	c0.30		0.05	0.20		0.03	c0.34		c0.14	c0.29	
v/s Ratio Perm												0.01
v/c Ratio	0.75	0.86		0.71	0.77		0.54	1.01		1.48	0.78	0.02
Uniform Delay, d1	48.9	36.7		55.0	41.1		54.9	39.8		54.6	33.6	17.4
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	5.6	6.6		16.3	4.2		3.7	28.0		246.7	3.2	0.0
Delay (s)	54.5	43.3		71.3	45.2		58.6	67.8		301.2	36.7	17.4
Level of Service	D	D		E	D		E	E		F	D	B
Approach Delay (s)		46.3			47.7			67.4			85.5	
Approach LOS		D			D			E			F	

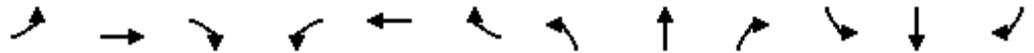
Intersection Summary

HCM Average Control Delay	62.3	HCM Level of Service	E
HCM Volume to Capacity ratio	1.02		
Actuated Cycle Length (s)	120.2	Sum of lost time (s)	24.5
Intersection Capacity Utilization	94.5%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis  
390: Wagon Way & Cornelius Pass Rd

2/3/2012



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↗		↕		↗	↕		↗	↕	↗
Volume (vph)	30	2	245	5	2	2	205	1640	5	2	925	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5	4.5		4.0		4.0	5.5		4.0	5.5	5.5
Lane Util. Factor		1.00	1.00		1.00		0.97	0.95		1.00	0.95	1.00
Fr <sub>t</sub>		1.00	0.85		0.97		1.00	1.00		1.00	1.00	0.85
Fl <sub>t</sub> Protected		0.96	1.00		0.97		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)		1815	1553		1638		3433	3535		1805	3471	1568
Fl <sub>t</sub> Permitted		0.74	1.00		0.89		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)		1410	1553		1500		3433	3535		1805	3471	1568
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	32	2	258	5	2	2	216	1726	5	2	974	32
RTOR Reduction (vph)	0	0	230	0	2	0	0	0	0	0	0	8
Lane Group Flow (vph)	0	34	28	0	7	0	216	1731	0	2	974	24
Heavy Vehicles (%)	0%	0%	4%	17%	0%	0%	2%	2%	25%	0%	4%	3%
Turn Type	Perm		Perm	Perm			Prot			Prot		Perm
Protected Phases		8			4		1	6		5	2	
Permitted Phases	8		8	4								2
Actuated Green, G (s)		10.9	10.9		11.4		10.9	73.9		1.2	64.2	64.2
Effective Green, g (s)		10.9	10.9		11.4		10.9	73.9		1.2	64.2	64.2
Actuated g/C Ratio		0.11	0.11		0.11		0.11	0.74		0.01	0.64	0.64
Clearance Time (s)		4.5	4.5		4.0		4.0	5.5		4.0	5.5	5.5
Vehicle Extension (s)		1.4	1.4		2.3		2.3	2.4		2.6	2.4	2.4
Lane Grp Cap (vph)		154	169		171		374	2612		22	2228	1007
v/s Ratio Prot							c0.06	c0.49		0.00	0.28	
v/s Ratio Perm		c0.02	0.02		0.00							0.02
v/c Ratio		0.22	0.17		0.04		0.58	0.66		0.09	0.44	0.02
Uniform Delay, d <sub>1</sub>		40.7	40.4		39.4		42.4	6.7		48.9	8.9	6.5
Progression Factor		1.00	1.00		1.00		1.00	1.00		1.07	0.45	0.31
Incremental Delay, d <sub>2</sub>		0.3	0.2		0.1		1.6	1.3		1.4	0.6	0.0
Delay (s)		40.9	40.6		39.5		44.0	8.0		53.5	4.6	2.0
Level of Service		D	D		D		D	A		D	A	A
Approach Delay (s)		40.6			39.5			12.0			4.6	
Approach LOS		D			D			B			A	

Intersection Summary

HCM Average Control Delay	12.4	HCM Level of Service	B
HCM Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	66.3%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

# AM Queuing

## Queues

### 41: US-26 EB JS Rd On-ramp &

2/3/2012

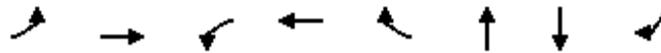


Lane Group	EBT
Lane Group Flow (vph)	715
v/c Ratio	0.21
Control Delay	0.1
Queue Delay	0.0
Total Delay	0.1
Queue Length 50th (ft)	0
Queue Length 95th (ft)	0
Internal Link Dist (ft)	1022
Turn Bay Length (ft)	
Base Capacity (vph)	3374
Starvation Cap Reductn	0
Spillback Cap Reductn	0
Storage Cap Reductn	0
Reduced v/c Ratio	0.21
Intersection Summary	

Queues

70: Evergreen Pkwy & Jackson School Rd

2/3/2012



Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	SBT	SBR
Lane Group Flow (vph)	431	680	6	247	103	14	186	345
v/c Ratio	1.24	0.69	0.03	0.51	0.20	0.06	0.65	0.56
Control Delay	155.1	17.1	25.6	19.6	4.9	17.0	31.1	6.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	155.1	17.1	25.6	19.6	4.9	17.0	31.1	6.7
Queue Length 50th (ft)	~154	104	2	57	0	2	49	0
Queue Length 95th (ft)	#399	#448	12	126	26	13	116	49
Internal Link Dist (ft)		1526		1340		663	4821	
Turn Bay Length (ft)	250		100		150			175
Base Capacity (vph)	348	984	291	717	711	312	285	614
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.24	0.69	0.02	0.34	0.14	0.04	0.65	0.56

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

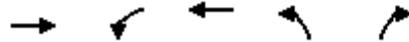
# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

# Queues

## 80: Evergreen Pkwy & 15th Ave

2/3/2012



Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	848	376	298	107	213
v/c Ratio	0.72	0.86	0.14	0.40	0.49
Control Delay	20.5	47.2	4.7	28.1	8.2
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	20.5	47.2	4.7	28.1	8.2
Queue Length 50th (ft)	120	129	16	36	0
Queue Length 95th (ft)	226	#362	46	78	46
Internal Link Dist (ft)	314		808	1077	
Turn Bay Length (ft)		325		150	
Base Capacity (vph)	1344	437	2275	301	456
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.63	0.86	0.13	0.36	0.47

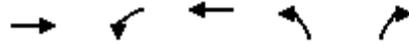
### Intersection Summary

# 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

# Queues

## 90: Evergreen Pkwy & 25th Ave

2/3/2012



Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	832	607	607	67	180
v/c Ratio	0.72	0.70	0.26	0.28	0.13
Control Delay	23.7	28.2	4.8	29.5	5.0
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	23.7	28.2	4.8	29.5	5.0
Queue Length 50th (ft)	146	110	37	25	9
Queue Length 95th (ft)	253	201	88	59	26
Internal Link Dist (ft)	808		520	298	
Turn Bay Length (ft)		325		225	
Base Capacity (vph)	1287	969	2474	400	1584
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.65	0.63	0.25	0.17	0.11

### Intersection Summary

Queues

220: US-26 WB Helvetia On-ramp & Helvetia Rd

2/3/2012



Lane Group	WBL	WBT	WBR	NBL	NBT	SBT
Lane Group Flow (vph)	677	680	43	59	344	511
v/c Ratio	0.83	0.83	0.05	0.34	0.44	0.44
Control Delay	24.6	24.6	6.0	31.3	16.3	22.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	24.6	24.6	6.0	31.3	16.3	22.9
Queue Length 50th (ft)	231	232	6	24	107	103
Queue Length 95th (ft)	350	352	18	58	186	157
Internal Link Dist (ft)		590			585	225
Turn Bay Length (ft)			25	150		
Base Capacity (vph)	922	925	892	186	780	1160
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.73	0.74	0.05	0.32	0.44	0.44

Intersection Summary

Queues

230: US-26 EB Helvetia Off-ramp & Helvetia Rd/Brookwood Pkwy

2/3/2012



Lane Group	EBT	EBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	68	192	346	511	44	1835
v/c Ratio	0.31	0.90	0.28	0.42	0.20	0.65
Control Delay	32.5	66.6	6.1	1.8	33.2	2.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	32.5	66.6	6.1	1.8	33.2	2.0
Queue Length 50th (ft)	27	62	58	0	17	110
Queue Length 95th (ft)	63	#178	108	33	m27	1
Internal Link Dist (ft)	1108		147			585
Turn Bay Length (ft)		300			175	
Base Capacity (vph)	218	214	1220	1227	516	2808
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.31	0.90	0.28	0.42	0.09	0.65

Intersection Summary

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

## Queues

### 231: US-26 EB Helvetia On-ramp &

2/3/2012



Lane Group	EBT
Lane Group Flow (vph)	549
v/c Ratio	0.16
Control Delay	0.1
Queue Delay	0.0
Total Delay	0.1
Queue Length 50th (ft)	0
Queue Length 95th (ft)	0
Internal Link Dist (ft)	963
Turn Bay Length (ft)	
Base Capacity (vph)	3539
Starvation Cap Reductn	0
Spillback Cap Reductn	0
Storage Cap Reductn	0
Reduced v/c Ratio	0.16
Intersection Summary	

Queues

270: Evergreen Pkwy & Brookwood Pkwy

2/3/2012



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	268	571	125	393	60	71	708	149	83	1089	905
v/c Ratio	0.49	0.62	0.36	0.51	0.16	0.34	0.57	0.22	0.38	0.86	0.55
Control Delay	38.1	29.7	42.1	32.8	8.9	43.1	26.9	5.7	43.1	35.9	6.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	38.1	29.7	42.1	32.8	8.9	43.1	26.9	5.7	43.1	35.9	6.3
Queue Length 50th (ft)	67	136	31	99	0	35	155	0	41	276	46
Queue Length 95th (ft)	123	191	69	150	27	86	291	39	97	#553	126
Internal Link Dist (ft)		1743		1977			1296			1006	
Turn Bay Length (ft)	475		250		375	175		350	475		350
Base Capacity (vph)	832	1489	443	1274	592	331	1258	665	332	1269	1721
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.32	0.38	0.28	0.31	0.10	0.21	0.56	0.22	0.25	0.86	0.53

Intersection Summary

# 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

## Queues

310: Evergreen Pkwy & 235th Ave

2/3/2012

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### Lane Group

Lane Group Flow (vph)

v/c Ratio

Control Delay

Queue Delay

Total Delay

Queue Length 50th (ft)

Queue Length 95th (ft)

Internal Link Dist (ft)

Turn Bay Length (ft)

Base Capacity (vph)

Starvation Cap Reductn

Spillback Cap Reductn

Storage Cap Reductn

Reduced v/c Ratio

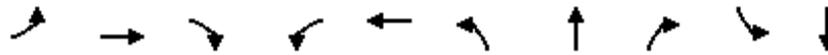
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### Intersection Summary

Queues

320: Evergreen Pkwy & 229th Ave

2/3/2012



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	17	416	96	607	837	118	79	298	45	34
v/c Ratio	0.20	0.46	0.20	0.97	0.39	1.57	0.43	0.32	0.31	0.13
Control Delay	54.5	31.7	8.5	62.4	11.8	348.0	45.8	2.6	48.0	28.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	54.5	31.7	8.5	62.4	11.8	348.0	45.8	2.6	48.0	28.7
Queue Length 50th (ft)	9	100	0	321	85	~92	43	0	23	14
Queue Length 95th (ft)	38	204	44	#849	300	#269	90	39	70	39
Internal Link Dist (ft)		914			1312		643			619
Turn Bay Length (ft)	100		375	250		150		250	100	
Base Capacity (vph)	83	1116	588	623	2213	75	183	946	518	609
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.20	0.37	0.16	0.97	0.38	1.57	0.43	0.32	0.09	0.06

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

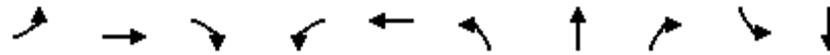
# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Queues

330: West Union Rd & Cornelius Pass Rd

2/3/2012



Lane Group	EBL	EBR	WBL	NBL	NBT	NBR	SBL	SBT		
Lane Group Flow (vph)	34	57	591	57	409	216	11	688		
v/c Ratio	0.30	0.31	0.19	0.80	0.40	0.39	0.17	0.11	0.49	
Control Delay	45.0	39.2	7.3	43.0	29.2	46.0	1.1	41.9	23.4	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	45.0	39.2	7.3	43.0	29.2	46.0	1.1	41.9	23.4	
Queue Length 50th (ft)	19	34	4	161	90	31	0	6	157	
Queue Length 95th (ft)	46	63	17	#254	143	66	#321	18	238	
Internal Link Dist (ft)		675		857		916		324		
Turn Bay Length (ft)	250	150	250		175		75			
Base Capacity (vph)	170	355	454	751	522	199	826	1243	186	1407
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.20	0.17	0.13	0.79	0.37	0.29	0.50	0.17	0.06	0.49

Intersection Summary

# 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

## Queues

340: Jacobson Rd & Cornelius Pass Rd

2/3/2012



Lane Group	WBT
Lane Group Flow (vph)	11
v/c Ratio	0.01
Control Delay	0.0
Queue Delay	0.0
Total Delay	0.0
Queue Length 50th (ft)	0
Queue Length 95th (ft)	0
Internal Link Dist (ft)	510
Turn Bay Length (ft)	
Base Capacity (vph)	1214
Starvation Cap Reductn	0
Spillback Cap Reductn	0
Storage Cap Reductn	0
Reduced v/c Ratio	0.01
<b>Intersection Summary</b>	

## Queues

350: Rock Creek Blvd & Cornelius Pass Rd

2/3/2012

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### Lane Group

Lane Group Flow (vph)

v/c Ratio

Control Delay

Queue Delay

Total Delay

Queue Length 50th (ft)

Queue Length 95th (ft)

Internal Link Dist (ft)

Turn Bay Length (ft)

Base Capacity (vph)

Starvation Cap Reductn

Spillback Cap Reductn

Storage Cap Reductn

Reduced v/c Ratio

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### Intersection Summary

# Queues

## 360: US-26 WB NB Corn Pass Off-ramp & Cornelius Pass Rd

2/3/2012



Lane Group	EBR	WBR2	NBL	NBT	SBT
Lane Group Flow (vph)	1339	256	78	833	1183
v/c Ratio	1.66	0.21	0.50	0.51	0.91
Control Delay	321.5	3.9	51.3	16.3	39.1
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	321.5	3.9	51.3	16.3	39.1
Queue Length 50th (ft)	~1079	3	44	158	343
Queue Length 95th (ft)	#1367	30	89	208	#495
Internal Link Dist (ft)				746	178
Turn Bay Length (ft)			325		
Base Capacity (vph)	808	1219	195	1743	1331
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	1.66	0.21	0.40	0.48	0.89

### Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.  
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.  
Queue shown is maximum after two cycles.

Queues

370: US-26 EB Corn Pass Off-ramp & Cornelius Pass Rd

2/3/2012



Lane Group	EBT	EBR	NBT	NBR	SBT
Lane Group Flow (vph)	178	210	756	557	2301
v/c Ratio	0.56	0.61	0.35	0.47	0.72
Control Delay	28.4	28.8	6.6	2.2	10.1
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	28.4	28.8	6.6	2.2	10.1
Queue Length 50th (ft)	61	70	54	0	166
Queue Length 95th (ft)	109	124	125	36	332
Internal Link Dist (ft)	307		1038		147
Turn Bay Length (ft)					
Base Capacity (vph)	397	430	2179	1191	3253
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.45	0.49	0.35	0.47	0.71

Intersection Summary



Lane Group	EBT
Lane Group Flow (vph)	557
v/c Ratio	0.16
Control Delay	0.1
Queue Delay	0.0
Total Delay	0.1
Queue Length 50th (ft)	0
Queue Length 95th (ft)	0
Internal Link Dist (ft)	1
Turn Bay Length (ft)	
Base Capacity (vph)	3438
Starvation Cap Reductn	0
Spillback Cap Reductn	0
Storage Cap Reductn	0
Reduced v/c Ratio	0.16
Intersection Summary	



Lane Group	EBT
Lane Group Flow (vph)	278
v/c Ratio	0.09
Control Delay	0.1
Queue Delay	0.0
Total Delay	0.1
Queue Length 50th (ft)	0
Queue Length 95th (ft)	0
Internal Link Dist (ft)	224
Turn Bay Length (ft)	
Base Capacity (vph)	3252
Starvation Cap Reductn	0
Spillback Cap Reductn	0
Storage Cap Reductn	0
Reduced v/c Ratio	0.09
Intersection Summary	

Queues

380: Evergreen Pkwy & Cornelius Pass Rd

2/3/2012



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	53	335	35	765	182	965	294	853	353
v/c Ratio	0.22	0.32	0.23	0.75	0.80	0.77	1.21	0.67	0.35
Control Delay	47.0	26.9	48.8	35.7	69.6	32.0	166.6	29.0	2.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	47.0	26.9	48.8	35.7	69.6	32.0	166.6	29.0	2.4
Queue Length 50th (ft)	17	84	22	224	118	286	~249	242	0
Queue Length 95th (ft)	35	125	51	292	#238	346	#408	295	32
Internal Link Dist (ft)		1463		1533		1423		1183	
Turn Bay Length (ft)	225		275		100		100		275
Base Capacity (vph)	693	1372	220	1112	228	1387	242	1406	1033
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.08	0.24	0.16	0.69	0.80	0.70	1.21	0.61	0.34

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

# Queues

## 390: Wagon Way & Cornelius Pass Rd

2/3/2012



Lane Group	EBR	NBL	NBT	SBT	SBR		
Lane Group Flow (vph)	68	205	909	1392	45		
v/c Ratio	0.07	0.31	0.06	0.55	0.34	0.64	0.04
Control Delay	31.0	11.1	30.4	42.9	4.7	15.6	8.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	31.0	11.1	30.4	42.9	4.7	15.6	8.1
Queue Length 50th (ft)	6	0	3	57	45	208	4
Queue Length 95th (ft)	16	28	11	87	189	#576	30
Internal Link Dist (ft)	331		22		749	732	
Turn Bay Length (ft)			300				125
Base Capacity (vph)	552	634	353	611	2674	2174	1008
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.02	0.11	0.02	0.34	0.34	0.64	0.04

### Intersection Summary

# 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

# PM Queuing

## Queues

### 41: US-26 EB JS Rd On-ramp &

2/3/2012

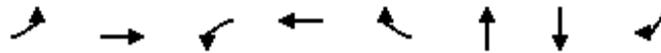


Lane Group	EBT
Lane Group Flow (vph)	709
v/c Ratio	0.20
Control Delay	0.1
Queue Delay	0.0
Total Delay	0.1
Queue Length 50th (ft)	0
Queue Length 95th (ft)	0
Internal Link Dist (ft)	1022
Turn Bay Length (ft)	
Base Capacity (vph)	3574
Starvation Cap Reductn	0
Spillback Cap Reductn	0
Storage Cap Reductn	0
Reduced v/c Ratio	0.20
<b>Intersection Summary</b>	

# Queues

## 70: Evergreen Pkwy & Jackson School Rd

2/3/2012



Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	SBT	SBR
Lane Group Flow (vph)	346	398	11	769	352	18	109	352
v/c Ratio	1.19	0.34	0.06	0.98	0.41	0.09	0.49	0.63
Control Delay	142.2	8.9	28.9	49.4	4.0	16.8	30.3	8.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	142.2	8.9	28.9	49.4	4.0	16.8	30.3	8.6
Queue Length 50th (ft)	~155	48	4	259	4	2	37	0
Queue Length 95th (ft)	#343	203	18	#577	55	16	77	58
Internal Link Dist (ft)		1526		1340		663	4821	
Turn Bay Length (ft)	250		100		150			175
Base Capacity (vph)	291	1154	251	784	860	259	240	569
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.19	0.34	0.04	0.98	0.41	0.07	0.45	0.62

### Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

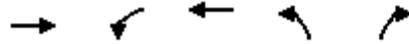
# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

# Queues

## 80: Evergreen Pkwy & 15th Ave

2/3/2012



Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	483	267	824	341	472
v/c Ratio	0.52	0.63	0.39	0.95	0.67
Control Delay	18.3	28.6	6.8	63.2	7.9
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	18.3	28.6	6.8	63.2	7.9
Queue Length 50th (ft)	60	71	54	~128	0
Queue Length 95th (ft)	121	#204	132	210	58
Internal Link Dist (ft)	314		808	1077	
Turn Bay Length (ft)		325		150	
Base Capacity (vph)	1376	475	2410	358	701
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.35	0.56	0.34	0.95	0.67

### Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

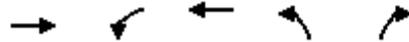
# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

# Queues

## 90: Evergreen Pkwy & 25th Ave

2/3/2012



Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	864	165	858	233	830
v/c Ratio	0.75	0.33	0.42	0.50	0.58
Control Delay	24.3	28.0	8.8	26.2	12.5
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	24.3	28.0	8.8	26.2	12.5
Queue Length 50th (ft)	160	32	98	79	113
Queue Length 95th (ft)	238	59	131	157	176
Internal Link Dist (ft)	808		520	298	
Turn Bay Length (ft)		325		225	
Base Capacity (vph)	1290	866	2293	509	1650
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.67	0.19	0.37	0.46	0.50

### Intersection Summary

Queues

220: US-26 WB Helvetia On-ramp & Helvetia Rd

2/3/2012



Lane Group	WBL	WBT	WBR	NBL	NBT	SBT
Lane Group Flow (vph)	336	338	59	204	919	334
v/c Ratio	0.80	0.80	0.14	0.54	0.81	0.22
Control Delay	40.4	40.6	14.5	22.9	22.5	12.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	40.4	40.6	14.5	22.9	22.5	12.4
Queue Length 50th (ft)	138	140	11	80	419	39
Queue Length 95th (ft)	#262	#264	38	m77	#580	74
Internal Link Dist (ft)		590			585	225
Turn Bay Length (ft)			25	150		
Base Capacity (vph)	451	452	442	689	1135	1501
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.75	0.75	0.13	0.30	0.81	0.22

Intersection Summary

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Queues

230: US-26 EB Helvetia Off-ramp & Helvetia Rd/Brookwood Pkwy

2/3/2012



Lane Group	EBT	EBR	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	64	62	1026	812	16	880
v/c Ratio	0.35	0.28	0.71	0.57	0.11	0.31
Control Delay	34.2	12.1	11.8	2.4	34.8	1.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.2	12.1	11.8	2.4	34.8	1.3
Queue Length 50th (ft)	26	0	175	0	7	35
Queue Length 95th (ft)	59	31	#663	42	m12	1
Internal Link Dist (ft)	1108		147			585
Turn Bay Length (ft)		300			175	
Base Capacity (vph)	233	262	1445	1417	232	2884
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.27	0.24	0.71	0.57	0.07	0.31

Intersection Summary

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

## Queues

### 231: US-26 EB Helvetia On-ramp &

2/3/2012



Lane Group	EBT
Lane Group Flow (vph)	864
v/c Ratio	0.24
Control Delay	0.2
Queue Delay	0.0
Total Delay	0.2
Queue Length 50th (ft)	0
Queue Length 95th (ft)	0
Internal Link Dist (ft)	963
Turn Bay Length (ft)	
Base Capacity (vph)	3610
Starvation Cap Reductn	0
Spillback Cap Reductn	0
Storage Cap Reductn	0
Reduced v/c Ratio	0.24
Intersection Summary	

Queues

270: Evergreen Pkwy & Brookwood Pkwy

2/3/2012



Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	674	787	191	551	129	112	1045	107	73	753	258
v/c Ratio	0.90	0.64	0.50	0.66	0.27	0.48	0.88	0.20	0.38	0.72	0.16
Control Delay	55.8	30.2	49.0	39.5	7.3	49.9	43.2	7.1	50.0	37.8	2.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	55.8	30.2	49.0	39.5	7.3	49.9	43.2	7.1	50.0	37.8	2.2
Queue Length 50th (ft)	222	223	60	172	0	68	337	0	45	225	0
Queue Length 95th (ft)	#402	306	108	239	44	134	#557	42	97	347	22
Internal Link Dist (ft)		1368		1977			1296			1006	
Turn Bay Length (ft)	475		250		375	175		350	475		350
Base Capacity (vph)	751	1468	433	1155	605	309	1187	568	299	1115	1689
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.90	0.54	0.44	0.48	0.21	0.36	0.88	0.19	0.24	0.68	0.15

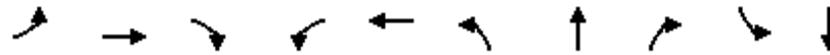
Intersection Summary

# 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

Queues

310: Evergreen Pkwy & 235th Ave

2/3/2012



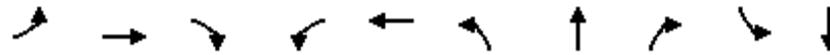
Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	17	1017	6	6	890	17	18	47	41	72
v/c Ratio	0.11	0.48	0.01	0.04	0.43	0.10	0.10	0.17	0.20	0.23
Control Delay	26.9	10.0	7.0	27.2	9.6	17.7	17.5	7.9	18.5	7.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	26.9	10.0	7.0	27.2	9.6	17.7	17.5	7.9	18.5	7.5
Queue Length 50th (ft)	3	58	0	1	48	3	3	0	7	0
Queue Length 95th (ft)	25	266	6	13	229	21	22	22	36	27
Internal Link Dist (ft)		1977			982		616			1323
Turn Bay Length (ft)	275		200	250		350		350	150	
Base Capacity (vph)	223	2349	1064	217	2317	279	312	435	340	466
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.08	0.43	0.01	0.03	0.38	0.06	0.06	0.11	0.12	0.15

Intersection Summary

Queues

320: Evergreen Pkwy & 229th Ave

2/3/2012



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	11	840	117	234	664	90	43	670	181	70
v/c Ratio	0.17	0.85	0.22	0.48	0.32	0.71	0.30	0.83	0.67	0.19
Control Delay	65.7	47.2	8.1	39.9	14.5	84.3	52.3	27.8	56.8	30.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	65.7	47.2	8.1	39.9	14.5	84.3	52.3	27.8	56.8	30.7
Queue Length 50th (ft)	7	265	0	126	91	~80	28	258	113	35
Queue Length 95th (ft)	32	#584	52	291	288	#244	66	484	231	70
Internal Link Dist (ft)		914			1312		643			619
Turn Bay Length (ft)	100		375	250		150		250	100	
Base Capacity (vph)	66	1012	541	492	2085	126	144	803	521	607
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.17	0.83	0.22	0.48	0.32	0.71	0.30	0.83	0.35	0.12

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

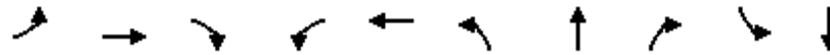
# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Queues

330: West Union Rd & Cornelius Pass Rd

2/3/2012



Lane Group	EBL	EBR	WBL	NBL	NBT	NBR	SBL	SBT		
Lane Group Flow (vph)	119	98	232	62	876	701	26	438		
v/c Ratio	0.48	0.66	0.21	0.55	0.33	0.47	0.92	0.57	0.24	0.28
Control Delay	48.5	49.6	3.8	45.7	32.5	62.9	30.9	3.1	49.4	19.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.5	49.6	3.8	45.7	32.5	62.9	30.9	3.1	49.4	19.5
Queue Length 50th (ft)	73	122	0	72	48	40	159	0	16	90
Queue Length 95th (ft)	131	185	21	108	88	m61	m#913	m82	42	152
Internal Link Dist (ft)		675		857		916				324
Turn Bay Length (ft)	250		150	250		175		75		
Base Capacity (vph)	260	409	590	521	420	168	949	1229	175	1554
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.46	0.49	0.17	0.45	0.23	0.37	0.92	0.57	0.15	0.28

Intersection Summary

# 95th percentile volume exceeds capacity, queue may be longer.

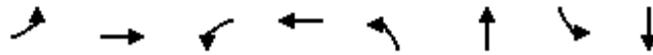
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Queues

340: Jacobson Rd & Cornelius Pass Rd

2/3/2012



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	364	229	33	10	43	1424	11	767
v/c Ratio	0.98	0.40	0.14	0.02	0.34	0.65	0.10	0.40
Control Delay	80.5	8.8	30.1	21.0	65.5	6.6	59.9	7.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	80.5	8.8	30.1	21.0	65.5	6.6	59.9	7.4
Queue Length 50th (ft)	231	16	16	2	24	43	8	127
Queue Length 95th (ft)	#416	75	42	15	m50	10	m23	127
Internal Link Dist (ft)		1101		510		1272		916
Turn Bay Length (ft)	200		100		300		125	
Base Capacity (vph)	371	576	232	470	164	2177	181	1933
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.98	0.40	0.14	0.02	0.26	0.65	0.06	0.40

Intersection Summary

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

# Queues

## 350: Rock Creek Blvd & Cornelius Pass Rd

2/3/2012



Lane Group	WBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	186	1456	379	66	890
v/c Ratio	0.47	0.60	0.27	0.43	0.33
Control Delay	39.8	14.3	1.6	40.6	4.7
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	39.8	14.3	1.6	40.6	4.7
Queue Length 50th (ft)	53	312	0	41	109
Queue Length 95th (ft)	76	596	96	86	186
Internal Link Dist (ft)	460	732			1272
Turn Bay Length (ft)	175		200	200	
Base Capacity (vph)	795	2412	1535	186	2715
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.23	0.60	0.25	0.35	0.33

### Intersection Summary

# Queues

## 360: US-26 WB NB Corn Pass Off-ramp & Cornelius Pass Rd

2/3/2012



Lane Group	EBR	WBR2	NBL	NBT	SBT
Lane Group Flow (vph)	722	309	278	1598	1026
v/c Ratio	0.95	0.31	1.22	0.85	0.82
Control Delay	39.7	19.0	170.5	23.7	32.3
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	39.7	19.0	170.5	23.7	32.3
Queue Length 50th (ft)	274	64	~222	415	286
Queue Length 95th (ft)	#524	100	#379	524	367
Internal Link Dist (ft)				746	178
Turn Bay Length (ft)			325		
Base Capacity (vph)	806	1089	227	1953	1354
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.90	0.28	1.22	0.82	0.76

### Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.  
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.  
Queue shown is maximum after two cycles.

# Queues

## 370: US-26 EB Corn Pass Off-ramp & Cornelius Pass Rd

2/3/2012



Lane Group	EBT	EBR	NBT	NBR	SBT
Lane Group Flow (vph)	170	129	1706	948	1438
v/c Ratio	0.53	0.39	0.72	0.69	0.42
Control Delay	27.5	17.1	10.7	3.7	6.2
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	27.5	17.1	10.7	3.7	6.2
Queue Length 50th (ft)	56	26	161	0	68
Queue Length 95th (ft)	104	64	#422	48	168
Internal Link Dist (ft)	307		1038		147
Turn Bay Length (ft)					
Base Capacity (vph)	435	428	2370	1373	3405
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.39	0.30	0.72	0.69	0.42

### Intersection Summary

# 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.



Lane Group	EBT
Lane Group Flow (vph)	948
v/c Ratio	0.27
Control Delay	0.2
Queue Delay	0.0
Total Delay	0.2
Queue Length 50th (ft)	0
Queue Length 95th (ft)	0
Internal Link Dist (ft)	1
Turn Bay Length (ft)	
Base Capacity (vph)	3539
Starvation Cap Reductn	0
Spillback Cap Reductn	0
Storage Cap Reductn	0
Reduced v/c Ratio	0.27
Intersection Summary	



Lane Group	EBT
Lane Group Flow (vph)	309
v/c Ratio	0.09
Control Delay	0.1
Queue Delay	0.0
Total Delay	0.1
Queue Length 50th (ft)	0
Queue Length 95th (ft)	0
Internal Link Dist (ft)	224
Turn Bay Length (ft)	
Base Capacity (vph)	3438
Starvation Cap Reductn	0
Spillback Cap Reductn	0
Storage Cap Reductn	0
Reduced v/c Ratio	0.09
Intersection Summary	

Queues

380: Evergreen Pkwy & Cornelius Pass Rd

2/3/2012



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	396	1063	83	797	57	1198	240	1026	26
v/c Ratio	0.74	0.85	0.60	0.81	0.46	1.01	1.46	0.77	0.03
Control Delay	57.4	43.4	72.6	38.3	66.6	69.6	278.6	40.0	7.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	57.4	43.4	72.6	38.3	66.6	69.6	278.6	40.0	7.0
Queue Length 50th (ft)	158	404	65	233	45	~558	~271	403	0
Queue Length 95th (ft)	206	498	120	327	90	#707	#440	#547	17
Internal Link Dist (ft)		1463		1533		1423		1183	
Turn Bay Length (ft)	225		275		100		100		275
Base Capacity (vph)	716	1303	161	1024	159	1181	164	1331	750
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.55	0.82	0.52	0.78	0.36	1.01	1.46	0.77	0.03

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Queues

390: Wagon Way & Cornelius Pass Rd

2/3/2012



Lane Group	EBR	NBL	NBT	SBL	SBT	SBR		
Lane Group Flow (vph)	258	216	1731	2	974	32		
v/c Ratio	0.22	0.65	0.05	0.58	0.63	0.02	0.44	0.03
Control Delay	40.2	12.3	30.3	48.3	9.8	48.0	5.6	2.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	40.2	12.3	30.3	48.3	9.8	48.0	5.6	2.1
Queue Length 50th (ft)	21	0	4	68	127	1	21	0
Queue Length 95th (ft)	40	58	15	102	#711	m3	200	8
Internal Link Dist (ft)	331		22		749		732	
Turn Bay Length (ft)			300		100			125
Base Capacity (vph)	564	776	609	399	2728	217	2229	1014
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.06	0.33	0.01	0.54	0.63	0.01	0.44	0.03

Intersection Summary

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

# Appendix E-2. Freeway Operations

AM Merge/Diverge Operations

<b>Interchange</b>	<b>Direction</b>	<b>Location</b>	<b>Merge/ Diverge</b>	<b>HCS Volume</b>	<b>Capacity</b>	<b>V/C</b>
59 - Jackson School Rd	WB	Mainline		1183	4600	0.26
	WB	OFF	Diverge	491	2000	0.25
	WB	Mainline		740	4600	0.16
	WB	ON	Merge	784	4600	0.17
	WB	Mainline		784	4600	0.17
	EB	Mainline		1588	4600	0.35
	EB	OFF	Diverge	95	2000	0.05
	EB	Mainline		1495	4600	0.33
	EB	ON	Merge	2189	4600	0.48
	EB	Mainline		2189	4600	0.48
61 - Brookwood Pkwy / Helvetia Rd	WB	Mainline		2578	4600	0.56
	WB	OFF	Diverge	1617	2000	0.81
	WB	Mainline		1121	4600	0.24
	WB	ON	Merge	1189	4600	0.26
	WB	Mainline		1189	4600	0.26
	EB	Mainline		2173	4600	0.47
	EB	OFF	Diverge	213	2000	0.11
	EB	Mainline		1965	4600	0.43
	EB	ON	Merge	2528	4600	0.55
	EB	Mainline		2528	4600	0.55
62 - Cornelius Pass Rd	WB	Mainline		3856	4600	0.84
	WB	OFF	Diverge	286	2000	0.14
	WB	Mainline		3598	4600	0.78
	WB	OFF	Diverge	1499	2000	0.75
	WB	Mainline		2247	4600	0.49
	WB	ON	Merge	2614	4600	0.57
	WB	Mainline		2614	4600	0.57
	EB	Mainline		2515	4600	0.55
	EB	OFF	Diverge	95	2000	0.05
	EB	Mainline		2420	4600	0.53
	EB	ON	Merge	2412	4600	0.52
	EB	Mainline		2412	4600	0.52
	EB	ON	Merge	2957	4600	0.64
	EB	Mainline		2957	4600	0.64

PM Merge/Diverge Operations

Interchange	Direction	Location	Merge/	HCS	Capacity	V/C
			Diverge	Volume		
59 - Jackson School Rd	WB	Mainline		2248	4600	0.49
	WB	OFF	Diverge	611	2000	0.31
	WB	Mainline		1643	4600	0.36
	WB	ON	Merge	1725	4600	0.38
	WB	Mainline		1725	4600	0.38
	EB	Mainline		1152	4600	0.25
	EB	OFF	Diverge	31	2000	0.02
	EB	Mainline		1121	4600	0.24
	EB	ON	Merge	1759	4600	0.38
	EB	Mainline		1759	4600	0.38
61 - Brookwood Pkwy / Helvetia Rd	WB	Mainline		2729	4600	0.59
	WB	OFF	Diverge	791	2000	0.40
	WB	Mainline		1945	4600	0.42
	WB	ON	Merge	2251	4600	0.49
	WB	Mainline		2251	4600	0.49
	EB	Mainline		1786	4600	0.39
	EB	OFF	Diverge	136	2000	0.07
	EB	Mainline		1650	4600	0.36
	EB	ON	Merge	2482	4600	0.54
	EB	Mainline		2482	4600	0.54
62 - Cornelius Pass Rd	WB	Mainline		3323	4600	0.72
	WB	OFF	Diverge	327	2000	0.16
	WB	Mainline		2999	4600	0.65
	WB	OFF	Diverge	764	2000	0.38
	WB	Mainline		2242	4600	0.49
	WB	ON	Merge	2733	4600	0.59
	WB	Mainline		2733	4600	0.59
	EB	Mainline		2518	4600	0.55
	EB	OFF	Diverge	304	2000	0.15
	EB	Mainline		2214	4600	0.48
	EB	ON	Merge	2515	4600	0.55
	EB	Mainline		2529	4600	0.55
	EB	ON	Merge	3492	4600	0.76
EB	Mainline		3492	4600	0.76	

# AM Operations

Phone: Fax:  
E-mail:

-----Merge Analysis-----

Analyst: Josh Anderson  
 Agency/Co.: David Evans & Associates, Inc.  
 Date performed: 12/21/2011  
 Analysis time period: AM Peak Period  
 Freeway/Dir of Travel: US 26 Westbound  
 Junction: Cornelius Pass Rd Interchange  
 Jurisdiction: ODOT  
 Analysis Year: 2011  
 Description: Westbound On-ramp from Cornelius Pass Rd

-----Freeway Data-----

Type of analysis	Merge		
Number of lanes in freeway	2		
Free-flow speed on freeway	60.0	mph	
Volume on freeway	2005	vph	

-----On Ramp Data-----

Side of freeway	Right		
Number of lanes in ramp	1		
Free-flow speed on ramp	35.0	mph	
Volume on ramp	295	vph	
Length of first accel/decel lane	450	ft	
Length of second accel/decel lane		ft	

-----Adjacent Ramp Data (if one exists)-----

Does adjacent ramp exist?	No		
Volume on adjacent Ramp		vph	
Position of adjacent Ramp			
Type of adjacent Ramp			
Distance to adjacent Ramp		ft	

-----Conversion to pc/h Under Base Conditions-----

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2005	295		vph
Peak-hour factor, PHF	0.91	0.82		
Peak 15-min volume, v15	551	90		v
Trucks and buses	4	4		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade		%	%	%
Length		mi	mi	mi
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.980	0.980	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	2247	367	pcph

----- Estimation of V12 Merge Areas -----

L = (Equation 25-2 or 25-3)

EQ

P = 1.000 Using Equation 0

FM

v = v (P ) = 2247 pc/h

12 F FM

----- Capacity Checks -----

	Actual	Maximum	LOS F?
v	2614	4600	No
FO			
v	0 pc/h	(Equation 25-4 or 25-5)	
3 or av34			
Is v v > 2700 pc/h?		No	
3 or av34			
Is v v > 1.5 v /2		No	
3 or av34	12		
If yes, v =		(Equation 25-8)	
12A			

----- Flow Entering Merge Influence Area -----

	Actual	Max Desirable	Violation?
v	2247	4400	No
12			!

----- Level of Service Determination (if not F) -----

Density, D = 5.475 + 0.00734 v<sub>R</sub> + 0.0078 v<sub>12</sub> - 0.00627 L<sub>A</sub> = 22.9 pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

----- Speed Estimation -----

Intermediate speed variable,	M = 0.343	
	S	
Space mean speed in ramp influence area,	S = 53.8	mph
	R	
Space mean speed in outer lanes,	S = N/A	mph
	0	
Space mean speed for all vehicles,	S = 53.8	mph

Phone: Fax:  
E-mail:

-----Diverge Analysis-----

Analyst: Josh Anderson  
Agency/Co.: David Evans & Associates, Inc.  
Date performed: 12/21/2011  
Analysis time period: AM Peak  
Freeway/Dir of Travel: US 26 Eastbound  
Junction: Cornelius Pass Rd Interchange  
Jurisdiction: ODOT  
Analysis Year: 2011  
Description: Eastbound Off-ramp to Cornelius Pass Rd

-----Freeway Data-----

Type of analysis	Diverge		
Number of lanes in freeway	2		
Free-flow speed on freeway	60.0	mph	
Volume on freeway	2170	vph	

-----Off Ramp Data-----

Side of freeway	Right		
Number of lanes in ramp	1		
Free-Flow speed on ramp	35.0	mph	
Volume on ramp	325	vph	
Length of first accel/decel lane	1500	ft	
Length of second accel/decel lane		ft	

-----Adjacent Ramp Data (if one exists)-----

Does adjacent ramp exist?	No		
Volume on adjacent ramp		vph	
Position of adjacent ramp			
Type of adjacent ramp			
Distance to adjacent ramp		ft	

-----Conversion to pc/h Under Base Conditions-----

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2170	325		vph
Peak-hour factor, PHF	0.88	0.86		
Peak 15-min volume, v15	616	94		v
Trucks and buses	4	4		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.980	0.980	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	2515	385	pcph

----- Estimation of V12 Diverge Areas -----

L = (Equation 25-8 or 25-9)  
 EQ  
 P = 1.000 Using Equation 0  
 FD  
 $v_{12} = v_R + (v_F - v_R) P = 2515$  pc/h  
 12 R F R FD

----- Capacity Checks -----

	Actual	Maximum	LOS F?
$v_{12} = v_{12}$	2515	4600	No
$v_{FO} = v_{FO} - v_{R3}$	2130	4600	No
$v_{R3}$	385	2000	No
$v_{3 \text{ or } av34}$	0 pc/h	(Equation 25-15 or 25-16)	
Is $v_{3 \text{ or } av34} > 2700$ pc/h?		No	
Is $v_{3 \text{ or } av34} > 1.5 v_{12} / 2$		No	
If yes, $v_{12A} =$		(Equation 25-18)	

----- Flow Entering Diverge Influence Area -----

	Actual	Max Desirable	Violation?
$v_{12}$	2515	4600	No

----- Level of Service Determination (if not F) -----

Density,  $D = 4.252 + 0.0086 v_{12} - 0.009 L_D = 12.4$  pc/mi/ln  
 Level of service for ramp-freeway junction areas of influence B

----- Speed Estimation -----

Intermediate speed variable,	D = 0.463	
Space mean speed in ramp influence area,	S <sub>R</sub> = 51.7	mph
Space mean speed in outer lanes,	S <sub>0</sub> = N/A	mph
Space mean speed for all vehicles,	S = 51.7	mph

Phone: Fax:  
E-mail:

-----Merge Analysis-----

Analyst: Josh Anderson  
 Agency/Co.: David Evans & Associates, Inc.  
 Date performed: 12/21/2011  
 Analysis time period: AM Peak Period  
 Freeway/Dir of Travel: US 26 Eastbound  
 Junction: Cornelius Pass Rd Interchange  
 Jurisdiction: ODOT  
 Analysis Year: 2011  
 Description: Northbound to Eastbound On-ramp from Cornelius Pass Rd

-----Freeway Data-----

Type of analysis	Merge		
Number of lanes in freeway	2		
Free-flow speed on freeway	60.0	mph	
Volume on freeway	2075	vph	

-----On Ramp Data-----

Side of freeway	Right		
Number of lanes in ramp	1		
Free-flow speed on ramp	35.0	mph	
Volume on ramp	465	vph	
Length of first accel/decel lane	500	ft	
Length of second accel/decel lane		ft	

-----Adjacent Ramp Data (if one exists)-----

Does adjacent ramp exist?	No		
Volume on adjacent Ramp		vph	
Position of adjacent Ramp			
Type of adjacent Ramp			
Distance to adjacent Ramp		ft	

-----Conversion to pc/h Under Base Conditions-----

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2075	465		vph
Peak-hour factor, PHF	0.88	0.86		
Peak 15-min volume, v15	589	135		v
Trucks and buses	4	4		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade		%	%	%
Length		mi	mi	mi
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.980	0.980	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	2405	552	pcph

----- Estimation of V12 Merge Areas -----

L = (Equation 25-2 or 25-3)

EQ

P = 1.000 Using Equation 0

FM

v = v (P ) = 2405 pc/h

12 F FM

----- Capacity Checks -----

		Actual	Maximum	LOS F?
v		2957	4600	No
FO				
v	v	0 pc/h	(Equation 25-4 or 25-5)	
3 or av34				
Is v	v	> 2700 pc/h?	No	
3 or av34				
Is v	v	> 1.5 v /2	No	
3 or av34		12		
If yes, v	=		(Equation 25-8)	
12A				

----- Flow Entering Merge Influence Area -----

	Actual	Max Desirable	Violation?
v	2405	4400	No
12			

----- Level of Service Determination (if not F) -----

Density, D = 5.475 + 0.00734 v<sub>R</sub> + 0.0078 v<sub>12</sub> - 0.00627 L<sub>A</sub> = 25.2 pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

----- Speed Estimation -----

Intermediate speed variable,	M = 0.361	
	S	
Space mean speed in ramp influence area,	S = 53.5	mph
	R	
Space mean speed in outer lanes,	S = N/A	mph
	0	
Space mean speed for all vehicles,	S = 53.5	mph

Phone: Fax:  
E-mail:

-----Merge Analysis-----

Analyst: Josh Anderson  
Agency/Co.: David Evans & Associates, Inc.  
Date performed: 12/21/2011  
Analysis time period: AM Peak Period  
Freeway/Dir of Travel: US 26 Eastbound  
Junction: Cornelius Pass Rd Interchange  
Jurisdiction: ODOT  
Analysis Year: 2011  
Description: Southbound to Eastbound On-ramp from Cornelius Pass Rd

-----Freeway Data-----

Type of analysis	Merge		
Number of lanes in freeway	2		
Free-flow speed on freeway	60.0	mph	
Volume on freeway	1845	vph	

-----On Ramp Data-----

Side of freeway	Right		
Number of lanes in ramp	1		
Free-flow speed on ramp	35.0	mph	
Volume on ramp	230	vph	
Length of first accel/decel lane	250	ft	
Length of second accel/decel lane		ft	

-----Adjacent Ramp Data (if one exists)-----

Does adjacent ramp exist?	No		
Volume on adjacent Ramp		vph	
Position of adjacent Ramp			
Type of adjacent Ramp			
Distance to adjacent Ramp		ft	

-----Conversion to pc/h Under Base Conditions-----

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1845	230		vph
Peak-hour factor, PHF	0.88	0.86		
Peak 15-min volume, v15	524	67		v
Trucks and buses	4	4		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	%	%	%	%
Length	mi	mi	mi	mi
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.980	0.980	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	2139	273	pcph

----- Estimation of V12 Merge Areas -----

L = (Equation 25-2 or 25-3)

EQ

P = 1.000 Using Equation 0

FM

v = v (P ) = 2139 pc/h

12 F FM

----- Capacity Checks -----

		Actual	Maximum	LOS F?
v		2412	4600	No
FO				
v	v	0 pc/h	(Equation 25-4 or 25-5)	
3 or av34				
Is v	v	> 2700 pc/h?	No	
3 or av34				
Is v	v	> 1.5 v /2	No	
3 or av34		12		
If yes, v	=		(Equation 25-8)	
12A				

----- Flow Entering Merge Influence Area -----

	Actual	Max Desirable	Violation?
v	2139	4400	No
12			

----- Level of Service Determination (if not F) -----

Density, D = 5.475 + 0.00734 v<sub>R</sub> + 0.0078 v<sub>12</sub> - 0.00627 L<sub>A</sub> = 22.6 pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

----- Speed Estimation -----

Intermediate speed variable,	M = 0.347	
	S	
Space mean speed in ramp influence area,	S = 53.8	mph
	R	
Space mean speed in outer lanes,	S = N/A	mph
	0	
Space mean speed for all vehicles,	S = 53.8	mph

Phone: Fax:  
E-mail:

-----Diverge Analysis-----

Analyst: Josh Anderson  
 Agency/Co.: David Evans & Associates, Inc.  
 Date performed: 12/21/2011  
 Analysis time period: AM Peak  
 Freeway/Dir of Travel: US 26 Westbound  
 Junction: Cornelius Pass Rd Interchange  
 Jurisdiction: ODOT  
 Analysis Year: 2011  
 Description: Westbound LOOP Off-ramp to Cornelius Pass Rd

-----Freeway Data-----

Type of analysis	Diverge		
Number of lanes in freeway	2		
Free-flow speed on freeway	60.0	mph	
Volume on freeway	3210	vph	

-----Off Ramp Data-----

Side of freeway	Right		
Number of lanes in ramp	1		
Free-Flow speed on ramp	35.0	mph	
Volume on ramp	1205	vph	
Length of first accel/decel lane	1500	ft	
Length of second accel/decel lane		ft	

-----Adjacent Ramp Data (if one exists)-----

Does adjacent ramp exist?	No		
Volume on adjacent ramp		vph	
Position of adjacent ramp			
Type of adjacent ramp			
Distance to adjacent ramp		ft	

-----Conversion to pc/h Under Base Conditions-----

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	3210	1205		vph
Peak-hour factor, PHF	0.91	0.82		
Peak 15-min volume, v15	882	367		v
Trucks and buses	4	4		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.980	0.980	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	3598	1499	pcph

----- Estimation of V12 Diverge Areas -----

L = (Equation 25-8 or 25-9)  
EQ  
P = 1.000 Using Equation 0  
FD  
 $v_{12} = v_R + (v_F - v_R) P = 3598 \text{ pc/h}$

----- Capacity Checks -----

	Actual	Maximum	LOS F?
$v = v_{12}$	3598	4600	No
$v_{FO} = v_F - v_R$	2099	4600	No
$v_R$	1499	2000	No
$v_3 \text{ or } v_{av34}$	0 pc/h	(Equation 25-15 or 25-16)	
Is $v_3 \text{ or } v_{av34} > 2700 \text{ pc/h?}$		No	
Is $v_3 \text{ or } v_{av34} > 1.5 v_{12} / 2$		No	
If yes, $v_{12A} =$		(Equation 25-18)	

----- Flow Entering Diverge Influence Area -----

	Actual	Max Desirable	Violation?
$v_{12}$	3598	4600	No

----- Level of Service Determination (if not F) -----

Density,  $D = 4.252 + 0.0086 v_{12} - 0.009 L_D = 21.7 \text{ pc/mi/ln}$   
Level of service for ramp-freeway junction areas of influence C

----- Speed Estimation -----

Intermediate speed variable,	D = 0.563	
Space mean speed in ramp influence area,	S <sub>R</sub> = 49.9	mph
Space mean speed in outer lanes,	S <sub>0</sub> = N/A	mph
Space mean speed for all vehicles,	S = 49.9	mph

Phone: Fax:  
E-mail:

-----Diverge Analysis-----

Analyst: Josh Anderson  
Agency/Co.: David Evans & Associates, Inc.  
Date performed: 12/21/2011  
Analysis time period: AM Peak  
Freeway/Dir of Travel: US 26 Westbound  
Junction: Cornelius Pass Rd Interchange  
Jurisdiction: ODOT  
Analysis Year: 2011  
Description: Westbound Off-ramp to Cornelius Pass Rd

-----Freeway Data-----

Type of analysis	Diverge		
Number of lanes in freeway	2		
Free-flow speed on freeway	60.0	mph	
Volume on freeway	3440	vph	

-----Off Ramp Data-----

Side of freeway	Right		
Number of lanes in ramp	1		
Free-Flow speed on ramp	35.0	mph	
Volume on ramp	230	vph	
Length of first accel/decel lane	1500	ft	
Length of second accel/decel lane		ft	

-----Adjacent Ramp Data (if one exists)-----

Does adjacent ramp exist?	No		
Volume on adjacent ramp		vph	
Position of adjacent ramp			
Type of adjacent ramp			
Distance to adjacent ramp		ft	

-----Conversion to pc/h Under Base Conditions-----

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	3440	230		vph
Peak-hour factor, PHF	0.91	0.82		
Peak 15-min volume, v15	945	70		v
Trucks and buses	4	4		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.980	0.980	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	3856	286	pcph

----- Estimation of V12 Diverge Areas -----

L = (Equation 25-8 or 25-9)

EQ

P = 1.000 Using Equation 0

FD

$v_{12} = v_R + (v_F - v_R) P = 3856$  pc/h

12 R F R FD

----- Capacity Checks -----

	Actual	Maximum	LOS F?
$v_{12} = v_{12}$	3856	4600	No
$v_{FO} = v_{FO} - v_{R3}$	3570	4600	No
$v_{R3}$	286	2000	No
$v_{3} = v_{3}$	0 pc/h	(Equation 25-15 or 25-16)	
Is $v_{3} > 2700$ pc/h?		No	
Is $v_{12} > 1.5 v_{12} / 2$		No	
If yes, $v_{12A} =$		(Equation 25-18)	

----- Flow Entering Diverge Influence Area -----

	Actual	Max Desirable	Violation?
$v_{12}$	3856	4600	No

----- Level of Service Determination (if not F) -----

Density,  $D = 4.252 + 0.0086 v_{12} - 0.009 L = 23.9$  pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

----- Speed Estimation -----

Intermediate speed variable,	D = 0.454	
Space mean speed in ramp influence area,	S = 51.8	mph
Space mean speed in outer lanes,	S = N/A	mph
Space mean speed for all vehicles,	S = 51.8	mph

Phone: Fax:  
E-mail:

-----Merge Analysis-----

Analyst: Josh Anderson  
 Agency/Co.: David Evans & Associates, Inc.  
 Date performed: 10/14/2011  
 Analysis time period: AM Peak Period  
 Freeway/Dir of Travel: US 26 Westbound  
 Junction: Brookwood Interchange  
 Jurisdiction: ODOT  
 Analysis Year: 2011  
 Description: Westbound On-ramp from Brookwood

-----Freeway Data-----

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	60.0	mph
Volume on freeway	1000	vph

-----On Ramp Data-----

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	55	vph
Length of first accel/decel lane	410	ft
Length of second accel/decel lane		ft

-----Adjacent Ramp Data (if one exists)-----

Does adjacent ramp exist?	No	
Volume on adjacent Ramp		vph
Position of adjacent Ramp		
Type of adjacent Ramp		
Distance to adjacent Ramp		ft

-----Conversion to pc/h Under Base Conditions-----

Junction Components	Freeway	Ramp	Adjacent Ramp
Volume, V (vph)	1000	55	vph
Peak-hour factor, PHF	0.91	0.82	
Peak 15-min volume, v15	275	17	v
Trucks and buses	4	4	%
Recreational vehicles	0	0	%
Terrain type:	Level	Level	
Grade	%	%	%
Length	mi	mi	mi
Trucks and buses PCE, ET	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	

Heavy vehicle adjustment, fHV	0.980	0.980	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	1121	68	pcph

----- Estimation of V12 Merge Areas -----

L = (Equation 25-2 or 25-3)  
EQ  
P = 1.000 Using Equation 0  
FM  
 $v_{12} = v_F (P_{FM}) = 1121 \text{ pc/h}$

----- Capacity Checks -----

	Actual	Maximum	LOS F?
v <sub>FO</sub>	1189	4600	No
v <sub>3 or av34</sub>	0 pc/h	(Equation 25-4 or 25-5)	
Is v <sub>3 or av34</sub> > 2700 pc/h?		No	
Is v <sub>3 or av34</sub> > 1.5 v <sub>12</sub> / 2		No	
If yes, v <sub>12A</sub> = 1121		(Equation 25-8)	

----- Flow Entering Merge Influence Area -----

	Actual	Max Desirable	Violation?
v <sub>R12</sub>	1121	4600	No

----- Level of Service Determination (if not F) -----

Density,  $D = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A = 12.1 \text{ pc/mi/ln}$   
Level of service for ramp-freeway junction areas of influence B

----- Speed Estimation -----

Intermediate speed variable,	M = 0.305	
Space mean speed in ramp influence area,	S = 54.5	mph
Space mean speed in outer lanes,	S = N/A	mph
Space mean speed for all vehicles,	S = 54.5	mph

Phone: Fax:  
E-mail:

-----Diverge Analysis-----

Analyst: Josh Anderson  
 Agency/Co.: David Evans & Associates, Inc.  
 Date performed: 10/13/2011  
 Analysis time period: AM Peak  
 Freeway/Dir of Travel: US 26 Eastbound  
 Junction: Brookwood Interchange  
 Jurisdiction: ODOT  
 Analysis Year: 2011  
 Description: Eastbound Off-ramp to Brookwood

-----Freeway Data-----

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	60.0	mph
Volume on freeway	1875	vph

-----Off Ramp Data-----

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	180	vph
Length of first accel/decel lane	1500	ft
Length of second accel/decel lane		ft

-----Adjacent Ramp Data (if one exists)-----

Does adjacent ramp exist?	No	
Volume on adjacent ramp		vph
Position of adjacent ramp		
Type of adjacent ramp		
Distance to adjacent ramp		ft

-----Conversion to pc/h Under Base Conditions-----

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1875	180		vph
Peak-hour factor, PHF	0.88	0.86		
Peak 15-min volume, v15	533	52		v
Trucks and buses	4	4		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.980	0.980	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	2173	213	pcph

----- Estimation of V12 Diverge Areas -----

L = (Equation 25-8 or 25-9)  
EQ  
P = 1.000 Using Equation 0  
FD  
 $v_{12} = v_R + (v_F - v_R) P_{FD} = 2173 \text{ pc/h}$

----- Capacity Checks -----

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	2173	4600	No
$v_{FO} = v_F - v_R$	1960	4600	No
$v_R$	213	2000	No
$v_{3 \text{ or } av34}$	0 pc/h	(Equation 25-15 or 25-16)	
Is $v_{3 \text{ or } av34} > 2700 \text{ pc/h?}$		No	
Is $v_{3 \text{ or } av34} > 1.5 v_{12} / 2$		No	
If yes, $v_{12A} = 2173$		(Equation 25-18)	

----- Flow Entering Diverge Influence Area -----

	Actual	Max Desirable	Violation?
$v_{12}$	2173	4400	No

----- Level of Service Determination (if not F) -----

Density,  $D = 4.252 + 0.0086 v_{12} - 0.009 L_D = 9.4 \text{ pc/mi/ln}$   
Level of service for ramp-freeway junction areas of influence A

----- Speed Estimation -----

Intermediate speed variable,	D = 0.447	
Space mean speed in ramp influence area,	S = 52.0	mph
Space mean speed in outer lanes,	S = N/A	mph
Space mean speed for all vehicles,	S = 52.0	mph

Phone: Fax:  
E-mail:

-----Merge Analysis-----

Analyst: Josh Anderson  
 Agency/Co.: David Evans & Associates, Inc.  
 Date performed: 10/14/2011  
 Analysis time period: AM Peak Period  
 Freeway/Dir of Travel: US 26 Eastbound  
 Junction: Brookwood Interchange  
 Jurisdiction: ODOT  
 Analysis Year: 2011  
 Description: Eastbound On-ramp from Brookwood

-----Freeway Data-----

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	60.0	mph
Volume on freeway	1695	vph

-----On Ramp Data-----

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	475	vph
Length of first accel/decel lane	410	ft
Length of second accel/decel lane		ft

-----Adjacent Ramp Data (if one exists)-----

Does adjacent ramp exist?	No	
Volume on adjacent Ramp		vph
Position of adjacent Ramp		
Type of adjacent Ramp		
Distance to adjacent Ramp		ft

-----Conversion to pc/h Under Base Conditions-----

Junction Components	Freeway	Ramp	Adjacent Ramp
Volume, V (vph)	1695	475	vph
Peak-hour factor, PHF	0.88	0.86	
Peak 15-min volume, v15	482	138	v
Trucks and buses	4	4	%
Recreational vehicles	0	0	%
Terrain type:	Level	Level	
Grade	%	%	%
Length	mi	mi	mi
Trucks and buses PCE, ET	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	

Heavy vehicle adjustment, fHV	0.980	0.980	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	1965	563	pcph

----- Estimation of V12 Merge Areas -----

L = (Equation 25-2 or 25-3)  
EQ  
P = 1.000 Using Equation 0  
FM  
 $v_{12} = v_F (P_{FM}) = 1965 \text{ pc/h}$

----- Capacity Checks -----

	Actual	Maximum	LOS F?
v	2528	4600	No
FO			
v	0 pc/h	(Equation 25-4 or 25-5)	
3 or av34			
Is v	> 2700 pc/h?	No	
3 or av34			
Is v	> 1.5 v / 2	No	
3 or av34	12		
If yes, v	= 1965	(Equation 25-8)	
12A			

----- Flow Entering Merge Influence Area -----

	Actual	Max Desirable	Violation?
v	1965	4600	No
R12			

----- Level of Service Determination (if not F) -----

Density,  $D = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A = 22.4 \text{ pc/mi/ln}$   
Level of service for ramp-freeway junction areas of influence C

----- Speed Estimation -----

Intermediate speed variable,	M = 0.341	
	S	
Space mean speed in ramp influence area,	S = 53.9	mph
	R	
Space mean speed in outer lanes,	S = N/A	mph
	0	
Space mean speed for all vehicles,	S = 53.9	mph

Phone: Fax:  
 E-mail:

-----Diverge Analysis-----

Analyst: Josh Anderson  
 Agency/Co.: David Evans & Associates, Inc.  
 Date performed: 10/13/2011  
 Analysis time period: AM Peak  
 Freeway/Dir of Travel: US 26 Westbound  
 Junction: Brookwood Interchange  
 Jurisdiction: ODOT  
 Analysis Year: 2011  
 Description: Westbound Off-ramp to Brookwood

-----Freeway Data-----

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	60.0	mph
Volume on freeway	2300	vph

-----Off Ramp Data-----

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	1300	vph
Length of first accel/decel lane	1500	ft
Length of second accel/decel lane		ft

-----Adjacent Ramp Data (if one exists)-----

Does adjacent ramp exist?	No	
Volume on adjacent ramp		vph
Position of adjacent ramp		
Type of adjacent ramp		
Distance to adjacent ramp		ft

-----Conversion to pc/h Under Base Conditions-----

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2300	1300		vph
Peak-hour factor, PHF	0.91	0.82		
Peak 15-min volume, v15	632	396		v
Trucks and buses	4	4		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.980	0.980	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	2578	1617	pcph

----- Estimation of V12 Diverge Areas -----

L = (Equation 25-8 or 25-9)  
EQ  
P = 1.000 Using Equation 0  
FD  
 $v_{12} = v_R + (v_F - v_R) P_{FD} = 2578 \text{ pc/h}$

----- Capacity Checks -----

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	2578	4600	No
$v_{FO} = v_F - v_R$	961	4600	No
$v_R$	1617	2000	No
$v_{3 \text{ or } av34}$	0 pc/h	(Equation 25-15 or 25-16)	
Is $v_{3 \text{ or } av34} > 2700 \text{ pc/h?}$		No	
Is $v_{3 \text{ or } av34} > 1.5 v_{12} / 2$		No	
If yes, $v_{12A} = 2578$		(Equation 25-18)	

----- Flow Entering Diverge Influence Area -----

	Actual	Max Desirable	Violation?
$v_{12}$	2578	4400	No

----- Level of Service Determination (if not F) -----

Density,  $D = 4.252 + 0.0086 v_{12} - 0.009 L_D = 12.9 \text{ pc/mi/ln}$   
Level of service for ramp-freeway junction areas of influence B

----- Speed Estimation -----

Intermediate speed variable,	D = 0.574	
Space mean speed in ramp influence area,	S = 49.7	mph
Space mean speed in outer lanes,	S = N/A	mph
Space mean speed for all vehicles,	S = 49.7	mph

Phone: Fax:  
E-mail:

-----Merge Analysis-----

Analyst: Josh Anderson  
 Agency/Co.: David Evans & Associates, Inc.  
 Date performed: 12/21/2011  
 Analysis time period: AM Peak Period  
 Freeway/Dir of Travel: US 26 Westbound  
 Junction: Jackson School Rd Interchange  
 Jurisdiction: ODOT  
 Analysis Year: 2011  
 Description: Westbound On-ramp from Jackson School Rd

-----Freeway Data-----

Type of analysis	Merge		
Number of lanes in freeway	2		
Free-flow speed on freeway	60.0	mph	
Volume on freeway	660	vph	

-----On Ramp Data-----

Side of freeway	Right		
Number of lanes in ramp	1		
Free-flow speed on ramp	35.0	mph	
Volume on ramp	35	vph	
Length of first accel/decel lane	500	ft	
Length of second accel/decel lane		ft	

-----Adjacent Ramp Data (if one exists)-----

Does adjacent ramp exist?	No		
Volume on adjacent Ramp		vph	
Position of adjacent Ramp			
Type of adjacent Ramp			
Distance to adjacent Ramp		ft	

-----Conversion to pc/h Under Base Conditions-----

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	660	35		vph
Peak-hour factor, PHF	0.91	0.82		
Peak 15-min volume, v15	181	11		v
Trucks and buses	4	4		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade		%	%	%
Length		mi	mi	mi
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.980	0.980	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	740	44	pcph

----- Estimation of V12 Merge Areas -----

L = (Equation 25-2 or 25-3)

EQ

P = 1.000 Using Equation 0

FM

v = v (P ) = 740 pc/h

12 F FM

----- Capacity Checks -----

	Actual	Maximum	LOS F?
v	784	4600	No
FO			
v	0 pc/h	(Equation 25-4 or 25-5)	
3 or av34			
Is v v > 2700 pc/h?		No	
3 or av34			
Is v v > 1.5 v /2		No	
3 or av34	12		
If yes, v =		(Equation 25-8)	
12A			

----- Flow Entering Merge Influence Area -----

	Actual	Max Desirable	Violation?
v	740	4400	No
12			!

----- Level of Service Determination (if not F) -----

Density, D = 5.475 + 0.00734 v<sub>R</sub> + 0.0078 v<sub>12</sub> - 0.00627 L<sub>A</sub> = 8.4 pc/mi/ln

Level of service for ramp-freeway junction areas of influence A

----- Speed Estimation -----

Intermediate speed variable,	M = 0.295	
Space mean speed in ramp influence area,	S = 54.7	mph
Space mean speed in outer lanes,	S = N/A	mph
Space mean speed for all vehicles,	S = 54.7	mph

Phone: Fax:  
E-mail:

-----Diverge Analysis-----

Analyst: Josh Anderson  
 Agency/Co.: David Evans & Associates, Inc.  
 Date performed: 12/21/2011  
 Analysis time period: AM Peak  
 Freeway/Dir of Travel: US 26 Eastbound  
 Junction: Jackson School Interchange  
 Jurisdiction: ODOT  
 Analysis Year: 2011  
 Description: Eastbound Off-ramp to Jackson School Rd

-----Freeway Data-----

Type of analysis	Diverge		
Number of lanes in freeway	2		
Free-flow speed on freeway	60.0	mph	
Volume on freeway	1370	vph	

-----Off Ramp Data-----

Side of freeway	Right		
Number of lanes in ramp	1		
Free-Flow speed on ramp	35.0	mph	
Volume on ramp	80	vph	
Length of first accel/decel lane	1500	ft	
Length of second accel/decel lane		ft	

-----Adjacent Ramp Data (if one exists)-----

Does adjacent ramp exist?	No		
Volume on adjacent ramp		vph	
Position of adjacent ramp			
Type of adjacent ramp			
Distance to adjacent ramp		ft	

-----Conversion to pc/h Under Base Conditions-----

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1370	80		vph
Peak-hour factor, PHF	0.88	0.86		
Peak 15-min volume, v15	389	23		v
Trucks and buses	4	4		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	0.00 %	0.00 %		%
Length	0.00 mi	0.00 mi		mi
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.980	0.980	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	1588	95	pcph

----- Estimation of V12 Diverge Areas -----

L = (Equation 25-8 or 25-9)

EQ

P = 1.000 Using Equation 0

FD

$v_{12} = v_R + (v_F - v_R) P = 1588$  pc/h

12 R F R FD

----- Capacity Checks -----

	Actual	Maximum	LOS F?
$v_{12} = v_{12}$	1588	4600	No
$v_{FO} = v_{FO} - v_{R3}$	1493	4600	No
$v_{R3}$	95	2000	No
$v_{3} = v_{3}$	0 pc/h	(Equation 25-15 or 25-16)	
Is $v_{3} > 2700$ pc/h?		No	
Is $v_{3} > 1.5 v_{12} / 2$		No	
If yes, $v_{12A} =$		(Equation 25-18)	

----- Flow Entering Diverge Influence Area -----

	Actual	Max Desirable	Violation?
$v_{12}$	1588	4600	No

----- Level of Service Determination (if not F) -----

Density,  $D = 4.252 + 0.0086 v_{12} - 0.009 L_D = 4.4$  pc/mi/ln

Level of service for ramp-freeway junction areas of influence A

----- Speed Estimation -----

Intermediate speed variable,	D = 0.437	
Space mean speed in ramp influence area,	S <sub>R</sub> = 52.1	mph
Space mean speed in outer lanes,	S <sub>0</sub> = N/A	mph
Space mean speed for all vehicles,	S = 52.1	mph

Phone: Fax:  
E-mail:

-----Merge Analysis-----

Analyst: Josh Anderson  
 Agency/Co.: David Evans & Associates, Inc.  
 Date performed: 10/14/2011  
 Analysis time period: AM Peak Period  
 Freeway/Dir of Travel: US 26 Eastbound  
 Junction: Jackson School Rd Interchange  
 Jurisdiction: ODOT  
 Analysis Year: 2011  
 Description: Eastbound On-ramp from Jackson School Rd

-----Freeway Data-----

Type of analysis	Merge		
Number of lanes in freeway	2		
Free-flow speed on freeway	60.0	mph	
Volume on freeway	1290	vph	

-----On Ramp Data-----

Side of freeway	Right		
Number of lanes in ramp	1		
Free-flow speed on ramp	35.0	mph	
Volume on ramp	585	vph	
Length of first accel/decel lane	500	ft	
Length of second accel/decel lane		ft	

-----Adjacent Ramp Data (if one exists)-----

Does adjacent ramp exist?	No		
Volume on adjacent Ramp		vph	
Position of adjacent Ramp			
Type of adjacent Ramp			
Distance to adjacent Ramp		ft	

-----Conversion to pc/h Under Base Conditions-----

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1290	585		vph
Peak-hour factor, PHF	0.88	0.86		
Peak 15-min volume, v15	366	170		v
Trucks and buses	4	4		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade		%	%	%
Length		mi	mi	mi
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.980	0.980	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	1495	694	pcph

----- Estimation of V12 Merge Areas -----

L = (Equation 25-2 or 25-3)

EQ

P = 1.000 Using Equation 0

FM

v = v (P ) = 1495 pc/h

12 F FM

----- Capacity Checks -----

	Actual	Maximum	LOS F?
v	2189	4600	No
FO			
v	0 pc/h	(Equation 25-4 or 25-5)	
3 or av34			
Is v v > 2700 pc/h?		No	
3 or av34			
Is v v > 1.5 v /2		No	
3 or av34	12		
If yes, v =		(Equation 25-8)	
12A			

----- Flow Entering Merge Influence Area -----

	Actual	Max Desirable	Violation?
v	1495	4400	No
12			

----- Level of Service Determination (if not F) -----

Density, D = 5.475 + 0.00734 v<sub>R</sub> + 0.0078 v<sub>12</sub> - 0.00627 L<sub>A</sub> = 19.1 pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

----- Speed Estimation -----

Intermediate speed variable,	M = 0.321	
Space mean speed in ramp influence area,	S = 54.2	mph
Space mean speed in outer lanes,	S = N/A	mph
Space mean speed for all vehicles,	S = 54.2	mph

Phone: Fax:  
E-mail:

-----Diverge Analysis-----

Analyst: Josh Anderson  
 Agency/Co.: David Evans & Associates, Inc.  
 Date performed: 12/21/2011  
 Analysis time period: AM Peak  
 Freeway/Dir of Travel: US 26 Westbound  
 Junction: Jackson School Rd Interchange  
 Jurisdiction: ODOT  
 Analysis Year: 2011  
 Description: Westbound Off-ramp to Jackson School Rd

-----Freeway Data-----

Type of analysis	Diverge		
Number of lanes in freeway	2		
Free-flow speed on freeway	60.0	mph	
Volume on freeway	1055	vph	

-----Off Ramp Data-----

Side of freeway	Right		
Number of lanes in ramp	1		
Free-Flow speed on ramp	35.0	mph	
Volume on ramp	395	vph	
Length of first accel/decel lane	1500	ft	
Length of second accel/decel lane		ft	

-----Adjacent Ramp Data (if one exists)-----

Does adjacent ramp exist?	No		
Volume on adjacent ramp		vph	
Position of adjacent ramp			
Type of adjacent ramp			
Distance to adjacent ramp		ft	

-----Conversion to pc/h Under Base Conditions-----

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1055	395		vph
Peak-hour factor, PHF	0.91	0.82		
Peak 15-min volume, v15	290	120		v
Trucks and buses	4	4		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.980	0.980	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	1183	491	pcph

----- Estimation of V12 Diverge Areas -----

L = (Equation 25-8 or 25-9)

EQ

P = 1.000 Using Equation 0

FD

$v_{12} = v_R + (v_F - v_R) P = 1183$  pc/h

12 R F R FD

----- Capacity Checks -----

	Actual	Maximum	LOS F?
$v_{12} = v_{12}$	1183	4600	No
$v_{FO} = v_{FO} - v_{R3}$	692	4600	No
$v_{R3}$	491	2000	No
$v_{3} = v_{3}$	0 pc/h	(Equation 25-15 or 25-16)	
Is $v_{3} > 2700$ pc/h?		No	
Is $v_{3} > 1.5 v_{12} / 2$		No	
If yes, $v_{12A} =$		(Equation 25-18)	

----- Flow Entering Diverge Influence Area -----

	Actual	Max Desirable	Violation?
$v_{12}$	1183	4600	No

----- Level of Service Determination (if not F) -----

Density,  $D = 4.252 + 0.0086 v_{12} - 0.009 L = 0.9$  pc/mi/ln

Level of service for ramp-freeway junction areas of influence A

----- Speed Estimation -----

Intermediate speed variable,	D = 0.472	
Space mean speed in ramp influence area,	S = 51.5	mph
Space mean speed in outer lanes,	S = N/A	mph
Space mean speed for all vehicles,	S = 51.5	mph

# PM Operations

Phone: Fax:  
E-mail:

-----Merge Analysis-----

Analyst: Josh Anderson  
Agency/Co.: David Evans & Associates, Inc.  
Date performed: 12/21/2011  
Analysis time period: PM Peak Period  
Freeway/Dir of Travel: US 26 Westbound  
Junction: Cornelius Pass Rd Interchange  
Jurisdiction: ODOT  
Analysis Year: 2011  
Description: Westbound On-ramp from Cornelius Pass Rd

-----Freeway Data-----

Type of analysis	Merge		
Number of lanes in freeway	2		
Free-flow speed on freeway	60.0	mph	
Volume on freeway	2075	vph	

-----On Ramp Data-----

Side of freeway	Right		
Number of lanes in ramp	1		
Free-flow speed on ramp	35.0	mph	
Volume on ramp	450	vph	
Length of first accel/decel lane	500	ft	
Length of second accel/decel lane		ft	

-----Adjacent Ramp Data (if one exists)-----

Does adjacent ramp exist?	No		
Volume on adjacent Ramp	0	vph	
Position of adjacent Ramp			
Type of adjacent Ramp			
Distance to adjacent Ramp	1000	ft	

-----Conversion to pc/h Under Base Conditions-----

Junction Components	Freeway		Ramp		Adjacent Ramp	
Volume, V (vph)	2075		450		0	vph
Peak-hour factor, PHF	0.93		0.93		0.90	
Peak 15-min volume, v15	558		121		0	v
Trucks and buses	1		3		0	%
Recreational vehicles	0		0		0	%
Terrain type:	Level		Level			
Grade	0.00	%	0.00	%	0.00	%
Length	0.00	mi	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5		1.5		1.5	
Recreational vehicle PCE, ER	1.2		1.2		1.2	

Heavy vehicle adjustment, fHV	0.995	0.985	1.000	
Driver population factor, fP	1.00	1.00	1.00	
Flow rate, vp	2242	491	0	pcph

----- Estimation of V12 Merge Areas -----

L = (Equation 25-2 or 25-3)

EQ

P = 1.000 Using Equation 0

FM

v = v (P ) = 2242 pc/h

12 F FM

----- Capacity Checks -----

		Actual	Maximum	LOS F?
v		2733	4600	No
FO				
v	v	0 pc/h	(Equation 25-4 or 25-5)	
3 or av34				
Is v	v	> 2700 pc/h?	No	
3 or av34				
Is v	v	> 1.5 v /2	No	
3 or av34		12		
If yes, v	=		(Equation 25-8)	
12A				

----- Flow Entering Merge Influence Area -----

	Actual	Max Desirable	Violation?
v	2242	4400	No
12			

----- Level of Service Determination (if not F) -----

Density, D = 5.475 + 0.00734 v<sub>R</sub> + 0.0078 v<sub>12</sub> - 0.00627 L<sub>A</sub> = 23.4 pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

----- Speed Estimation -----

Intermediate speed variable,	M = 0.346	
	S	
Space mean speed in ramp influence area,	S = 53.8	mph
	R	
Space mean speed in outer lanes,	S = N/A	mph
	0	
Space mean speed for all vehicles,	S = 53.8	mph

Phone: Fax:  
E-mail:

-----Diverge Analysis-----

Analyst: Josh Anderson  
 Agency/Co.: David Evans & Associates, Inc.  
 Date performed: 12/21/2011  
 Analysis time period: PM Peak  
 Freeway/Dir of Travel: US 26 Eastbound  
 Junction: Cornelius Pass Rd Interchange  
 Jurisdiction: ODOT  
 Analysis Year: 2011  
 Description: Eastbound Off-ramp to Cornelius Pass Rd

-----Freeway Data-----

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	60.0	mph
Volume on freeway	2305	vph

-----Off Ramp Data-----

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	290	vph
Length of first accel/decel lane	1500	ft
Length of second accel/decel lane		ft

-----Adjacent Ramp Data (if one exists)-----

Does adjacent ramp exist?	No	
Volume on adjacent ramp		vph
Position of adjacent ramp		
Type of adjacent ramp		
Distance to adjacent ramp		ft

-----Conversion to pc/h Under Base Conditions-----

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2305	290		vph
Peak-hour factor, PHF	0.92	0.96		
Peak 15-min volume, v15	626	76		v
Trucks and buses	1	1		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.995	0.995	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	2518	304	pcph

----- Estimation of V12 Diverge Areas -----

L = (Equation 25-8 or 25-9)

EQ

P = 1.000 Using Equation 0

FD

$v_{12} = v_R + (v_F - v_R) P = 2518$  pc/h

12 R F R FD

----- Capacity Checks -----

	Actual	Maximum	LOS F?
$v = v_{12}$	2518	4600	No
$v_{Fi} = v_F - v_{FO}$	2214	4600	No
$v_R$	304	2000	No
$v_3$ or $v_{av34}$	0 pc/h	(Equation 25-15 or 25-16)	
Is $v_3$ or $v_{av34} > 2700$ pc/h?		No	
Is $v_3$ or $v_{av34} > 1.5 v_{12} / 2$		No	
If yes, $v_{12A} =$		(Equation 25-18)	

----- Flow Entering Diverge Influence Area -----

	Actual	Max Desirable	Violation?
$v_{12}$	2518	4600	No

----- Level of Service Determination (if not F) -----

Density,  $D = 4.252 + 0.0086 v_{12} - 0.009 L_D = 12.4$  pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

----- Speed Estimation -----

Intermediate speed variable,	D = 0.455	
Space mean speed in ramp influence area,	S <sub>R</sub> = 51.8	mph
Space mean speed in outer lanes,	S <sub>0</sub> = N/A	mph
Space mean speed for all vehicles,	S = 51.8	mph

Phone: Fax:  
E-mail:

-----Merge Analysis-----

Analyst: Josh Anderson  
 Agency/Co.: David Evans & Associates, Inc.  
 Date performed: 12/21/2011  
 Analysis time period: PM Peak Period  
 Freeway/Dir of Travel: US 26 Eastbound  
 Junction: Cornelius Pass Rd Interchange  
 Jurisdiction: ODOT  
 Analysis Year: 2011  
 Description: Northbound to Eastbound On-Ramp from Cornelius Pass Rd

-----Freeway Data-----

Type of analysis	Merge		
Number of lanes in freeway	2		
Free-flow speed on freeway	60.0	mph	
Volume on freeway	2315	vph	

-----On Ramp Data-----

Side of freeway	Right		
Number of lanes in ramp	1		
Free-flow speed on ramp	35.0	mph	
Volume on ramp	920	vph	
Length of first accel/decel lane	500	ft	
Length of second accel/decel lane		ft	

-----Adjacent Ramp Data (if one exists)-----

Does adjacent ramp exist?	No		
Volume on adjacent Ramp		vph	
Position of adjacent Ramp			
Type of adjacent Ramp			
Distance to adjacent Ramp		ft	

-----Conversion to pc/h Under Base Conditions-----

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2315	920		vph
Peak-hour factor, PHF	0.92	0.96		
Peak 15-min volume, v15	629	240		v
Trucks and buses	1	1		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade		%	%	%
Length		mi	mi	mi
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.995	0.995	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	2529	963	pcph

----- Estimation of V12 Merge Areas -----

L = (Equation 25-2 or 25-3)

EQ

P = 1.000 Using Equation 0

FM

v = v (P ) = 2529 pc/h

12 F FM

----- Capacity Checks -----

	Actual	Maximum	LOS F?
v	3492	4600	No
FO			
v	0 pc/h	(Equation 25-4 or 25-5)	
3 or av34			
Is v	> 2700 pc/h?	No	
3 or av34			
Is v	> 1.5 v /2	No	
3 or av34	12		
If yes, v	=	(Equation 25-8)	
12A			

----- Flow Entering Merge Influence Area -----

	Actual	Max Desirable	Violation?
v	2529	4400	No
12			

----- Level of Service Determination (if not F) -----

Density, D = 5.475 + 0.00734 v<sub>R</sub> + 0.0078 v<sub>12</sub> - 0.00627 L<sub>A</sub> = 29.1 pc/mi/ln

Level of service for ramp-freeway junction areas of influence D

----- Speed Estimation -----

Intermediate speed variable,	M = 0.414	
Space mean speed in ramp influence area,	S = 52.5	mph
Space mean speed in outer lanes,	S = N/A	mph
Space mean speed for all vehicles,	S = 52.5	mph

Phone: Fax:  
E-mail:

-----Merge Analysis-----

Analyst: Josh Anderson  
 Agency/Co.: David Evans & Associates, Inc.  
 Date performed: 12/21/2011  
 Analysis time period: PM Peak Period  
 Freeway/Dir of Travel: US 26 Eastbound  
 Junction: Cornelius Pass Rd Interchange  
 Jurisdiction: ODOT  
 Analysis Year: 2011  
 Description: Southbound to Eastbound On-Ramp from Cornelius Pass Rd

-----Freeway Data-----

Type of analysis	Merge		
Number of lanes in freeway	2		
Free-flow speed on freeway	60.0	mph	
Volume on freeway	2015	vph	

-----On Ramp Data-----

Side of freeway	Right		
Number of lanes in ramp	1		
Free-flow speed on ramp	35.0	mph	
Volume on ramp	300	vph	
Length of first accel/decel lane	500	ft	
Length of second accel/decel lane		ft	

-----Adjacent Ramp Data (if one exists)-----

Does adjacent ramp exist?	No		
Volume on adjacent Ramp		vph	
Position of adjacent Ramp			
Type of adjacent Ramp			
Distance to adjacent Ramp		ft	

-----Conversion to pc/h Under Base Conditions-----

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2015	300		vph
Peak-hour factor, PHF	0.92	0.96		
Peak 15-min volume, v15	548	78		v
Trucks and buses	1	1		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade		%	%	%
Length		mi	mi	mi
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.995	0.995	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	2201	314	pcph

----- Estimation of V12 Merge Areas -----

L = (Equation 25-2 or 25-3)

EQ

P = 1.000 Using Equation 0

FM

v = v (P ) = 2201 pc/h

12 F FM

----- Capacity Checks -----

		Actual	Maximum	LOS F?
v		2515	4600	No
FO				
v	v	0 pc/h	(Equation 25-4 or 25-5)	
3 or av34				
Is v	v	> 2700 pc/h?	No	
3 or av34				
Is v	v	> 1.5 v /2	No	
3 or av34		12		
If yes, v	=		(Equation 25-8)	
12A				

----- Flow Entering Merge Influence Area -----

	Actual	Max Desirable	Violation?
v	2201	4400	No
12			

----- Level of Service Determination (if not F) -----

Density, D = 5.475 + 0.00734 v<sub>R</sub> + 0.0078 v<sub>12</sub> - 0.00627 L<sub>A</sub> = 21.8 pc/mi/ln

Level of service for ramp-freeway junction areas of influence C

----- Speed Estimation -----

Intermediate speed variable,	M = 0.334	
	S	
Space mean speed in ramp influence area,	S = 54.0	mph
	R	
Space mean speed in outer lanes,	S = N/A	mph
	0	
Space mean speed for all vehicles,	S = 54.0	mph

Phone: Fax:  
E-mail:

-----Diverge Analysis-----

Analyst: Josh Anderson  
Agency/Co.: David Evans & Associates, Inc.  
Date performed: 12/21/2011  
Analysis time period: PM Peak  
Freeway/Dir of Travel: US 26 Westbound  
Junction: Cornelius Pass Rd Interchange  
Jurisdiction: ODOT  
Analysis Year: 2011  
Description: Westbound LOOP Off-ramp to Cornelius Pass Rd

-----Freeway Data-----

Type of analysis	Diverge		
Number of lanes in freeway	2		
Free-flow speed on freeway	60.0	mph	
Volume on freeway	2775	vph	

-----Off Ramp Data-----

Side of freeway	Right		
Number of lanes in ramp	1		
Free-Flow speed on ramp	35.0	mph	
Volume on ramp	700	vph	
Length of first accel/decel lane	1500	ft	
Length of second accel/decel lane		ft	

-----Adjacent Ramp Data (if one exists)-----

Does adjacent ramp exist?	No		
Volume on adjacent ramp		vph	
Position of adjacent ramp			
Type of adjacent ramp			
Distance to adjacent ramp		ft	

-----Conversion to pc/h Under Base Conditions-----

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2775	700		vph
Peak-hour factor, PHF	0.93	0.93		
Peak 15-min volume, v15	746	188		v
Trucks and buses	1	3		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	0.00 %	0.00 %		%
Length	0.00 mi	0.00 mi		mi
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.995	0.985	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	2999	764	pcph

----- Estimation of V12 Diverge Areas -----

L = (Equation 25-8 or 25-9)

EQ

P = 1.000 Using Equation 0

FD

$v_{12} = v_R + (v_F - v_R) P = 2999$  pc/h

12 R F R FD

----- Capacity Checks -----

	Actual	Maximum	LOS F?
$v = v_{12}$	2999	4600	No
$v_{Fi} = v_F - v_R$	2235	4600	No
$v_R$	764	2000	No
$v_3$ or $v_{av34}$	0 pc/h	(Equation 25-15 or 25-16)	
Is $v_3$ or $v_{av34} > 2700$ pc/h?		No	
Is $v_3$ or $v_{av34} > 1.5 v_{12} / 2$		No	
If yes, $v_{12A} =$		(Equation 25-18)	

----- Flow Entering Diverge Influence Area -----

	Actual	Max Desirable	Violation?
$v_{12}$	2999	4600	No

----- Level of Service Determination (if not F) -----

Density,  $D = 4.252 + 0.0086 v_R - 0.009 L_D = 16.5$  pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

----- Speed Estimation -----

Intermediate speed variable,	D = 0.497	
Space mean speed in ramp influence area,	S <sub>R</sub> = 51.1	mph
Space mean speed in outer lanes,	S <sub>0</sub> = N/A	mph
Space mean speed for all vehicles,	S = 51.1	mph

Phone: Fax:  
E-mail:

-----Diverge Analysis-----

Analyst: Josh Anderson  
 Agency/Co.: David Evans & Associates, Inc.  
 Date performed: 12/21/2011  
 Analysis time period: PM Peak  
 Freeway/Dir of Travel: US 26 Westbound  
 Junction: Cornelius Pass Rd Interchange  
 Jurisdiction: ODOT  
 Analysis Year: 2011  
 Description: Westbound Off-ramp to Cornelius Pass Rd

-----Freeway Data-----

Type of analysis	Diverge		
Number of lanes in freeway	2		
Free-flow speed on freeway	60.0	mph	
Volume on freeway	3075	vph	

-----Off Ramp Data-----

Side of freeway	Right		
Number of lanes in ramp	1		
Free-Flow speed on ramp	35.0	mph	
Volume on ramp	300	vph	
Length of first accel/decel lane	1500	ft	
Length of second accel/decel lane		ft	

-----Adjacent Ramp Data (if one exists)-----

Does adjacent ramp exist?	No		
Volume on adjacent ramp		vph	
Position of adjacent ramp			
Type of adjacent ramp			
Distance to adjacent ramp		ft	

-----Conversion to pc/h Under Base Conditions-----

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	3075	300		vph
Peak-hour factor, PHF	0.93	0.93		
Peak 15-min volume, v15	827	81		v
Trucks and buses	1	3		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.995	0.985	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	3323	327	pcph

----- Estimation of V12 Diverge Areas -----

L = (Equation 25-8 or 25-9)

EQ

P = 1.000 Using Equation 0

FD

$v_{12} = v_R + (v_F - v_R) P = 3323$  pc/h

12 R F R FD

----- Capacity Checks -----

	Actual	Maximum	LOS F?
$v = v_{12}$	3323	4600	No
$v_{Fi} = v_F - v_R$	2996	4600	No
$v_R$	327	2000	No
$v_{3 \text{ or } 34}$	0 pc/h	(Equation 25-15 or 25-16)	
Is $v_{3 \text{ or } 34} > 2700$ pc/h?		No	
Is $v_{3 \text{ or } 34} > 1.5 v_{12} / 2$		No	
If yes, $v_{12A} =$		(Equation 25-18)	

----- Flow Entering Diverge Influence Area -----

	Actual	Max Desirable	Violation?
$v_{12}$	3323	4600	No

----- Level of Service Determination (if not F) -----

Density,  $D = 4.252 + 0.0086 v_R - 0.009 L_D = 19.3$  pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

----- Speed Estimation -----

Intermediate speed variable,	D = 0.457	
Space mean speed in ramp influence area,	S = 51.8	mph
Space mean speed in outer lanes,	S = N/A	mph
Space mean speed for all vehicles,	S = 51.8	mph

Phone: Fax:  
E-mail:

-----Merge Analysis-----

Analyst: Josh Anderson  
 Agency/Co.: David Evans & Associates, Inc.  
 Date performed: 10/14/2011  
 Analysis time period: PM Peak Period  
 Freeway/Dir of Travel: US 26 Westbound  
 Junction: Brookwood Interchange  
 Jurisdiction: ODOT  
 Analysis Year: 2011  
 Description: Westbound On-ramp from Brookwood

-----Freeway Data-----

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	60.0	mph
Volume on freeway	1800	vph

-----On Ramp Data-----

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	280	vph
Length of first accel/decel lane	410	ft
Length of second accel/decel lane		ft

-----Adjacent Ramp Data (if one exists)-----

Does adjacent ramp exist?	No	
Volume on adjacent Ramp		vph
Position of adjacent Ramp		
Type of adjacent Ramp		
Distance to adjacent Ramp		ft

-----Conversion to pc/h Under Base Conditions-----

Junction Components	Freeway	Ramp	Adjacent Ramp
Volume, V (vph)	1800	280	vph
Peak-hour factor, PHF	0.93	0.93	
Peak 15-min volume, v15	484	75	v
Trucks and buses	1	3	%
Recreational vehicles	0	0	%
Terrain type:	Level	Level	
Grade	%	%	%
Length	mi	mi	mi
Trucks and buses PCE, ET	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	

Heavy vehicle adjustment, fHV	0.995	0.985	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	1945	306	pcph

----- Estimation of V12 Merge Areas -----

L = (Equation 25-2 or 25-3)  
EQ  
P = 1.000 Using Equation 0  
FM  
 $v_{12} = v_F (P_{FM}) = 1945 \text{ pc/h}$

----- Capacity Checks -----

	Actual	Maximum	LOS F?
v <sub>FO</sub>	2251	4600	No
v <sub>3 or av34</sub>	0 pc/h	(Equation 25-4 or 25-5)	
Is v <sub>3 or av34</sub> > 2700 pc/h?		No	
Is v <sub>3 or av34</sub> > 1.5 v <sub>12</sub> / 2		No	
If yes, v <sub>12A</sub> = 1945		(Equation 25-8)	

----- Flow Entering Merge Influence Area -----

	Actual	Max Desirable	Violation?
v <sub>R12</sub>	1945	4600	No

----- Level of Service Determination (if not F) -----

Density,  $D = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A = 20.3 \text{ pc/mi/ln}$   
Level of service for ramp-freeway junction areas of influence C

----- Speed Estimation -----

Intermediate speed variable,	M = 0.329	
Space mean speed in ramp influence area,	S = 54.1	mph
Space mean speed in outer lanes,	S = N/A	mph
Space mean speed for all vehicles,	S = 54.1	mph

Phone: Fax:  
E-mail:

-----Diverge Analysis-----

Analyst: Josh Anderson  
 Agency/Co.: David Evans & Associates, Inc.  
 Date performed: 10/13/2011  
 Analysis time period: PM Peak  
 Freeway/Dir of Travel: US 26 Eastbound  
 Junction: Brookwood Interchange  
 Jurisdiction: ODOT  
 Analysis Year: 2011  
 Description: Eastbound Off-ramp to Brookwood

-----Freeway Data-----

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	60.0	mph
Volume on freeway	1635	vph

-----Off Ramp Data-----

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	130	vph
Length of first accel/decel lane	1500	ft
Length of second accel/decel lane		ft

-----Adjacent Ramp Data (if one exists)-----

Does adjacent ramp exist?	No	
Volume on adjacent ramp		vph
Position of adjacent ramp		
Type of adjacent ramp		
Distance to adjacent ramp		ft

-----Conversion to pc/h Under Base Conditions-----

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1635	130		vph
Peak-hour factor, PHF	0.92	0.96		
Peak 15-min volume, v15	444	34		v
Trucks and buses	1	1		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	0.00	0.00	%	%
Length	0.00	0.00	mi	mi
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.995	0.995	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	1786	136	pcph

----- Estimation of V12 Diverge Areas -----

L = (Equation 25-8 or 25-9)  
EQ  
P = 1.000 Using Equation 0  
FD  
 $v_{12} = v_R + (v_F - v_R) P_{FD} = 1786 \text{ pc/h}$

----- Capacity Checks -----

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	1786	4600	No
$v_{FO} = v_F - v_R$	1650	4600	No
$v_R$	136	2000	No
$v_{3 \text{ or } av34}$	0 pc/h	(Equation 25-15 or 25-16)	
Is $v_{3 \text{ or } av34} > 2700 \text{ pc/h?}$		No	
Is $v_{3 \text{ or } av34} > 1.5 v_{12} / 2$		No	
If yes, $v_{12A} = 1786$		(Equation 25-18)	

----- Flow Entering Diverge Influence Area -----

	Actual	Max Desirable	Violation?
$v_{12}$	1786	4400	No

----- Level of Service Determination (if not F) -----

Density,  $D = 4.252 + 0.0086 v_{12} - 0.009 L_D = 6.1 \text{ pc/mi/ln}$   
Level of service for ramp-freeway junction areas of influence A

----- Speed Estimation -----

Intermediate speed variable,	D = 0.440	
Space mean speed in ramp influence area,	S = 52.1	mph
Space mean speed in outer lanes,	S = N/A	mph
Space mean speed for all vehicles,	S = 52.1	mph

Phone: Fax:  
 E-mail:

-----Merge Analysis-----

Analyst: Josh Anderson  
 Agency/Co.: David Evans & Associates, Inc.  
 Date performed: 10/14/2011  
 Analysis time period: PM Peak Period  
 Freeway/Dir of Travel: US 26 Eastbound  
 Junction: Brookwood Interchange  
 Jurisdiction: ODOT  
 Analysis Year: 2011  
 Description: Eastbound On-Ramp from Brookwood

-----Freeway Data-----

Type of analysis	Merge	
Number of lanes in freeway	2	
Free-flow speed on freeway	60.0	mph
Volume on freeway	1505	vph

-----On Ramp Data-----

Side of freeway	Right	
Number of lanes in ramp	1	
Free-flow speed on ramp	35.0	mph
Volume on ramp	800	vph
Length of first accel/decel lane	410	ft
Length of second accel/decel lane		ft

-----Adjacent Ramp Data (if one exists)-----

Does adjacent ramp exist?	No	
Volume on adjacent Ramp		vph
Position of adjacent Ramp		
Type of adjacent Ramp		
Distance to adjacent Ramp		ft

-----Conversion to pc/h Under Base Conditions-----

Junction Components	Freeway	Ramp	Adjacent Ramp
Volume, V (vph)	1505	800	vph
Peak-hour factor, PHF	0.92	0.96	
Peak 15-min volume, v15	409	208	v
Trucks and buses	1	1	%
Recreational vehicles	0	0	%
Terrain type:	Level	Level	
Grade	%	%	%
Length	mi	mi	mi
Trucks and buses PCE, ET	1.5	1.5	
Recreational vehicle PCE, ER	1.2	1.2	

Heavy vehicle adjustment, fHV	0.995	0.995	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	1644	838	pcph

----- Estimation of V12 Merge Areas -----

L = (Equation 25-2 or 25-3)  
EQ  
P = 1.000 Using Equation 0  
FM  
 $v_{12} = v_F (P_{FM}) = 1644 \text{ pc/h}$

----- Capacity Checks -----

	Actual	Maximum	LOS F?
v <sub>FO</sub>	2482	4600	No
v <sub>3 or av34</sub>	0 pc/h	(Equation 25-4 or 25-5)	
Is v <sub>3 or av34</sub> > 2700 pc/h?		No	
Is v <sub>3 or av34</sub> > 1.5 v <sub>12</sub> / 2		No	
If yes, v <sub>12A</sub> = 1644		(Equation 25-8)	

----- Flow Entering Merge Influence Area -----

	Actual	Max Desirable	Violation?
v <sub>R12</sub>	1644	4600	No

----- Level of Service Determination (if not F) -----

Density,  $D = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A = 21.9 \text{ pc/mi/ln}$   
Level of service for ramp-freeway junction areas of influence C

----- Speed Estimation -----

Intermediate speed variable,	M = 0.339	
Space mean speed in ramp influence area,	S = 53.9	mph
Space mean speed in outer lanes,	S = N/A	mph
Space mean speed for all vehicles,	S = 53.9	mph

Phone: Fax:  
E-mail:

-----Diverge Analysis-----

Analyst: Josh Anderson  
 Agency/Co.: David Evans & Associates, Inc.  
 Date performed: 10/13/2011  
 Analysis time period: PM Peak  
 Freeway/Dir of Travel: US 26 Westbound  
 Junction: Brookwood Interchange  
 Jurisdiction: ODOT  
 Analysis Year: 2011  
 Description: Westbound Off-ramp to Brookwood

-----Freeway Data-----

Type of analysis	Diverge	
Number of lanes in freeway	2	
Free-flow speed on freeway	60.0	mph
Volume on freeway	2525	vph

-----Off Ramp Data-----

Side of freeway	Right	
Number of lanes in ramp	1	
Free-Flow speed on ramp	35.0	mph
Volume on ramp	725	vph
Length of first accel/decel lane	1500	ft
Length of second accel/decel lane		ft

-----Adjacent Ramp Data (if one exists)-----

Does adjacent ramp exist?	No	
Volume on adjacent ramp		vph
Position of adjacent ramp		
Type of adjacent ramp		
Distance to adjacent ramp		ft

-----Conversion to pc/h Under Base Conditions-----

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2525	725		vph
Peak-hour factor, PHF	0.93	0.93		
Peak 15-min volume, v15	679	195		v
Trucks and buses	1	3		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.995	0.985	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	2729	791	pcph

----- Estimation of V12 Diverge Areas -----

L = (Equation 25-8 or 25-9)  
EQ  
P = 1.000 Using Equation 0  
FD  
 $v_{12} = v_R + (v_F - v_R) P_{FD} = 2729 \text{ pc/h}$

----- Capacity Checks -----

	Actual	Maximum	LOS F?
$v_{Fi} = v_F$	2729	4600	No
$v_{FO} = v_F - v_R$	1938	4600	No
$v_R$	791	2000	No
$v_{3 \text{ or } av34}$	0 pc/h	(Equation 25-15 or 25-16)	
Is $v_{3 \text{ or } av34} > 2700 \text{ pc/h?}$		No	
Is $v_{3 \text{ or } av34} > 1.5 v_{12} / 2$		No	
If yes, $v_{12A} = 2729$		(Equation 25-18)	

----- Flow Entering Diverge Influence Area -----

	Actual	Max Desirable	Violation?
$v_{12}$	2729	4400	No

----- Level of Service Determination (if not F) -----

Density,  $D = 4.252 + 0.0086 v_{12} - 0.009 L_D = 14.2 \text{ pc/mi/ln}$   
Level of service for ramp-freeway junction areas of influence B

----- Speed Estimation -----

Intermediate speed variable,	D = 0.499	
Space mean speed in ramp influence area,	S = 51.0	mph
Space mean speed in outer lanes,	S = N/A	mph
Space mean speed for all vehicles,	S = 51.0	mph

Phone: Fax:  
E-mail:

-----Merge Analysis-----

Analyst: Josh Anderson  
 Agency/Co.: David Evans & Associates, Inc.  
 Date performed: 12/21/2011  
 Analysis time period: PM Peak Period  
 Freeway/Dir of Travel: US 26 Westbound  
 Junction: Jackson School Rd Interchange  
 Jurisdiction: ODOT  
 Analysis Year: 2011  
 Description: Westbound On-ramp from Jackson School Rd

-----Freeway Data-----

Type of analysis	Merge		
Number of lanes in freeway	2		
Free-flow speed on freeway	60.0	mph	
Volume on freeway	1520	vph	

-----On Ramp Data-----

Side of freeway	Right		
Number of lanes in ramp	1		
Free-flow speed on ramp	35.0	mph	
Volume on ramp	75	vph	
Length of first accel/decel lane	500	ft	
Length of second accel/decel lane		ft	

-----Adjacent Ramp Data (if one exists)-----

Does adjacent ramp exist?	No		
Volume on adjacent Ramp		vph	
Position of adjacent Ramp			
Type of adjacent Ramp			
Distance to adjacent Ramp		ft	

-----Conversion to pc/h Under Base Conditions-----

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1520	75		vph
Peak-hour factor, PHF	0.93	0.93		
Peak 15-min volume, v15	409	20		v
Trucks and buses	1	3		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	%	%	%	%
Length	mi	mi	mi	mi
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.995	0.985	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	1643	82	pcph

----- Estimation of V12 Merge Areas -----

L = (Equation 25-2 or 25-3)

EQ

P = 1.000 Using Equation 0

FM

v = v (P ) = 1643 pc/h

12 F FM

----- Capacity Checks -----

	Actual	Maximum	LOS F?
v	1725	4600	No
FO			
v	v	0 pc/h	(Equation 25-4 or 25-5)
3 or av34			
Is v	v	> 2700 pc/h?	No
3 or av34			
Is v	v	> 1.5 v /2	No
3 or av34	12		
If yes, v	=	(Equation 25-8)	
12A			

----- Flow Entering Merge Influence Area -----

	Actual	Max Desirable	Violation?
v	1643	4400	No
12			

----- Level of Service Determination (if not F) -----

Density, D = 5.475 + 0.00734 v<sub>R</sub> + 0.0078 v<sub>12</sub> - 0.00627 L<sub>A</sub> = 15.8 pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

----- Speed Estimation -----

Intermediate speed variable,	M = 0.308	
Space mean speed in ramp influence area,	S = 54.5	mph
Space mean speed in outer lanes,	S = N/A	mph
Space mean speed for all vehicles,	S = 54.5	mph

Phone: Fax:  
E-mail:

-----Diverge Analysis-----

Analyst: Josh Anderson  
 Agency/Co.: David Evans & Associates, Inc.  
 Date performed: 12/21/2011  
 Analysis time period: PM Peak  
 Freeway/Dir of Travel: US 26 Eastbound  
 Junction: Jackson School Rd Interchange  
 Jurisdiction: ODOT  
 Analysis Year: 2011  
 Description: Eastbound Off-ramp to Jackson School Rd

-----Freeway Data-----

Type of analysis	Diverge		
Number of lanes in freeway	2		
Free-flow speed on freeway	60.0	mph	
Volume on freeway	1055	vph	

-----Off Ramp Data-----

Side of freeway	Right		
Number of lanes in ramp	1		
Free-Flow speed on ramp	35.0	mph	
Volume on ramp	30	vph	
Length of first accel/decel lane	1500	ft	
Length of second accel/decel lane		ft	

-----Adjacent Ramp Data (if one exists)-----

Does adjacent ramp exist?	No		
Volume on adjacent ramp		vph	
Position of adjacent ramp			
Type of adjacent ramp			
Distance to adjacent ramp		ft	

-----Conversion to pc/h Under Base Conditions-----

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1055	30		vph
Peak-hour factor, PHF	0.92	0.96		
Peak 15-min volume, v15	287	8		v
Trucks and buses	1	1		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.995	0.995	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	1152	31	pcph

----- Estimation of V12 Diverge Areas -----

L = (Equation 25-8 or 25-9)

EQ

P = 1.000 Using Equation 0

FD

$v_{12} = v_R + (v_F - v_R) P = 1152$  pc/h

12 R F R FD

----- Capacity Checks -----

	Actual	Maximum	LOS F?
$v = v_{12}$	1152	4600	No
$v_{Fi} = v_F - v_R$	1121	4600	No
$v_R$	31	2000	No
$v_3$ or $v_{av34}$	0 pc/h	(Equation 25-15 or 25-16)	
Is $v_3$ or $v_{av34} > 2700$ pc/h?		No	
Is $v_3$ or $v_{av34} > 1.5 v_{12} / 2$		No	
If yes, $v_{12A} =$		(Equation 25-18)	

----- Flow Entering Diverge Influence Area -----

	Actual	Max Desirable	Violation?
$v_{12}$	1152	4600	No

----- Level of Service Determination (if not F) -----

Density,  $D = 4.252 + 0.0086 v_{12} - 0.009 L_D = 0.7$  pc/mi/ln

Level of service for ramp-freeway junction areas of influence A

----- Speed Estimation -----

Intermediate speed variable,	D = 0.431	
Space mean speed in ramp influence area,	S <sub>R</sub> = 52.2	mph
Space mean speed in outer lanes,	S <sub>0</sub> = N/A	mph
Space mean speed for all vehicles,	S = 52.2	mph

Phone: Fax:  
E-mail:

-----Merge Analysis-----

Analyst: Josh Anderson  
 Agency/Co.: David Evans & Associates, Inc.  
 Date performed: 12/21/2011  
 Analysis time period: PM Peak Period  
 Freeway/Dir of Travel: US 26 Eastbound  
 Junction: Jackson School Rd Interchange  
 Jurisdiction: ODOT  
 Analysis Year: 2011  
 Description: Eastbound On-Ramp from Jackson School Rd

-----Freeway Data-----

Type of analysis	Merge		
Number of lanes in freeway	2		
Free-flow speed on freeway	60.0	mph	
Volume on freeway	1025	vph	

-----On Ramp Data-----

Side of freeway	Right		
Number of lanes in ramp	1		
Free-flow speed on ramp	35.0	mph	
Volume on ramp	610	vph	
Length of first accel/decel lane	500	ft	
Length of second accel/decel lane		ft	

-----Adjacent Ramp Data (if one exists)-----

Does adjacent ramp exist?	No		
Volume on adjacent Ramp		vph	
Position of adjacent Ramp			
Type of adjacent Ramp			
Distance to adjacent Ramp		ft	

-----Conversion to pc/h Under Base Conditions-----

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	1025	610		vph
Peak-hour factor, PHF	0.92	0.96		
Peak 15-min volume, v15	279	159		v
Trucks and buses	1	1		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade		%	%	%
Length		mi	mi	mi
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.995	0.995	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	1120	639	pcph

----- Estimation of V12 Merge Areas -----

L = (Equation 25-2 or 25-3)

EQ

P = 1.000 Using Equation 0

FM

v = v (P ) = 1120 pc/h

12 F FM

----- Capacity Checks -----

		Actual	Maximum	LOS F?
v		1759	4600	No
FO				
v	v	0 pc/h	(Equation 25-4 or 25-5)	
3 or av34				
Is v	v	> 2700 pc/h?	No	
3 or av34				
Is v	v	> 1.5 v /2	No	
3 or av34		12		
If yes, v	=		(Equation 25-8)	
12A				

----- Flow Entering Merge Influence Area -----

	Actual	Max Desirable	Violation?
v	1120	4400	No
12			

----- Level of Service Determination (if not F) -----

Density, D = 5.475 + 0.00734 v<sub>R</sub> + 0.0078 v<sub>12</sub> - 0.00627 L<sub>A</sub> = 15.8 pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

----- Speed Estimation -----

Intermediate speed variable,	M = 0.309	
	S	
Space mean speed in ramp influence area,	S = 54.4	mph
	R	
Space mean speed in outer lanes,	S = N/A	mph
	0	
Space mean speed for all vehicles,	S = 54.4	mph

Phone: Fax:  
E-mail:

-----Diverge Analysis-----

Analyst: Josh Anderson  
Agency/Co.: David Evans & Associates, Inc.  
Date performed: 12/21/2011  
Analysis time period: PM Peak  
Freeway/Dir of Travel: US 26 Westbound  
Junction: Jackson School Rd Interchange  
Jurisdiction: ODOT  
Analysis Year: 2011  
Description: Westbound Off-ramp to Jackson School Rd

-----Freeway Data-----

Type of analysis	Diverge		
Number of lanes in freeway	2		
Free-flow speed on freeway	60.0	mph	
Volume on freeway	2080	vph	

-----Off Ramp Data-----

Side of freeway	Right		
Number of lanes in ramp	1		
Free-Flow speed on ramp	35.0	mph	
Volume on ramp	560	vph	
Length of first accel/decel lane	1500	ft	
Length of second accel/decel lane		ft	

-----Adjacent Ramp Data (if one exists)-----

Does adjacent ramp exist?	No		
Volume on adjacent ramp		vph	
Position of adjacent ramp			
Type of adjacent ramp			
Distance to adjacent ramp		ft	

-----Conversion to pc/h Under Base Conditions-----

Junction Components	Freeway	Ramp	Adjacent Ramp	
Volume, V (vph)	2080	560		vph
Peak-hour factor, PHF	0.93	0.93		
Peak 15-min volume, v15	559	151		v
Trucks and buses	1	3		%
Recreational vehicles	0	0		%
Terrain type:	Level	Level		
Grade	0.00	%	0.00	%
Length	0.00	mi	0.00	mi
Trucks and buses PCE, ET	1.5	1.5		
Recreational vehicle PCE, ER	1.2	1.2		

Heavy vehicle adjustment, fHV	0.995	0.985	
Driver population factor, fP	1.00	1.00	
Flow rate, vp	2248	611	pcph

----- Estimation of V12 Diverge Areas -----

L = (Equation 25-8 or 25-9)

EQ

P = 1.000 Using Equation 0

FD

$v_{12} = v_R + (v_F - v_R) P = 2248$  pc/h

12 R F R FD

----- Capacity Checks -----

	Actual	Maximum	LOS F?
$v = v_{12}$	2248	4600	No
$v_{Fi} = v_F - v_R$	1637	4600	No
$v_R$	611	2000	No
$v_3$ or $v_{av34}$	0 pc/h	(Equation 25-15 or 25-16)	
Is $v_3$ or $v_{av34} > 2700$ pc/h?		No	
Is $v_3$ or $v_{av34} > 1.5 v_{12} / 2$		No	
If yes, $v_{12A} =$		(Equation 25-18)	

----- Flow Entering Diverge Influence Area -----

	Actual	Max Desirable	Violation?
$v_{12}$	2248	4600	No

----- Level of Service Determination (if not F) -----

Density,  $D = 4.252 + 0.0086 v_R - 0.009 L_D = 10.1$  pc/mi/ln

Level of service for ramp-freeway junction areas of influence B

----- Speed Estimation -----

Intermediate speed variable,	D = 0.483	
Space mean speed in ramp influence area,	S <sub>R</sub> = 51.3	mph
Space mean speed in outer lanes,	S <sub>0</sub> = N/A	mph
Space mean speed for all vehicles,	S = 51.3	mph





## **Appendix F. Hazardous Materials Databases Information**



# Oregon DEQ Facility Profiler 2.0

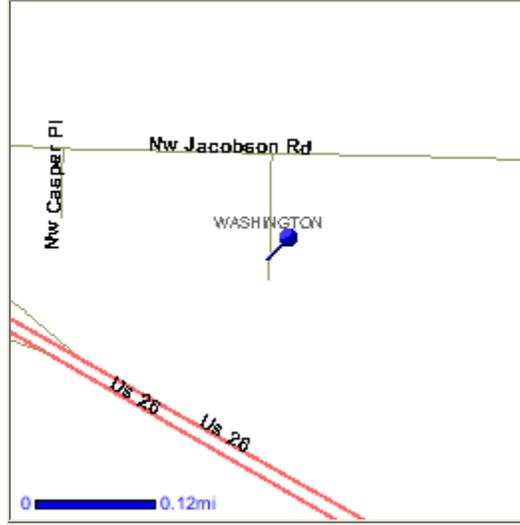
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## Facility Summary Report

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### Facility / Site Information for Location 10536

<b>Facility/Site Name:</b>	SHINEI USA INC	<b>Latitude:</b>	45° 33' 50"
<b>Address:</b>	6220 NW PINEFARM PL	<b>Longitude:</b>	-122° 55' 5"
<b>City State Zip:</b>	HILLSBORO OR 97124-8563	<b>Location Accuracy:</b>	HIGH
		<b>Last Updated:</b>	4/1/2004 5:20:00 PM

### Aliases

Shinei USA Inc	HazWaste	Shinei USA, Inc.	TRAACS
Solectron	HazWaste		

### Geographic Features

<b>Township:</b>	T1N-R2W-S0	<b>Congress Dist:</b>	1	<b>Forest Type:</b>	N/A
<b>County:</b>	WASHINGTON	<b>OR Senate Dist:</b>	15	<b>Vegetation:</b>	Urban and industrial
<b>Watershed:</b>	TUALATIN	<b>OR House Dist:</b>	30	<b>Agricultural Land:</b>	PREDOM IRR
<b>Drinking Water Source:</b>	N/A				

### Oregon DEQ Program Information

#### [Hazardous Waste \(HazWaste\)](#)

Identifier	Start Date	Effective Date	Review Date	NFA Date	Type	Sub Type	Detail Information <sup>1</sup>	EPA Number
6309	05/27/1998	12/03/2007			Generator	CEG	<a href="#">HW Site Report</a>	ORQ000009092

SIC CODE	SIC Description	PRIMARY
3499	FABRICATED METAL PRODUCTS	N

<sup>1</sup> Linked reports may be unavailable from 9:00pm to 7:00am PST due to system maintenance.

<sup>2</sup> DEQ does not maintain air discharge permit information for Lane County.

### More Information on this location

[Oregon DEQ Neighborhood Info \(by region/county\)](#)  
[See wells in the same Township Range Section from the Oregon Water Resources Department Well logs Application](#)  
[See county's scanned assessor maps through ORMAP](#)

[\[DEQ's Privacy Notice\]](#) [\[Contact DEQ\]](#) [\[Application Feedback\]](#)

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# Oregon DEQ Facility Profiler 2.0

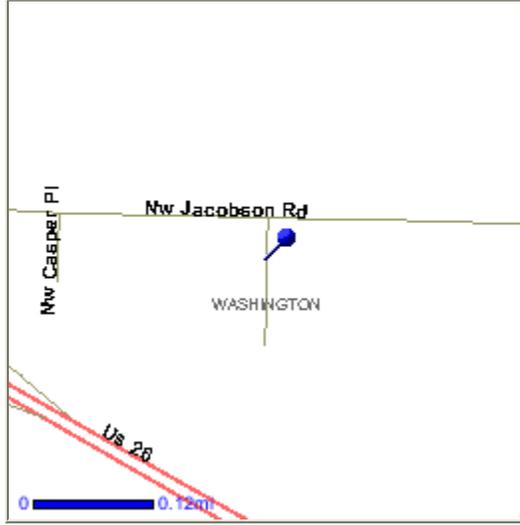
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## Facility Summary Report

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### Maps



### Facility / Site Information for Location 97188

<b>Facility/Site Name:</b>	CREDENCE SYSTEMS CORPORATION	<b>Latitude:</b>	45° 33' 53.3"
<b>Address:</b>	5975 NW PINEFARM PL	<b>Longitude:</b>	-122° 55' 5.9"
<b>City State Zip:</b>	HILLSBORO OR 97124-8563	<b>Location Accuracy:</b>	HIGH
		<b>Last Updated:</b>	6/20/2006 7:46:08 PM

### Aliases

CREDENCE SYSTEMS CORPORATION      HazWaste

### Geographic Features

<b>Township:</b>	T1N-R2W-S0	<b>Congress Dist:</b>	1	<b>Forest Type:</b>	N/A
<b>County:</b>	WASHINGTON	<b>OR Senate Dist:</b>	15	<b>Vegetation:</b>	Urban and industrial
<b>Watershed:</b>	TUALATIN	<b>OR House Dist:</b>	30	<b>Agricultural Land:</b>	PREDOM IRR
<b>Drinking Water Source:</b>	N/A				

### Oregon DEQ Program Information

#### [Hazardous Waste \(HazWaste\)](#)

Identifier	Start Date	Effective Date	Review Date	NFA Date	Type	Sub Type	Detail Information <sup>1</sup>	EPA Number
6969	05/10/2006	12/31/2008		12/31/2008	Generator	CEG	<a href="#">HW Site Report</a>	ORQ000025677

<sup>1</sup> Linked reports may be unavailable from 9:00pm to 7:00am PST due to system maintenance.

<sup>2</sup> DEQ does not maintain air discharge permit information for Lane County.

### More Information on this location

[Oregon DEQ Neighborhood Info \(by region/county\)](#)  
[See wells in the same Township Range Section from the Oregon Water Resources Department Well logs Application](#)  
[See county's scanned assessor maps through ORMAP](#)

[\[DEQ's Privacy Notice\]](#) [\[Contact DEQ\]](#) [\[Application Feedback\]](#)

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### Facility / Site Information for Location 107147

<b>Facility/Site Name:</b>	GENENTECH INC	<b>Latitude:</b>	45° 33' 25.9"
<b>Address:</b>	4625 NW Brookwood Parkway	<b>Longitude:</b>	-122° 55' 34.3"
<b>City State Zip:</b>	HILLSBORO OR 97124-9332	<b>Location Accuracy:</b>	HIGH
		<b>Last Updated:</b>	1/12/2011 2:05:30 PM

### Aliases

Genentech Inc	HazWaste	Genentech, Inc.	TRAACS
---------------	----------	-----------------	--------

### Geographic Features

<b>Township:</b>	T1N-R2W-S21	<b>Congress Dist:</b>	1	<b>Forest Type:</b>	N/A
<b>County:</b>	WASHINGTON	<b>OR Senate Dist:</b>	15	<b>Vegetation:</b>	Urban and industrial
<b>Watershed:</b>	TUALATIN	<b>OR House Dist:</b>	30	<b>Agricultural Land:</b>	PREDOM IRR
<b>Drinking Water Source:</b>	N/A				

### Oregon DEQ Program Information

#### Hazardous Waste (HazWaste)

Identifier	Start Date	Effective Date	Review Date	NFA Date	Type	Sub Type	Detail Information <sup>1</sup>	EPA Number
7160	04/07/2008	12/31/2010			Generator	SQG	<a href="#">HW Site Report</a>	ORQ000027521

#### Air Quality Permits (TRAACS)

Air Quality Permit	Start Date	Effective Date	Review Date	Closed Date	Status	Type	Sub Type	Detail Information <sup>1</sup>	EPA Number
34-9507-BS-01	10/11/2007	10/05/2007	10/01/2017		Active	ACDP	Basic	<a href="#">AQ Report</a>	OR06709507

SIC CODE	SIC Description	PRIMARY
2834	PHARMACEUTICAL PREPARATIONS	Y
4961	STEAM SUPPLY	N

<sup>1</sup> Linked reports may be unavailable from 9:00pm to 7:00am PST due to system maintenance.

<sup>2</sup> DEQ does not maintain air discharge permit information for Lane County.

### More Information on this location

[Oregon DEQ Neighborhood Info \(by region/county\)](#)  
[See wells in the same Township Range Section from the Oregon Water Resources Department Well logs Application](#)  
[See county's scanned assessor maps through ORMAP](#)

[\[DEQ's Privacy Notice\]](#) [\[Contact DEQ\]](#) [\[Application Feedback\]](#)

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# Oregon DEQ Facility Profiler 2.0

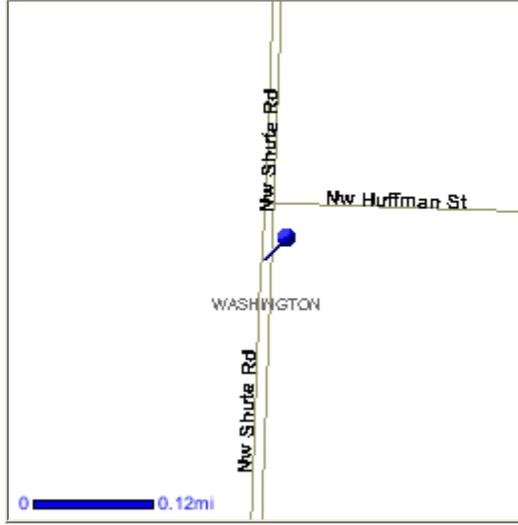
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## Facility Summary Report

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### Facility / Site Information for Location 10716

<b>Facility/Site Name:</b>	SGL CARBON CORPORATION	<b>Latitude:</b>	45° 33' 22.3199"
<b>Address:</b>	4860 NW SHUTE RD	<b>Longitude:</b>	-122° 55' 34.6799"
<b>City State Zip:</b>	HILLSBORO OR 97124	<b>Location Accuracy:</b>	HIGH
		<b>Last Updated:</b>	4/26/2002 5:05:15 PM

### Aliases

SGL Carbon Corporation	HazWaste	SGL Carbon Corporation	TRAACS
------------------------	----------	------------------------	--------

### Geographic Features

<b>Township:</b>	T1N-R2W-S21	<b>Congress Dist:</b>	1	<b>Forest Type:</b>	N/A
<b>County:</b>	WASHINGTON	<b>OR Senate Dist:</b>	15	<b>Vegetation:</b>	Urban and industrial
<b>Watershed:</b>	TUALATIN	<b>OR House Dist:</b>	30	<b>Agricultural Land:</b>	PREDOM IRR
<b>Drinking Water Source:</b>	N/A				

### Oregon DEQ Program Information

#### [Hazardous Waste \(HazWaste\)](#)

Identifier	Start Date	Effective Date	Review Date	NFA Date	Type	Sub Type	Detail Information <sup>1</sup>	EPA Number
3626	04/20/1998	01/15/2003		09/01/2002	Generator	CEG	<a href="#">HW Site Report</a>	ORQ000008839

SIC CODE	SIC Description	PRIMARY
3624	CARBON AND GRAPHITE PRODUCTS	N

<sup>1</sup> Linked reports may be unavailable from 9:00pm to 7:00am PST due to system maintenance.

<sup>2</sup> DEQ does not maintain air discharge permit information for Lane County.

### More Information on this location

[Oregon DEQ Neighborhood Info \(by region/county\)](#)  
[See wells in the same Township Range Section from the Oregon Water Resources Department Well logs Application](#)  
[See county's scanned assessor maps through ORMAPP](#)

[\[DEQ's Privacy Notice\]](#) [\[Contact DEQ\]](#) [\[Application Feedback\]](#)

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## Facility Summary Report

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### Facility / Site Information for Location 10368

<b>Facility/Site Name:</b>	TOKAI CARBON USA INC	<b>Latitude:</b>	45° 33' 9"
<b>Address:</b>	4495 NW 235TH AVE	<b>Longitude:</b>	-122° 55' 5"
<b>City State Zip:</b>	HILLSBORO OR 97124-5846	<b>Location Accuracy:</b>	HIGH
		<b>Last Updated:</b>	4/1/2004 2:45:00 PM

### Aliases

TOKAI CARBON	WQSIS	TOKAI CARBON U.S.A.	WQSIS
Tokai Carbon U.S.A., Inc.	TRAACS	Tokai Carbon USA Inc	HazWaste

### Geographic Features

<b>Township:</b>	T1N-R2W-S0	<b>Congress Dist:</b>	1	<b>Forest Type:</b>	N/A
<b>County:</b>	WASHINGTON	<b>OR Senate Dist:</b>	15	<b>Vegetation:</b>	Urban and industrial
<b>Watershed:</b>	TUALATIN	<b>OR House Dist:</b>	30	<b>Agricultural Land:</b>	PREDOM IRR
<b>Drinking Water Source:</b>	N/A				

### Oregon DEQ Program Information

#### [Hazardous Waste \(HazWaste\)](#)

Identifier	Start Date	Effective Date	Review Date	NFA Date	Type	Sub Type	Detail Information <sup>1</sup>	EPA Number
5973	04/22/1997	12/31/2003			Generator	CEG	<a href="#">HW Site Report</a>	ORQ000006114

SIC CODE	SIC Description	PRIMARY
3624	CARBON AND GRAPHITE PRODUCTS	N

#### [Water Quality Permits \(WQSIS\)](#)

File Number	Permit Number	Start date	Effective Date	Review Date	Permit Type	Permit SubType	Comments	Status	Detail Information <sup>1</sup>	Permit Status
109693	15627	11/14/1997	11/17/1997	06/30/2012	STORMWATER MINOR	NPDES General Permit - Industrial storm water discharges	GEN12Z Industrial storm water	Active Renew no eff mod	<a href="#">SIS Detail Report</a>	<a href="#">Permit Status</a>

SIC CODE	SIC Description	PRIMARY
3624	CARBON AND GRAPHITE PRODUCTS	Y

<sup>1</sup> Linked reports may be unavailable from 9:00pm to 7:00am PST due to system maintenance.

<sup>2</sup> DEQ does not maintain air discharge permit information for Lane County.

# Oregon DEQ Facility Profiler 2.0

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## Facility Summary Report

[Return to Site Listing](#) [Print Report](#)

### Maps



### Facility / Site Information for Location 9977

<b>Facility/Site Name:</b>	AGPR INC	<b>Latitude:</b>	45° 33' 3"
<b>Address:</b>	4375 NW 235TH AVE	<b>Longitude:</b>	-122° 55' 6"
<b>City State Zip:</b>	HILLSBORO OR 97124-5852	<b>Location Accuracy:</b>	HIGH
		<b>Last Updated:</b>	3/24/2004 4:51:00 PM

### Aliases

AFG Industries, Inc.	TRAACS	AG Electronic Materials aka AGEM	HazWaste
AGC Electronics America	TRAACS	AGPR A Division of AFG Industries Inc	HazWaste
AGPR Inc	HazWaste	AGPR, Inc.	TRAACS

### Geographic Features

<b>Township:</b>	T1N-R2W-S34	<b>Congress Dist:</b>	1	<b>Forest Type:</b>	N/A
<b>County:</b>	WASHINGTON	<b>OR Senate Dist:</b>	15	<b>Vegetation:</b>	Urban and industrial
<b>Watershed:</b>	TUALATIN	<b>OR House Dist:</b>	30	<b>Agricultural Land:</b>	PREDOM IRR
<b>Drinking Water Source:</b>	N/A				

### Oregon DEQ Program Information

#### [Hazardous Waste \(HazWaste\)](#)

Identifier	Start Date	Effective Date	Review Date	NFA Date	Type	Sub Type	Detail Information <sup>1</sup>	EPA Number
3526	09/04/1996	01/01/2004			Generator	CEG	<a href="#">HW Site Report</a>	ORQ000004093

SIC CODE	SIC Description	PRIMARY
3674	SEMICONDUCTORS	N

#### [Air Quality Permits \(TRAACS\)](#)

Air Quality Permit	Start Date	Effective Date	Review Date	Closed Date	Status	Type	Sub Type	Detail Information <sup>1</sup>	EPA Number
34-0016-SI-01	10/06/2006	02/09/1996	08/01/2011		Active	ACDP	Simple	<a href="#">AQ Report</a>	OR06700016

SIC CODE	SIC Description	PRIMARY
3559	OTHER SPECIAL IND. MACHINERY	Y

<sup>1</sup> Linked reports may be unavailable from 9:00pm to 7:00am PST due to system maintenance.

<sup>2</sup> DEQ does not maintain air discharge permit information for Lane County.

### More Information on this location

[Oregon DEQ Neighborhood Info \(by region/county\)](#)

# Oregon DEQ Facility Profiler 2.0

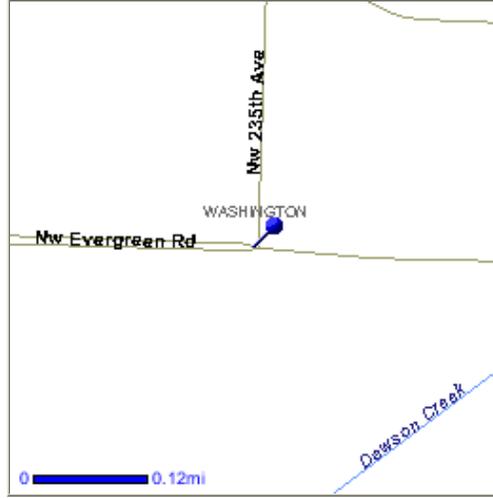
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## Facility Summary Report

[Return to Site Listing](#) [Print Report](#)

### Maps



### Facility / Site Information for Location 30726

**Facility/Site Name:** ASHLAND INC.  
**Address:** 4605 NW 235th Ave  
**City State Zip:** Hillsboro OR 97124-5879

**Latitude:** 45° 33' 3"  
**Longitude:** -122° 55' 6"  
**Location Accuracy:** LOW  
**Last Updated:** 3/22/2007 7:40:28 AM

### Aliases

Air Products and Chemicals Inc	HazWaste	Ashland Distribution Co A Div of Ashland	HazWaste
Ashland Inc.	TRAACS	Hewlett Packard at Ashland Spec Chem	HazWaste
Hewlett Packard at Rinchem Company, Inc.	HazWaste		

### Geographic Features

<b>Township:</b> T1N-R2W-S34	<b>Congress Dist:</b> 1	<b>Forest Type:</b> N/A
<b>County:</b> WASHINGTON	<b>OR Senate Dist:</b> 15	<b>Vegetation:</b> Urban and industrial
<b>Watershed:</b> TUALATIN	<b>OR House Dist:</b> 30	<b>Agricultural Land:</b> PREDOM IRR
<b>Drinking Water Source:</b> N/A		

### Oregon DEQ Program Information

#### [Hazardous Waste \(HazWaste\)](#)

Identifier	Start Date	Effective Date	Review Date	NFA Date	Type	Sub Type	Detail Information <sup>1</sup>	EPA Number
2205	06/28/1999	12/31/2007			Generator	CEG	<a href="#">HW Site Report</a>	ORQ000012195
4456	03/23/2001	12/31/2003		12/31/2003	Generator	CEG	<a href="#">HW Site Report</a>	ORQ000017392

SIC CODE	SIC Description	PRIMARY
3577	COMPUTER PERIPHERAL EQUIP, nec	N
5169	CHEMICALS & ALLIED PRODUCTS	N

<sup>1</sup> Linked reports may be unavailable from 9:00pm to 7:00am PST due to system maintenance.

<sup>2</sup> DEQ does not maintain air discharge permit information for Lane County.

### More Information on this location

[Oregon DEQ Neighborhood Info \(by region/county\)](#)  
[See wells in the same Township Range Section from the Oregon Water Resources Department Well logs Application](#)  
[See county's scanned assessor maps through ORMAP](#)

[\[DEQ's Privacy Notice\]](#) [\[Contact DEQ\]](#) [\[Application Feedback\]](#)

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# Oregon DEQ Facility Profiler 2.0

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## Facility Summary Report

[Return to Site Listing](#) [Print Report](#)

### Maps



### Facility / Site Information for Location 48397

<b>Facility/Site Name:</b>	Intel Corporation Evergreen Campus	<b>Latitude:</b>	45° 33' 3.24"
<b>Address:</b>	23225 NW EVERGREEN	<b>Longitude:</b>	-122° 55' 2.64"
<b>City State Zip:</b>	HILLSBORO OR 97124-5767	<b>Location Accuracy:</b>	HIGH
		<b>Last Updated:</b>	3/3/2004 6:54:00 PM

### Aliases

Intel Corporation Evergreen	HazWaste	Intel Corporation Evergreen Campus	HazWaste
-----------------------------	----------	------------------------------------	----------

### Geographic Features

<b>Township:</b>	T1N-R2W-S34	<b>Congress Dist:</b>	1	<b>Forest Type:</b>	N/A
<b>County:</b>	WASHINGTON	<b>OR Senate Dist:</b>	15	<b>Vegetation:</b>	Urban and industrial
<b>Watershed:</b>	TUALATIN	<b>OR House Dist:</b>	30	<b>Agricultural Land:</b>	PREDOM IRR
<b>Drinking Water Source:</b>	N/A				

### Oregon DEQ Program Information

#### [Hazardous Waste \(HazWaste\)](#)

Identifier	Start Date	Effective Date	Review Date	NFA Date	Type	Sub Type	Detail Information <sup>1</sup>	EPA Number
3415	02/25/2003	12/31/2006			Generator	CEG	<a href="#">HW Site Report</a>	ORQ000022152

SIC CODE	SIC Description	PRIMARY
7376	COMPUTER FACILITIES MANAGEMENT	N

<sup>1</sup> Linked reports may be unavailable from 9:00pm to 7:00am PST due to system maintenance.  
<sup>2</sup> DEQ does not maintain air discharge permit information for Lane County.

### More Information on this location

[Oregon DEQ Neighborhood Info \(by region/county\)](#)  
[See wells in the same Township Range Section from the Oregon Water Resources Department Well logs Application](#)  
[See county's scanned assessor maps through ORMAPP](#)

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## Incident with ID number 734699 (1982-2010)

Search Criteria Used (More)	
Reporting Year	ALL <input type="button" value="GO"/>
Level of Detail	Extended <input type="button" value="GO"/>
Type of Report Output	Text (HTML) <input type="button" value="GO"/>

**Reporting Year: 2004**

### Incident ID #1 : 734699

#### Call Recordkeeping

Incident ID Number	734699
Date Call Received	09/10/2004
Date Call Complete	09/10/2004
Call Type	Incident
Source of Report	TELEPHONE

#### Suspected Responsible Party

Resp. Company	COLUMBIA CORP
Resp. Organization Type	PRIVATE ENTERPRISE
Resp. City	HILLSBORO
Resp. State	OR
On Behalf Of	N

#### Incident Description

Incident Description	THE CALLER STATED THAT THE SUSPECTED RESPONSIBLE PARTY IS BUILDING A MACHINERY, THE MACHINERY WAS OVERFLOWED AND HYDRAULIC OIL WAS SPILLED ON THE GROUND.
Incident Type	FIXED
Incident Date / Time	9/7/2004 13:00
Incident Date	09/07/2004
Incident Occurred/ Discovered/ Planned	OCCURRED
Additional Info	THE CALLER HAD NO ADDITIONAL INFORMATION

#### Incident Location (Incident ID #1 : 734699)

Location Address	5775 NORTHWEST WAGONWAY
City Near Location	HILLSBORO
Location State	OR
Location County	WASHINGTON
Distance From City	0

#### Material

Chris Code	OHY
Amount Of Material	150
Amount Of Material Units	GALLON(S)
Name of Material	HYDRAULIC OIL
Material Reached Water	YES
Amount In Water	150
Amount In Water Units	GALLON(S)

#### Impact Information

Fire Involved (Yes/No)	No
Evacuations (Yes/No)	No
Number Evacuated	0
Radius of Evacuation	0
Injuries (Yes/No)	No
Number Injured	0
Number Hospitalized	0
Fatalities (Yes/No)	No
Number Fatalities	0

Property Damage (Yes/No)	No
Property Damage (in Dollars)	0
Air Corridor Closed (Yes/No)	No
Air Corridor Closure Time	0
Waterway Closed (Yes/No)	No
Waterway Closure Time	0
Road Closed (Yes/No)	No
Road Closure Time	0
Major Artery (Yes/No)	No
Track Closed (Yes/No)	No
Track Closure Time	0
Media Interest	NONE
Medium Description	WATER
Additional Medium Info	UNNAMED POND
Employee Fatalities	0
Passenger Fatalities	0
Community Impact (Yes/No)	No
Employee Injuries	0
Passenger Injuries	0
Occupant Fatalities	0
Passengers Transferred	UNK

**Continuous Release**  (Incident ID #1 : 734699)

All data fields in this section were blank.

**Remedial Action** 

Remedial Action	NONE
-----------------	------

**Drilling Platform Details** 

All data fields in this section were blank.

**Fixed Object Details** 

Type of Fixed Object	OTHER
Power Gen. Facility (Yes/No)	No
Structure Operating (Yes/No)	Unknown

**Mobile Incident** 

Road Mile Marker	0
Bus Service Disruption Time	0

**Pipeline Details**  (Incident ID #1 : 734699)

Pipeline Above Ground	ABOVE
Pipeline Exposed Underwater (Yes/No)	No

**Railroad Incident** 

Grade Crossing (Yes/No)	No
Crossing Device Operational (Yes/No)	Yes
Brake Failure (Yes/No)	No
Sub-Part C Testing Required	XXX
Passenger Route	XXX
Passenger Delay	XXX

**Storage Tank Details** 

Tank Above Ground	ABOVE
-------------------	-------

**Aircraft Details** 

All data fields in this section were blank.

**Vessel Incident**  (Incident ID #1 : 734699)

Allision (Yes/No) No

**Weather** 

Weather Conditions UNKNOWN

**Material In Water** 

Body of Water	UNNAMED POND
Water Supply Contaminated (Yes/No)	No
Offshore (Yes/No)	No

**Unknown Sheen Details** 

All data fields in this section were blank.

**Disused Fields** 

All data fields in this section were blank.

**Record Counts**  (Incident ID #1 : 734699)

Number of Materials Records	1
Number of CR Materials Records	0
Number of Mobile Vehicle Records	0
Number of Train Records	0
Number of Derailed Train Records	0
Number of Vessel Records	0

---

Total incidents for reporting year 2004: 1

---

\*END OF REPORT\*

This search was done on April 5, 2011. It was compiled from government data last released on January 04, 2011. The data were obtained from the U.S. Coast Guard's **Emergency Response Notification System** database (ERNS).

Search Criteria Used	
Reporting Year	ALL <input type="button" value="GO"/>
Incident ID Number	734699
Level of Detail	Extended <input type="button" value="GO"/>
Type of Report Output	Text (HTML) <input type="button" value="GO"/>

## Incident with ID number 532122 (1982-2010)

Search Criteria Used (More)	
Reporting Year	ALL <input type="button" value="GO"/>
Level of Detail	Extended <input type="button" value="GO"/>
Type of Report Output	Text (HTML) <input type="button" value="GO"/>

Reporting Year: 2000

### Incident ID #1 : 532122

#### Call Recordkeeping

Incident ID Number	532122
Date Call Received	06/14/2000
Date Call Complete	06/14/2000
Call Type	Incident
Incident ID Number	532122
Call Taker	TRF7665

#### Suspected Responsible Party

On Behalf Of N

#### Incident Description

Incident Description	THE CALLER STATED THAT HE HAS A VERY BAD ODOR AROUND HIS HOUSE, AND BELIEVES IT IS CAUSING HIS FAMILY HARM. HE BELIEVES THAT EITHER THE PLANT DOWN THE ROAD, OR A PERSON DUMPING "WHITE WASH," IS RESPONSIBLE FOR THE RELEASE.
Incident Type	FIXED
Incident Date / Time	6/14/2000 12:00
Incident Date	06/14/2000
Incident Occurred/ Discovered/ Planned	DISCOVERED
Additional Info	THE CALLER STATED THAT HIS FAMILY'S SKIN IS PEELING, DUE TO THIS RELEASE. HE HAS NOTICED THIS FOR ABOUT 3 WEEKS. HE ALSO SAID THAT THE RELEASE LEAVES AN OILY RESIDUE IN HIS MOUTH.
Unknown: WMD_CHEM_FLAG	No
Radioactive Materials (Yes/No)	No
Biological Materials (Yes/No)	No
Unknown: MILITARY_ORG_FLAG	No

#### Incident Location (Incident ID #1 : 532122)

Location Address	23585 NORTHWEST JACOBSEN
Location Street 1	ROAD SPACE 30
City Near Location	HILLSBORO
Location State	OR
Location County	WASHINGTON
Distance From City	0

#### Material

Chris Code	NCC
Amount Of Material	0
Name of Material	ACID WASH
Material Reached Water	YES
Amount In Water	0

#### Impact Information

Fire Involved (Yes/No)	No
Evacuations (Yes/No)	No
Number Evacuated	0
Radius of Evacuation	0
Injuries (Yes/No)	No

Number Injured	0
Number Hospitalized	0
Fatalities (Yes/No)	No
Number Fatalities	0
Property Damage (Yes/No)	No
Property Damage (in Dollars)	0
Air Corridor Closed (Yes/No)	No
Air Corridor Closure Time	0
Waterway Closed (Yes/No)	No
Waterway Closure Time	0
Road Closed (Yes/No)	No
Road Closure Time	0
Major Artery (Yes/No)	No
Track Closed (Yes/No)	No
Track Closure Time	0
Media Interest	NONE
Medium Description	WATER
Additional Medium Info	WELL WATER
Employee Fatalities	0
Passenger Fatalities	0
Community Impact (Yes/No)	No
Employee Injuries	0
Passenger Injuries	0
Occupant Fatalities	0
Passengers Transferred	UNK

**Continuous Release**  (Incident ID #1 : 532122)

All data fields in this section were blank.

**Remedial Action** 

Remedial Action	NONE
-----------------	------

**Drilling Platform Details** 

All data fields in this section were blank.

**Fixed Object Details** 

Type of Fixed Object	OTHER
Power Gen. Facility (Yes/No)	No
Structure Operating (Yes/No)	Unknown

**Mobile Incident** 

Road Mile Marker	0
Bus Service Disruption Time	0

**Pipeline Details**  (Incident ID #1 : 532122)

Pipeline Above Ground	ABOVE
Pipeline Exposed Underwater (Yes/No)	No

**Railroad Incident** 

Grade Crossing (Yes/No)	No
Crossing Device Operational (Yes/No)	Yes
Brake Failure (Yes/No)	No
Railroad Hotline	No
Sub-Part C Testing Required	XXX
Passenger Route	XXX
Passenger Delay	XXX

**Storage Tank Details** 

Tank Above Ground ABOVE

**Aircraft Details** ?

All data fields in this section were blank.

**Vessel Incident** ? (Incident ID #1 : 532122)

Allision (Yes/No) No

**Weather** ?

Weather Conditions	PARTLY CLOUDY
Air Temperature	75
Wind Speed	5
Wind Direction	S
Wind Speed Units	MPH

**Material In Water** ?

Body of Water	DRINKING WATER
Tributary Of	NOT APPLICABLE
Water Supply Contaminated (Yes/No)	Yes
Current Speed Units	M
Offshore (Yes/No)	No

**Unknown Sheen Details** ?

Sheen Odor BURNING SKIN

**Disused Fields** ? (Incident ID #1 : )

All data fields in this section were blank.

**Record Counts** ?

Number of Materials Records	1
Number of CR Materials Records	0
Number of Mobile Vehicle Records	0
Number of Train Records	0
Number of Derailed Train Records	0
Number of Vessel Records	0

Total incidents for reporting year 2000: 1

\*END OF REPORT\*

This search was done on April 5, 2011. It was compiled from government data last released on January 04, 2011. The data were obtained from the U.S. Coast Guard's [Emergency Response Notification System](#) database (ERNS).

Search Criteria Used	
Reporting Year	ALL <input type="button" value="GO"/>
Incident ID Number	532122
Level of Detail	Extended <input type="button" value="GO"/>
Type of Report Output	Text (HTML) <input type="button" value="GO"/>

## Incident with ID number 373088 (1982-2010)

Search Criteria Used (More)	
Reporting Year	ALL <input type="button" value="GO"/>
Level of Detail	Extended <input type="button" value="GO"/>
Type of Report Output	Text (HTML) <input type="button" value="GO"/>

**Reporting Year: 1997**

### Incident ID #1 : 373088

#### Call Recordkeeping ?

Incident ID Number	373088
Date Call Received	01/14/1997
Date Call Complete	01/14/1997
Call Type	Incident
Incident ID Number	373088
Call Taker	CJB1740

#### Suspected Responsible Party ?

Resp. Company	PACIFIC GAS & ELECTRIC
Resp. Organization Type	PUBLIC UTILITY
Resp. State	OR
Resp. Last Name	HAGAN
Resp. First Name	STEVE
Resp. Phone 1	5037019278
Resp. Phone Type 1	PRIMARY
On Behalf Of	N

#### Incident Description ?

Incident Description	PAD MOUNTED TRANSFORMER PUNCTURED
Incident Type	FIXED
Incident Cause	EQUIPMENT FAILURE
Incident Date / Time	1/13/1997 9:30
Incident Date	01/13/1997
Incident Occurred/ Discovered/ Planned	DISCOVERED

#### Incident Location ? (Incident ID #1 : 373088)

Location Address	25300 NW EVERGREEN RD
City Near Location	HILLSBORO
Location State	OR
Location County	WASHINGTON
Distance From City	0

#### Material ?

Chris Code	OTF
Amount Of Material	0
Name of Material	OIL, MISC: TRANSFORMER
Material Reached Water	YES
Amount In Water	0

#### Impact Information ?

Fire Involved (Yes/No)	No
Evacuations (Yes/No)	No
Number Evacuated	0
Number Injured	0
Number Fatalities	0
Property Damage (Yes/No)	No
Property Damage (in Dollars)	0
Air Corridor Closed (Yes/No)	No

Road Closed (Yes/No)	No
Medium Description	LAND
Additional Medium Info	SOIL
Passengers Transferred	UNK

**Continuous Release**  (Incident ID #1 : 373088)

All data fields in this section were blank.

**Remedial Action** 

All data fields in this section were blank.

**Drilling Platform Details** 

All data fields in this section were blank.

**Fixed Object Details** 

Structure Operating (Yes/No)	Yes
------------------------------	-----

**Mobile Incident** 

All data fields in this section were blank.

**Pipeline Details** 

Pipeline Above Ground	ABOVE
-----------------------	-------

**Railroad Incident**  (Incident ID #1 : 373088)

Grade Crossing (Yes/No)	No
Crossing Device Operational (Yes/No)	Yes
Brake Failure (Yes/No)	No
Railroad Hotline	No
Sub-Part C Testing Required	XXX
Passenger Route	XXX
Passenger Delay	XXX

**Storage Tank Details** 

Tank Above Ground	ABOVE
-------------------	-------

**Aircraft Details** 

All data fields in this section were blank.

**Vessel Incident** 

Allision (Yes/No)	No
-------------------	----

**Weather**  (Incident ID #1 : 373088)

All data fields in this section were blank.

**Material In Water** 

All data fields in this section were blank.

**Unknown Sheen Details** 

All data fields in this section were blank.

**Disused Fields** 

All data fields in this section were blank.

**Record Counts** 

Number of Materials Records	1
Number of CR Materials Records	0
Number of Mobile Vehicle Records	0

Number of Train Records	0
Number of Derailed Train Records	0
Number of Vessel Records	0

Total incidents for reporting year 1997: 1

\*END OF REPORT\*

This search was done on April 13, 2011. It was compiled from government data last released on January 04, 2011. The data were obtained from the U.S. Coast Guard's [Emergency Response Notification System](#) database (ERNS).

Search Criteria Used	
Reporting Year	ALL <input type="button" value="GO"/>
Incident ID Number	373088
Level of Detail	Extended <input type="button" value="GO"/>
Type of Report Output	Text (HTML) <input type="button" value="GO"/>



# Oregon DEQ Facility Profiler 2.0

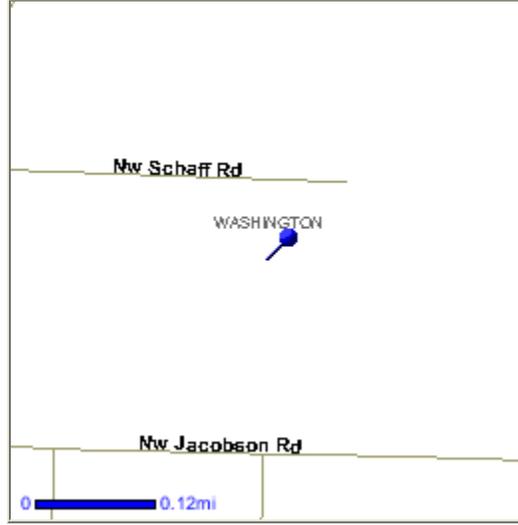
[Help] [Close Window]



## Facility Summary Report

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### Maps



### Facility / Site Information for Location 109109

<b>Facility/Site Name:</b>	BAKER SITE - HILLSBORO	<b>Latitude:</b>	45° 34' 5.2"
<b>Address:</b>	EAST OF HELVETIA, SOUTH OF SCHAFF RD	<b>Longitude:</b>	-122° 55' 5.9"
<b>City State Zip:</b>	HILLSBORO OR 97124	<b>Location Accuracy:</b>	HIGH
		<b>Last Updated:</b>	9/22/2008 11:32:06 AM

### Aliases

Baker Site - Hillsboro ECSI

### Geographic Features

<b>Township:</b>	T1N-R2W-S0	<b>Congress Dist:</b>	1	<b>Forest Type:</b>	N/A
<b>County:</b>	WASHINGTON	<b>OR Senate Dist:</b>	15	<b>Vegetation:</b>	Urban and industrial
<b>Watershed:</b>	TUALATIN	<b>OR House Dist:</b>	30	<b>Agricultural Land:</b>	PREDOM IRR
<b>Drinking Water Source:</b>	N/A				

### Oregon DEQ Program Information

#### [Environmental Cleanup \(ECSI\)](#)

Operation ID	Start Date	NFA Date	Permit Type	Permit SubType	Status	Detail Information <sup>1</sup>	EPA Number
5082	09/02/2008	02/10/2009	Contaminated Site		No further action required	<a href="#">ECSI Site Report</a>	

<sup>1</sup> Linked reports may be unavailable from 9:00pm to 7:00am PST due to system maintenance.

<sup>2</sup> DEQ does not maintain air discharge permit information for Lane County.

### More Information on this location

[Oregon DEQ Neighborhood Info \(by region/county\)](#)  
[See wells in the same Township Range Section from the Oregon Water Resources Department Well logs Application](#)  
[See county's scanned assessor maps through ORMAP](#)

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# Oregon DEQ Facility Profiler 2.0

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## Facility Summary Report

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### Maps



### Facility / Site Information for Location 89082

**Facility/Site Name:** SHUTE ROAD PROPERTY, CITY OF HILLSBORO  
**Address:** EVERGREEN PKWY AND SHUTE ROAD  
**City State Zip:** HILLSBORO OR 97124

**Latitude:** 45° 33' 31.7"  
**Longitude:** -122° 55' 45.5"  
**Location Accuracy:** HIGH  
**Last Updated:** 6/24/2005 2:39:12 PM

### Aliases

Shute Road, City of Hillsboro ECSI

### Geographic Features

**Township:** T1N-R2W-S21 **Congress Dist:** 1 **Forest Type:** N/A  
**County:** WASHINGTON **OR Senate Dist:** 15 **Vegetation:** Agricultural cropland and pastureland  
**Watershed:** TUALATIN **OR House Dist:** 30 **Agricultural Land:** PREDOM IRR  
**Drinking Water Source:** N/A

### Oregon DEQ Program Information

#### [Environmental Cleanup \(ECSI\)](#)

Operation ID	Start Date	NFA Date	Permit Type	Permit SubType	Status	Detail Information <sup>1</sup>	EPA Number
4436	06/01/2004	06/22/2005	Contaminated Site		No further action required	<a href="#">ECSI Site Report</a>	

<sup>1</sup> Linked reports may be unavailable from 9:00pm to 7:00am PST due to system maintenance.

<sup>2</sup> DEQ does not maintain air discharge permit information for Lane County.

### More Information on this location

[Oregon DEQ Neighborhood Info \(by region/county\)](#)  
[See wells in the same Township Range Section from the Oregon Water Resources Department Well logs Application](#)  
[See county's scanned assessor maps through ORMAP](#)

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## Incidents by Zip Code

IncZipCode	IncNumber	IncLocation	IncCity	IncDate	DeptRsp	Chem1	AmtReleased	Comments
97124	050028	111 NE LINCOLN St	HILLSBORO	5/19/2005	HILLSBORO FIRE DEPT	REQUEST REPORT		Responded to assist in white powder scare at a county facility in Hillsboro.
97124	980107	1400 NW COMPTON DR	HILLSBORO	5/20/1998	HAZMAT TEAM TUALATIN	HYDROGEN SULFIDE	0	UNKNOWN QUANTITY OF SULFER DIOXIDE RELEASED INSIDE A CYLINDER CABINET LOCATED INSIDE MANUFACTURING PLANT. INITIAL MONITORING EQUIPMENT SHOWED 136 PPM INSIDE CABINET AND 1 PPM INSIDE ROOM. CYLINDER WAS SHUT OFF BY MAINTENANCE TECH AND READING DROPPED TO 1 PPM INSIDE ROOM AND 2 PPM INSIDE CABINET. LEAKING CYLINDER WILL BE REPLACED TOMORROW. AIR SCRUBBER IN OPERATION THROUGHOUT EVENT BUT HEAVY ODOR OF SULFER NOTICED DURING RELEASE OF H2S. FOR FUTHER INFORMATION REFER TO TVF&R INCIDENT NUMBER 98012247. H2S CONTAINED IN A 6" DIAMETERX11/2"CYLINDER. CONCENTRATION WAS .4% GAGE READ 170 PSI AT THE BOTTLE AND 20 PSI AT THE REGULATOR.
97124	950135	150 N FIRST AVE	HILLSBORO	3/19/1995	HILLSBORO FIRE DEPT	DRUG LAB CHEMICALS	0	OSFM NOTE: NO COMMENTS GIVEN
97124-	980666	188TH & EVERGREEN PKY	HILLSBORO	11/3/1998	HILLSBORO FIRE DEPT	DIESEL FUEL	0	SPILL OF DIESEL ALONG EVERGREEN PARKWAY, BY UNKNOWN TRUCK., MOST LIKELY FROM ITS FUEL TANK. WASH. CO. LUT PROVIDE CLEANUP MATERIALS AND CREW.
97124	910017	19600 NW VON NEWMAN DR	HILLSBORO	11/5/1991	HAZMAT TEAM TUALATIN	CHLOROFORM	1 GALLONS	OSFM NOTE: NO COMMENTS GIVEN
97124	920227	21420 NW NICHOLAS	HILLSBORO	8/4/1992	HILLSBORO FIRE DEPT	SULFURIC ACID	0	ONE 12 VOLT AUTOMOTIVE BATTERY WAS LEFT ON CHARGER TOO LONG AND OVERHEATED. SULFURIC ACID FUMES FILLED OCCUPANCY AND ALERTED OCCUPANTS IN NEIGHBORING BUSINESS UNIT. AREA WAS EVACUTED AND BUILDING WAS VENTILATED. BATTERY WAS REMOVED TO REMOTE AREA FOR LATER DISPOSAL.
97124	880112	22800 NW EVERGREEN RD	HILLSBORO	10/3/1988	HILLSBORO FIRE DEPT	UNKNOWN CHEMICAL	5 GALLONS	15. BEING IDENTIFIED THROUGH LAB TEST WITH PEGUSUS WASTE MANAGEMENT. 20. TEST BEING PERFORMED AT THIS TIME. RESULTS ARE NOT EXPECTED BACK FOR 8-10 DAYS.
97124	090001	2300 NE BROOKWOOD Pky	HILLSBORO	1/6/2009	HILLSBORO FIRE DEPT	REQUEST REPORT		TriQuint is a semiconductor manufacturer. During normal operations inside a clean-

								<p>room a worker incorrectly combined two chemicals in a poly sink. The worker was wearing a chemical suit and respiratory protection at the time of the accident. Directly above the sink is a ventilation hood that goes to an air scrubber that uses water and caustic soda. This mixture results in a sudden release of CN gas and may cause some heat. The building was evacuated. TriQuint called a clean-up company to deal with the hazard and also 911. we were called by C-1 from Hillsboro Fire to respond and do an "onsite recon" of the mixture to ensure it was stable until the clean-up company could arrive and remove the mixture. We contacted the manufacture of the CN product and confirmed that the air scrubber in place would take care of the release. They assured us the scrubber was adequate for the job. We entered in "level A" suits and visualized the sink containing the mixture from outside the clean room through a window. The Mixture appeared stable, with no foaming of vaporizing of chemicals and no deforming of the sink seen. We used two CN monitors and received no positive readings. We used our entry camera to broadcast live video, allowing the TriQuint personnel to evaluate the conditions. We also showed a recording of this to the clean-up company.</p>
97124	920064	231ST & CAMPUS DR	HILLSBORO	4/7/1992	HILLSBORO FIRE DEPT	UNKNOWN CHEMICAL	0	<p>PASSERBY REPORTED UNKNOWN CONTAINER IN DITCH ALONG ROADWAY. HILLSBORO FIRE, WASH. CO. L.U.T. HILLSBORO POLICE, UNIFIED SEWERAGE AGENCY ALL WERE PRESENT ON SCENE. CONTAINER WAS A BLUE PLASTIC 7-GAL CONTAINER MARKED ZEP, WHICH ORIGINALLY SHOULD HAVE CONTAINED A CLEANSER OR SOLVENT TYPE SUBSTANCE. UPON EXAMINATION BY FIRE CREWS, IT WAS DETERMINED THAT THE CONTAINER WAS FILLED WITH A MATERIAL SIMILAR TO PAINT SLUDGE &amp; WAS NOT DEEMED TO E A TRUE "HAZMAT" INCIDENT REQUIRING ACTIVATION OF THE REGIONAL RESPONSE TEAM. PHONE COMMUNICATIONS WITH DEQ, OERS, &amp; COUNTY EMERGENCY SERVICES ALL SUGGESTED NOTIFICATION OF</p>

								RESPONSIBLE JURISDICTION FOR REMOVAL OF CONTAINER. CITY OF HILLSBORO PUBLIC WORKS WAS NOTIFIED. THEY RESPONDED, PICKED UP THE CONTAINER & PLACED IT WITH THE CITY COLLECTIONS AWAITING DISPOSAL. REFER TO OERS INCIDENT #92-504.
97124	930010	2380 NE CORNELL RD	HILLSBORO	2/11/1993	HILLSBORO FIRE DEPT	GASOLINE	900 GALLONS	DEQ WAS CALLED IN IMMEDIATELY. AREA WAS TAPED OFF & RESTRICTED TO THE PUBLIC. JOEL JEFFERY FROM BRAUN INTERTECT WAS ON SCENE FOR EVIRONMRNTAL. GEORGE KNEESE WAS CALLED TO THE SITE FROM PUBLIC WORKS. A SMALL TRENCH WAS DUG & PRODUCT WAS SUCKED OFF THE TOP OF STANDING WATER. THE TANK WAS SCHEDULED TO BE DECOMMISSIONED & REMOVED ON 12 FEBRUARY 1993 IN THE MORNING, AS APPROVED & DIRECTED BY DEQ, WHO ARRIVED ON SCENE WITH 2 INSPECTORS (ANDREE POLOCK & RACHEL CARLIN SEGEL). U-HAUL REPS WERE DIRECTED TO HAVE SOMEONE STAY OVER NIGHT AT THE BUILDING TO ENSURE NO PUBLIC WILL ENTER THE SPILL AREA. INSPECTOR FOSTER CONDUCTED A SITE INSPECTION & WITNESSED THE REMOVAL & DECOMMISSION OF THE SAID TANK. DAVE WEISEN, MARKETING MANAGER FOR U-HAUL ADVISED DEQ & MYSELF THAT THE SOIL WOULD BE TRANSPORTED TO TIGARD TO BE BURNED OFF.
97124	880219	24945 NW EVERGREEN RD	HILLSBORO	1/9/1988	HILLSBORO FIRE DEPT	DIESEL FUEL	30 GALLONS	A 2200 GALLON DIESEL DELIVERY TRUCK LOADED WITH DIESEL TIPPED SIDEWAYS INTO A DITCH WHEN THE FRONT WHEEL WENT OFF ROAD, & THE DIRT SHOULDER COLLAPSED. THE TRUCK WAS TRAVELING AT APPROX AT 20 MPH. THE PRODUCT TANK REMAINED INTACT, & THE CARGO WAS EVENTUALLY PUMPED INTO ANOTHER VEHICLE. THE LEAK OCCURRED BECAUSE THE VEHICLES FUEL TANK LEAKED THROUGH THE CAP & VENT. THERE MAY HAVE BEEN SOME SEEPAGE OF PRODUCT THROUGH THE VAPOR RECOVERY SYSTEM.

97124	960583	2501 NW 229TH AVENUE	HILLSBORO	11/18/1996	HILLSBORO FIRE DEPT	ACETIC ACID	2 CF	AN INTEL EMPLOYEE WAS CLEANING OUT A TANK THAT HAD BEEN EMPTIED & FLUSHED WITH CHEMICALS TO RENDER THE ACETIC ACID NEUTRAL. DURING THIS PROCESS, HEAT WAS APPLIED AS ROUTINE & WHEN HE CLIMBED THE LADDER TO THE TOP OF THE TANK, A SMALL PUFF OF STEAM WAS RELEASED INTO HIS FACE. ACCORDING TO THE EMERGENCY RESPONSE TEAM LEADER, MOST OF THE MIXTURE IN THE TANK WAS WATER & ONLY A VERY MINUTE AMOUNT WAS ACETIC ACID. THE ERT TEAM WAS CLEARING THE BUILDING OF PERSONNEL WHILE WEARING SCBA. UPON OUR ARRIVAL, THEY NOTED NO FURTHER HAZARD. THE PATIENT INITIALLY COMPLAINED OF CHEST DISCOMFORT, AFTER HE WAS PLACED ON OXYGEN, HE FELT BETTER, NO BLOOD IN THE MUCOUS AREA OF HIS FACE; HE WAS TRANSPORTED TO ST VINCENT HOSPITAL FOR OBSERVATION.
97124	940413	2700 NW GLENCOE ROAD	HILLSBORO	9/14/1994	HILLSBORO FIRE DEPT	UNKNOWN CHEMICAL	0	UNIDENTIFIED STUDENT PUT A 16 OZ PLASTIC SOFT DRINK BOTTLE OF UNKNOWN CHEMICALS IN AN INTERIOR HALLWAY TRASH CAN DURING SCHOOL HOURS WHEN THE HALLS WERE OCCUPIED. THE RESULTANT EXOTHERMIC REACTION OF THE CHEMICALS CAUSED THE BOTTLE TO MELT, IGNITED PAPER TRASH & MELTED THE TRASH CAN'S PLASTIC LINER. THIS APPEARED TO BE AN INTENTIONAL ACT. THIS SMALL FIRE GENERATED ACRID SMOKE. NEARBY TEACHERS TOOK THE TRASH CAN THROUGH THE HALLWAY TO AN OUTSIDE LANDING, THEN NOTIFIED MAINTENANCE PERSONNEL. THE TEACHERS, & THE SUBSEQUENT MAINTENANCE PEOPLE, INHALED VAPORS IN THE SMOKE THAT THEY DESCRIBED AS SMELLING LIKE CHLORINE & ACID. NO MEDICAL COMPLAINTS WERE MADE. THERE WAS NOT SUFFICIENT SMOKE OR FIRE TO ACTIVATE DETECTORS OR SPRINKLERS, NO PART OF

								THE SCHOOL WAS EVACUATED. FIREFIGHTERS WERE CALLED TO INVESTIGATE. WE FOUND THE TRASH CAN HAD BEEN REMOVED TO THE DUMPSTER AREA OUTSIDE THE CAFETERIA, WHERE IT WAS BEING OBSERVED BY MAINTENANCE STAFF. THE SCENE WAS TAPED OFF & A PEDESTRIAN-CONTROL PERIMETER WAS ESTABLISHED. A FIREFIGHTER IN SCBA APPROACHED THE CAN & LOOKED INSIDE, OBSERVING THAT ALL REACTIONS HAD APPARENTLY CEASED, THE TRASH CAN WAS COOL & NO OFF-GASSING WAS VISIBLE. WHEN SCBA WAS REMOVED, A SLIGHT SMELL OF CHLORINE WAS DETECTED. THE BOTTLE & SOME HALF-BURNED DEBRIS WERE TAKEN AS EVIDENCE, THE TRASH CAN WAS EMPTIED & FLUSHED OUT. NO DAMAGE WAS SEEN ON THE TRASH CAN ITSELF. AN ARSON I INVESTIGATION WAS INITIATED, TO BE FOLLOWED UP BY MYSELF & OFFICER MATT SHANNON OF HILLSBORO POLICE DEPT.
97124	930269	281ST & EVERGREEN RD	HILLSBORO	6/10/1993	HILLSBORO FIRE DEPT	ASPHALT	0	#14: NO SHIPPING PAPERS. MSDS PAPERS CARRIED IN CAB OF TRUCK. ROOFING ASPHALT TANK TRUCK WITH ASPHALT HEATED TO 500 DEGREES F. PRESSURE BUILT-UP IN TANK CAUSED EXPLOSION & CAUSED DOME HATCH COVER (2' DISK) TO BE BLOWN OFF. IGNITION OF HOT VAPOR OCCURED WITH INDUCTION OF FRESH AIR. FIRE CONTAINED TO TOP OF TRUCK & EACH OPENING. FIRE EXTINGUISHED WITH DRY CHEMICAL POWDER. HATCH COVERS REPLACED TO EXCLUDE ADDITIONAL FRESH AIR. TANK ALLOWED TO COOL. THERE WAS NO RELEASE OF PRODUCT. VAPORS & FIRE GASES WERE RELEASED.
97124	950650	3125 SE RIVER RD	HILLSBORO	12/19/1995	HAZMAT TEAM TUALATIN	SODIUM BISULFATE	0	DRIVER OF A 10,000 GAL TANKER OF SODIUM BISULFATE OFF LOADED INTO THE WRONG CONTAINMENT SYSTEM WHICH CONTAINED SODIUM HYPO CHLORIDE. IT REACTED, CREATING A FOG & PRESSURIZED THE TANK TRUCK. THE

								<p>RESULTING FOG VENTED ALSO CAUSING SOME PAINT TO PEEL ON THE</p>
97124	070049	3740 NW ALOCLEK PI	HILLSBORO	7/29/2007	HILLSBORO FIRE DEPT	REQUEST REPORT		<p>E34 on the air listening to dispatch when Hillsboro Fire dispatched for a commercial fire. Fire upgraded to a full box and upon pulling the information of the fire on the MDT, the narrative notes describe fire as in a warehouse where "chemicals are stored." Station 53 then called to have them look up address, company name to check chemicals stored. Captain Weiss located 25+ chemicals stored at business and C5 notified of potential hazard over MDT. With conference with Command, HFD requested HM Team response. Enroute informed Command the fire potentially involved a heavy metal and Poison Control notified for possible hazards. Notified command of hazards and requested a Level 1 decon for crews that were exposed. Upon arriving to scene, HM34 and HM53 set up off an off site recon while Team Leader (TL) and Safety met with IC and C5. Fire was out upon arrival, however, natural ventilation was occurring as building had been opened up during fire operations prior to arrival. It was decided with Command to do an on-site transition to entry to recon the structure and check to see what 200 gallon tanks were involved and if the on-site containment had held the potential volume of all the tanks. Team meeting, resource contacts made with Medical (Metro West Ambulance) was briefed of medical potential Entry Crews would have. Shortly after Team meeting, business owner as well as an Operations Manager arrived on scene. Team briefed for entry. Entry priorities will be recon inside, securing power inside structure and checking conditions inside. Entry camera used to verify that computer used to turn off heating elements potentially failed (scenario per business contacts) as conditions from entry crews described tank failure and locations. Entry made to structure, power turned off, computer room checked and then 200 gallon tanks as well as spill containment checked. Hillsboro Fire Investigator also had crews show him with camera specific places behind tank where heating element</p>

								had been located checked while they were in the IDLH environment. Level 1 decon provided for entry team and business owner, HFD command briefed of what was found. Scene left to HFD.
97124	920065	570 NE 53RD AVE	HILLSBORO	4/7/1992	HILLSBORO FIRE DEPT	ROCK AND SAND	0	PERSONNEL FROM SOLOFLEX MAIL ROOM RECEIVED A BOX CONTAINING SAND & ROCKS 6 APRIL 1992, AS PART OF THEIR PETITION EFFORT TO CLOSE TROJAN NUCLEAR PLANT. THEY DUMPED CONTENTS OUTSIDE IN FIELD NEAR THEIR WAREHOUSE. ON THE MORNING OF 7 APRIL, THE PERSONNEL WORRIED THAT THE CONTENTS MAY BE RADIOACTIVE, SO THAT CONTACTED WASH. CO. FIRE DIST. #2 FIRE CHIEF RICHARD DUYCK ABOUT THEIR CONCERN. CHIEF DUYCK IN TURN CONTACTED ON-DUTY ENGINE COMPANY, ACTING OFFICER LINDAUER, WHO IN TURN CONTACTED ME AS THE RRTA FOR THE AREA TO ASSESS THE SITUATION. I CONTACTED WASH. CO EMERGENCY MANAGEMENT WHO CONTACTED OERS & RADIATION CONTROL (MR. G. TOOMBS). UPON ARRIVAL AT SOLOFLEX I MADE CONTACT WITH JAN GILBERTSON, SECURED THE SITE & THEN MONITORED THE AREA & MATERIAL WITH THE CDVY00M. I FOUND NOTHING OVER THE BACKGROUND LEVELS OF RADIATION. I NOTIFIED WASH. CO. EMERG. MNGMNT & RADIATION CONTROL OF FINDINGS. HILLSBORO FIRE DEPARTMENT OPERATIONS CHIEF DENNIS ENGLAND ALSO ON SCENE. REFER TO OERS INCIDENT #92-505.
97124-	980659	616 NE SUNDANCE CT	HILLSBORO	9/7/1998	HILLSBORO FIRE DEPT	NATURAL GAS	0	NW NATURAL SUPERVISOR CAPPED LINE AND A REPAIR CREW WILL BE OUT 9/8/98 TO COMPLETE REPAIR.
97124	980285	616 NE SUNDANCE CT	HILLSBORO	9/7/1998	HILLSBORO FIRE DEPT	NATURAL GAS	0	NW NATURAL SUPERVISOR CAPPED LINE AND A REPAIR CREW WILL BE OUT 09/08/98 TO COMPLETE REPAIR.
97124	910144	7431 NE EVERGREEN PKWY	HILLSBORO	4/16/1991	HILLSBORO FIRE DEPT	GASOLINE	15 GALLONS	STATE OWNED VEHICLE ACCIDENTALLY BACKED INTO PARKING LOT LIGHT MOUNTING BASE. BOLTS OPENED UP GAS TANK SPILLING CONTENTS INTO

								PARKING LOT. WATER FOG USED TO CLEAR AIR AROUND AUTO. DAMAGE CONFINED TO GAS TANK.
97124	930274	764 NE 21ST AVE	HILLSBORO	6/25/1993	HILLSBORO FIRE DEPT	WAFER WASH	0	CONTAINERS FOUND IN RENTAL HOUSE AFTER OCCUPANTS EVICTED BY COURT. LAND OWNER REPORT TO POLICE, THEN POLICE NOTIFIED FIRE DEPARTMENT. UPON INVESTIGATION THERE WERE NO SPILLS. OWNER WAS INFORMED THEY WERE RESPONSIBLE FOR ITS REMOVAL & PROPER DISPOSAL. OWNER CALLED RIEDEL INTL & TALKED TO LARRY FUNICHELLO & HE WAS SENDING A CHEMIST TO SCENE TO INVESTIGATE CONTENTS OF THE 55 GAL DRUM. HAZ MAT #9 WAS ALSO CALLED. THEY COULDN'T DO ANYTHING BECAUSE OF NO SPILL, ETC. (PAT TURINA FROM TEAM RIEDEL).
97124	960556	845 NW 231ST AVE	HILLSBORO	11/12/1996	HILLSBORO FIRE DEPT	MINERAL OIL	20 GALLONS	TWO TRANSFORMERS WITH ELECTRICAL INSULATING OIL WERE BROKEN SPILLING CONTENTS OUT INTO STREET AND CONTAINED DIRT. DIESEL FUEL FROM ONE TANK WAS LEAKING INTO DITCH, LESS THAN 5 GALS. PGE HAZ. MAT. CLEAN-UP TEAM ARRIVED ON SITE AND PROCEEDED TO CLEAN UP AND CONTAIN BOTH MATERIALS. DEQ CONTACTED BY LT. NAYLOR.
97124	930344	855 NW 227TH AVENUE	HILLSBORO	8/4/1993	HILLSBORO FIRE DEPT	UNKNOWN CHEMICAL	0	FIRE DEPARTMENT WAS CALLED TO SCENE BY MARVIN SHARP (1345 NW 228TH; 648-2533). HE STATED THAT BETWEEN 0900&1000 HOURS THIS DATE, HE OBSERVED A PERSON HE KNOWS BY SIGHT, SWEEPING AN OILY MATERIAL OUT OF BACK END OF PANEL TRUCK & ON TO THE ROADWAY. HE THEN THREW THE RAGS USED IN THIS PROCESS INTO THE ADJACENT DITCH. SEEING MR. SHARP & HIS WIFE, DOROTHY, THIS PERSON HURRIEDLY GOT INTO THE VEHICLE & DROVE OFF. THE MATERIAL HAD LEFT AN APPROX 4' X 4' PATCH ON THE ROAD. THERE WAS STILL A SMALL AMOUNT OF LIQUID PRESENT ON MY ARRIVAL & I TOOK A SAMPLE OF THIS. I ALSO TOOK ONE OF THE RAGS & A PIPE CONNECTION AS EVIDENCE. I PHOTOGRAPHED THE

								SCENE. ENGINE 103 APPLIED ABSORBENT MATERIAL & SWEEPED THE ROADWAY. I CONTACTED GREG GRUNAW, THE DEQ DUTY OFFICER, & GAVE HIM THIS INFORMATION. HE SAID HE WOULD FORWARD IT TO THE APPROPRIATE PERSON FOR FOLLOW-UP.
97124	980284	HWY 26 @ MP 61	HILLSBORO	9/16/1998	HILLSBORO FIRE DEPT	DIESEL #2	30 GALLONS	NONE GIVEN
97124	970085	HWY 26 WB @ SHUTE RD	HILLSBORO	4/17/1997	HILLSBORO FIRE DEPT	DIESEL	135 GALLONS	THIS IS DIESEL FROM ONE FUEL TANK OF SEMI TRUCK INVOLVED IN MVA. ORS/ODOT/DEQ CONTACTED. ODOT HAS FOSS ENVIRONMENTAL & INFRASTRUCTURE TAKE OVER THE SCENE TO PERFORM CLEANUP
97124	950548	NW 219TH & BASELINE ST	HILLSBORO	10/10/1995	HAZMAT TEAM TUALATIN	DIESEL	30 GALLONS	DELIVERY VAN INVOLVED IN A MOTOR VEHICLE ACCIDENT. FUEL TANK STRUCK AND RIPPED OPEN SPILLING CONTENTS ON ROADWAY. TANK 30 GAL CAPACITY, 7 GAL PUMPED OUT AND RECOVERED. TANK WAS NEAR FULL AT TIME OF INCIDENT. ABSORBANT MATERIAL SPREAD OVER SPILL AREA AND
97124	980289	NW EVERGREEN/GLENCOE RD	HILLSBORO	8/19/1998	HILLSBORO FIRE DEPT	OIL	50 GALLONS	VEHICLE OIL SPILL APPROXIMATELY 50 GALLONS OVER 1 TO 2 MILES OF PUBLIC ROADWAY. NO RUNOFF OR EXPOSURE TO WATERWAY. OERS CONTACTED ALONG WITH DEQ. COUNTY AND CITY PUBLIC WORKS PROVIDED CLEAN UP UNDER ADVISEMENT OF DEQ "DON PETITT" BRETTHAUER OIL ASSISTED WITH ID ON SCENE. CONSULTED WITH HM9 WHICH OPTED NOT TO RESPOND INITIALLY AND WERE LATER ADVISED TO STANDBY AS CLEAN UP WAS UNDERWAY.



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### Facility / Site Information for Location 27018

**Facility/Site Name:** BAXTER, B HOT  
**Address:** 27700 NW MEEK ROAD  
**City State Zip:** HILLSBORO OR 97124

**Latitude:** 45° 33' 52.1"  
**Longitude:** -122° 55' 38.8"  
**Location Accuracy:** HIGH  
**Last Updated:** 12/22/1998 12:00:00 AM

### Aliases

BAXTER, B HOT LUST

### Geographic Features

**Township:** T1N-R2W-S21 **Congress Dist:** 1 **Forest Type:** N/A  
**County:** WASHINGTON **OR Senate Dist:** 15 **Vegetation:** Agricultural cropland and pastureland  
**Watershed:** TUALATIN **OR House Dist:** 30 **Agricultural Land:** PREDOM IRR  
**Drinking Water Source:** N/A

### Oregon DEQ Program Information

#### [Leaking Underground Storage Tanks \(LUST\)](#)

Log Number	Received	Cleanup Initiated	Cleanup Complete	Type	Heating Oil Tank	UST Facility ID	Status	Detail Information <sup>1</sup>
34-95-5166		08/06/1998		NON_REGULATED	HEATING_OIL_TANK		CLEANUP_COMPLETED	<a href="#">LUST Site Report</a>

<sup>1</sup> Linked reports may be unavailable from 9:00pm to 7:00am PST due to system maintenance.

<sup>2</sup> DEQ does not maintain air discharge permit information for Lane County.

### More Information on this location

[Oregon DEQ Neighborhood Info \(by region/county\)](#)  
[See wells in the same Township Range Section from the Oregon Water Resources Department Well logs Application](#)  
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### Facility / Site Information for Location 38833

**Facility/Site Name:** BERGER FARMS  
**Address:** 5888 NW SHUTE RD  
**City State Zip:** HILLSBORO OR 97124

**Latitude:** 45° 33' 44.3"  
**Longitude:** -122° 55' 24.2"  
**Location Accuracy:** HIGH  
**Last Updated:** 8/4/2010 3:50:21 PM

### Aliases

BERGER FARMS LUST

### Geographic Features

**Township:** T1N-R2W-S0      **Congress Dist:** 1      **Forest Type:** N/A  
**County:** WASHINGTON      **OR Senate Dist:** 15      **Vegetation:** Urban and industrial  
**Watershed:** TUALATIN      **OR House Dist:** 30      **Agricultural Land:** PREDOM IRR  
**Drinking Water Source:** N/A

### Oregon DEQ Program Information

#### [Leaking Underground Storage Tanks \(LUST\)](#)

Log Number	Received	Cleanup Initiated	Cleanup Complete	Type	Heating Oil Tank	UST Facility ID	Status	Detail Information <sup>1</sup>
34-01-0032		06/08/2001		NON_REGULATED			CLEANUP_STARTED	<a href="#">LUST Site Report</a>

<sup>1</sup> Linked reports may be unavailable from 9:00pm to 7:00am PST due to system maintenance.

<sup>2</sup> DEQ does not maintain air discharge permit information for Lane County.

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### Facility / Site Information for Location 43404

**Facility/Site Name:** BERGER FARMS HOT  
**Address:** 5870 NW 242ND AVE  
**City State Zip:** HILLSBORO OR 97124

**Latitude:** 45° 33' 43.6"  
**Longitude:** -122° 55' 32.2"  
**Location Accuracy:** HIGH  
**Last Updated:** 8/4/2010 3:14:18 PM

### Aliases

BERGER FARMS HOT LUST

### Geographic Features

**Township:** T1N-R2W-S0      **Congress Dist:** 1      **Forest Type:** N/A  
**County:** WASHINGTON      **OR Senate Dist:** 15      **Vegetation:** Urban and industrial  
**Watershed:** TUALATIN      **OR House Dist:** 30      **Agricultural Land:** PREDOM IRR  
**Drinking Water Source:** N/A

### Oregon DEQ Program Information

#### [Leaking Underground Storage Tanks \(LUST\)](#)

Log Number	Received	Cleanup Initiated	Cleanup Complete	Type	Heating Oil Tank	UST Facility ID	Status	Detail Information <sup>1</sup>
34-01-8373		06/12/2001		NON_REGULATED	HEATING_OIL_TANK		CLEANUP_COMPLETED	<a href="#">LUST Site Report</a>

<sup>1</sup> Linked reports may be unavailable from 9:00pm to 7:00am PST due to system maintenance.

<sup>2</sup> DEQ does not maintain air discharge permit information for Lane County.

### More Information on this location

[Oregon DEQ Neighborhood Info \(by region/county\)](#)  
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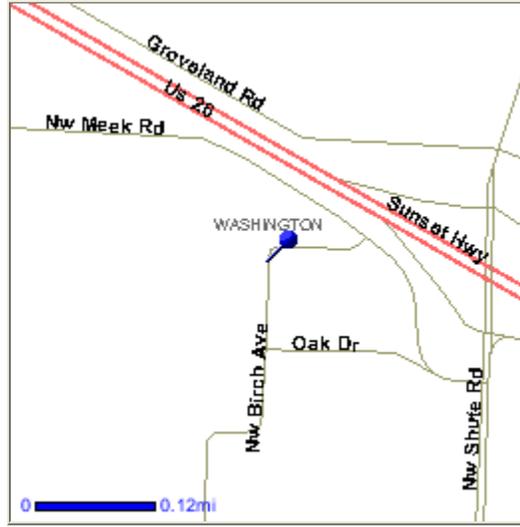
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### Facility / Site Information for Location 102830

<b>Facility/Site Name:</b>	LAAS, DONNIE	<b>Latitude:</b>	45° 33' 50.4"
<b>Address:</b>	6140 NW BIRCH AVE	<b>Longitude:</b>	-122° 55' 50.2"
<b>City State Zip:</b>	HILLSBORO OR 97124-8600	<b>Location Accuracy:</b>	HIGH
		<b>Last Updated:</b>	6/7/2007 8:20:41 AM

### Aliases

Laas, Donnie LUST

### Geographic Features

<b>Township:</b>	T1N-R2W-S21	<b>Congress Dist:</b>	1	<b>Forest Type:</b>	N/A
<b>County:</b>	WASHINGTON	<b>OR Senate Dist:</b>	15	<b>Vegetation:</b>	Agricultural cropland and pastureland
<b>Watershed:</b>	TUALATIN	<b>OR House Dist:</b>	30	<b>Agricultural Land:</b>	PREDOM IRR
<b>Drinking Water Source:</b>	N/A				

### Oregon DEQ Program Information

#### [Leaking Underground Storage Tanks \(LUST\)](#)

Log Number	Received	Cleanup Initiated	Cleanup Complete	Type	Heating Oil Tank	UST Facility ID	Status	Detail Information <sup>1</sup>
34-07-0796				NON_REGULATED	HEATING_OIL_TANK		CLEANUP_COMPLETED	<a href="#">LUST Site Report</a>

<sup>1</sup> Linked reports may be unavailable from 9:00pm to 7:00am PST due to system maintenance.

<sup>2</sup> DEQ does not maintain air discharge permit information for Lane County.

### More Information on this location

[Oregon DEQ Neighborhood Info \(by region/county\)](#)  
[See wells in the same Township Range Section from the Oregon Water Resources Department Well logs Application](#)  
[See county's scanned assessor maps through ORMAP](#)

[\[DEQ's Privacy Notice\]](#) [\[Contact DEQ\]](#) [\[Application Feedback\]](#)

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# Oregon DEQ Facility Profiler 2.0

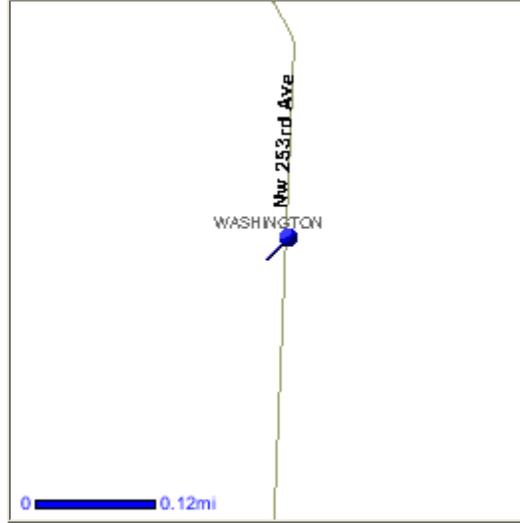
[Help] [Close Window]



## Facility Summary Report

[Return to Site Listing](#) [Print Report](#)

### Maps



### Facility / Site Information for Location 24899

<b>Facility/Site Name:</b>	HAGG, R HOT	<b>Latitude:</b>	45° 33' 19.1"
<b>Address:</b>	4825 NW 253RD AVE	<b>Longitude:</b>	-122° 56' 12.8"
<b>City State Zip:</b>	HILLSBORO OR 97124-5701	<b>Location Accuracy:</b>	HIGH
		<b>Last Updated:</b>	2/15/2006 8:06:00 AM

### Aliases

HAAG, RAY II	LUST	HAGG, R HOT	LUST
--------------	------	-------------	------

### Geographic Features

<b>Township:</b>	T1N-R2W-S21	<b>Congress Dist:</b>	1	<b>Forest Type:</b>	N/A
<b>County:</b>	WASHINGTON	<b>OR Senate Dist:</b>	15	<b>Vegetation:</b>	Agricultural cropland and pastureland
<b>Watershed:</b>	TUALATIN	<b>OR House Dist:</b>	30	<b>Agricultural Land:</b>	PREDOM IRR
<b>Drinking Water Source:</b>	N/A				

### Oregon DEQ Program Information

#### [Leaking Underground Storage Tanks \(LUST\)](#)

Log Number	Received	Cleanup Initiated	Cleanup Complete	Type	Heating Oil Tank	UST Facility ID	Status	Detail Information <sup>1</sup>
34-04-0494		03/30/2004		NON_REGULATED	HEATING_OIL_TANK		CLEANUP_COMPLETED	<a href="#">LUST Site Report</a>
34-90-0301		08/22/1990		NON_REGULATED	HEATING_OIL_TANK		CLEANUP_COMPLETED	<a href="#">LUST Site Report</a>

<sup>1</sup> Linked reports may be unavailable from 9:00pm to 7:00am PST due to system maintenance.

<sup>2</sup> DEQ does not maintain air discharge permit information for Lane County.

### More Information on this location

[Oregon DEQ Neighborhood Info \(by region/county\)](#)  
[See wells in the same Township Range Section from the Oregon Water Resources Department Well logs Application](#)  
[See county's scanned assessor maps through ORMAP](#)

[\[DEQ's Privacy Notice\]](#) [\[Contact DEQ\]](#) [\[Application Feedback\]](#)

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# Oregon DEQ Facility Profiler 2.0

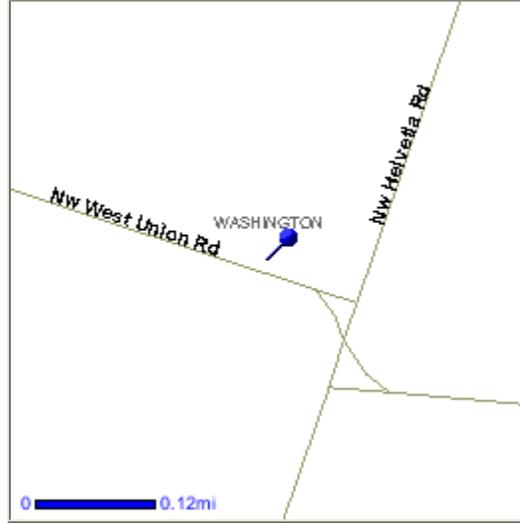
[Help] [Close Window]



## Facility Summary Report

[Return to Site Listing](#) [Print Report](#)

### Maps



### Facility / Site Information for Location 39221

**Facility/Site Name:** WEST UNION ELEMENTARY SCHOOL  
**Address:** 23870 NW WEST UNION RD  
**City State Zip:** HILLSBORO OR 97124

**Latitude:** 45° 34' 39"  
**Longitude:** -122° 55' 22"  
**Location Accuracy:** HIGH  
**Last Updated:** 9/29/2004 4:55:00 PM

### Aliases

WEST UNION ELEMENTARY SCHOOL                      LUST

### Geographic Features

**Township:** T1N-R2W-S10                      **Congress Dist:** 1                      **Forest Type:** N/A  
**County:** WASHINGTON                      **OR Senate Dist:** 17                      **Vegetation:** Urban and industrial  
**Watershed:** TUALATIN                      **OR House Dist:** 33                      **Agricultural Land:** PREDOM IRR  
**Drinking Water Source:** N/A

### Oregon DEQ Program Information

#### [Leaking Underground Storage Tanks \(LUST\)](#)

Log Number	Received	Cleanup Initiated	Cleanup Complete	Type	Heating Oil Tank	UST Facility ID	Status	Detail Information <sup>1</sup>
34-01-6518		07/23/2001		NON_REGULATED	HEATING_OIL_TANK		CLEANUP_COMPLETED	<a href="#">LUST Site Report</a>

<sup>1</sup> Linked reports may be unavailable from 9:00pm to 7:00am PST due to system maintenance.

<sup>2</sup> DEQ does not maintain air discharge permit information for Lane County.

### More Information on this location

[Oregon DEQ Neighborhood Info \(by region/county\)](#)  
[See wells in the same Township Range Section from the Oregon Water Resources Department Well logs Application](#)  
[See county's scanned assessor maps through ORMAPP](#)

[\[DEQ's Privacy Notice\]](#) [\[Contact DEQ\]](#) [\[Application Feedback\]](#)

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# Oregon DEQ Facility Profiler 2.0

[Help] [Close Window]



## Facility Summary Report

[Return to Site Listing](#) [Print Report](#)

### Maps



### Facility / Site Information for Location 35167

**Facility/Site Name:** SEVERSON PROPERTY  
**Address:** 23265 NE EVERGREEN PARKWAY  
**City State Zip:** HILLSBORO OR 97124

**Latitude:** 45° 33' 3.6"  
**Longitude:** -122° 55' 3.7"  
**Location Accuracy:** HIGH  
**Last Updated:** 3/21/2002 4:32:00 PM

### Aliases

SEVERSON PROPERTY LUST

### Geographic Features

**Township:** T1N-R2W-S0 **Congress Dist:** 1 **Forest Type:** N/A  
**County:** WASHINGTON **OR Senate Dist:** 15 **Vegetation:** Urban and industrial  
**Watershed:** TUALATIN **OR House Dist:** 30 **Agricultural Land:** PREDOM IRR  
**Drinking Water Source:** N/A

### Oregon DEQ Program Information

#### [Leaking Underground Storage Tanks \(LUST\)](#)

Log Number	Received	Cleanup Initiated	Cleanup Complete	Type	Heating Oil Tank	UST Facility ID	Status	Detail Information <sup>1</sup>
34-00-0633		05/01/2000		NON_REGULATED	HEATING_OIL_TANK		CLEANUP_COMPLETED	<a href="#">LUST Site Report</a>

<sup>1</sup> Linked reports may be unavailable from 9:00pm to 7:00am PST due to system maintenance.

<sup>2</sup> DEQ does not maintain air discharge permit information for Lane County.

### More Information on this location

[Oregon DEQ Neighborhood Info \(by region/county\)](#)  
[See wells in the same Township Range Section from the Oregon Water Resources Department Well logs Application](#)  
[See county's scanned assessor maps through ORMAP](#)

[\[DEQ's Privacy Notice\]](#) [\[Contact DEQ\]](#) [\[Application Feedback\]](#)

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**Appendix G. Oregon Historic Preservation Office  
Oregon Historic Site Records**



# Oregon Historic Site Record

LOCATION AND PROPERTY NAME			
<b>address:</b>	26385 NW Groveland Dr Hillsboro, Washington County	<b>historic name:</b>	Rice, Richard & Helen, House
<b>assoc addresses:</b>		<b>current/other names:</b>	Rice NW Museum Of Rocks And Minerals
<b>location descr:</b>		<b>block/lot/tax lot:</b>	
		<b>twshp/rng/sect/qtr sect:</b>	
PROPERTY CHARACTERISTICS			
<b>resource type:</b>	Building	<b>height (stories):</b>	1.0
<b>elig evaluation:</b>	eligible/significant	<b>total elig resources:</b>	4
<b>prim constr date:</b>	1953	<b>total inelig resources:</b>	2
		<b>NR Status:</b>	Individually Listed
		<b>second date:</b>	
		<b>date indiv listed:</b>	11/29/2006
<b>primary orig use:</b>	Single Dwelling	<b>orig use comments:</b>	
<b>second orig use:</b>		<b>prim style comments:</b>	
<b>primary style:</b>	Ranch (Type)	<b>sec style comments:</b>	
<b>secondary style:</b>		<b>siding comments:</b>	
<b>primary siding:</b>	Sandstone	<b>architect:</b>	Wayman, William F. (designer); Charles F. Walters (landscaper)
<b>secondary siding:</b>		<b>builder:</b>	Victor Batchelar
<b>plan type:</b>	Ranch/Rambler		
<b>comments/notes:</b>			
GROUPINGS / ASSOCIATIONS			
<b>Survey/Grouping Included In:</b>	<b>Type of Grouping</b>	<b>Date Listed</b>	<b>Date Compiled</b>
<b>Farmstead/Cluster Name:</b>			
SHPO INFORMATION FOR THIS PROPERTY			
<b>NR date listed:</b>	11/29/2006	106 Project(s)	
<b>ILS survey date:</b>		<b>SHPO Case</b>	<b>Date</b>
<b>RLS survey date:</b>		<b>Agency Effect Eval</b>	
<b>Gen file date:</b>			
ARCHITECTURAL / PROPERTY DESCRIPTION			
<i>(Includes expanded description of the building/property, setting, significant landscape features, outbuildings and alterations)</i>			
HISTORY			
<i>(Chronological, descriptive history of the property from its construction through at least the historic period - preferably to the present)</i>			
RESEARCH INFORMATION			
Title Records	Census Records	Property Tax Records	Local Histories
Sanborn Maps	Biographical Sources	SHPO Files	Interviews
Obituaries	Newspapers	State Archives	Historic Photographs
City Directories	Building Permits	State Library	
<b>Local Library:</b>		<b>University Library:</b>	
<b>Historical Society:</b>		<b>Other Respository:</b>	
<b>Bibliography:</b>			

# Oregon Historic Site Record

LOCATION AND PROPERTY NAME			
<b>address:</b>	W Union Rd West Union, Washington County	<b>historic name:</b>	West Union Baptist Church
<b>assoc addresses:</b>		<b>current/other names:</b>	
<b>location descr:</b>		<b>block/lot/tax lot:</b>	
		<b>townshp/rng/sect/qtr sect:</b>	01N 02W 14
PROPERTY CHARACTERISTICS			
<b>resource type:</b>	Building	<b>height (stories):</b>	1.0
<b>elig evaluation:</b>	eligible/significant	<b>total elig resources:</b>	1
<b>prim constr date:</b>	c.1853	<b>NR Status:</b>	Individually Listed
	<b>second date:</b>	<b>date indiv listed:</b>	07/10/1974
<b>primary orig use:</b>	Religious Facility	<b>orig use comments:</b>	
<b>second orig use:</b>		<b>prim style comments:</b>	
<b>primary style:</b>	Vernacular	<b>sec style comments:</b>	
<b>secondary style:</b>	Classical Revival: other	<b>siding comments:</b>	
<b>primary siding:</b>	Wood:Other/Undefined	<b>architect:</b>	Kane, William
<b>secondary siding:</b>		<b>builder:</b>	Unknown
<b>plan type:</b>			
<b>comments/notes:</b>			
GROUPINGS / ASSOCIATIONS			
<b>Survey/Grouping Included In:</b>	<b>Type of Grouping</b>	<b>Date Listed</b>	<b>Date Compiled</b>
<b>Farmstead/Cluster Name:</b>			
SHPO INFORMATION FOR THIS PROPERTY			
<b>NR date listed:</b>	07/10/1974	106 Project(s)	
<b>ILS survey date:</b>		<b>SHPO Case</b>	<b>Date</b>
<b>RLS survey date:</b>		<b>Agency Effect Eval</b>	
<b>Gen file date:</b>			
ARCHITECTURAL / PROPERTY DESCRIPTION			
<i>(Includes expanded description of the building/property, setting, significant landscape features, outbuildings and alterations)</i>			
HISTORY			
<i>(Chronological, descriptive history of the property from its construction through at least the historic period - preferably to the present)</i>			
RESEARCH INFORMATION			
Title Records	Census Records	Property Tax Records	Local Histories
Sanborn Maps	Biographical Sources	SHPO Files	Interviews
Obituaries	Newspapers	State Archives	Historic Photographs
City Directories	Building Permits	State Library	
<b>Local Library:</b>		<b>University Library:</b>	
<b>Historical Society:</b>		<b>Other Respository:</b>	
<b>Bibliography:</b>			

# Oregon Historic Site Record

LOCATION AND PROPERTY NAME			
<b>address:</b>	24665 NW Groveland Dr Hillsboro, Washington County	<b>historic name:</b>	Chambers, James & Mary, House
<b>assoc addresses:</b>		<b>current/other names:</b>	
<b>location descr:</b>		<b>block/lot/tax lot:</b>	
		<b>twtnshp/rng/sect/qtr sect:</b>	01N 02W 15
PROPERTY CHARACTERISTICS			
<b>resource type:</b>	Building	<b>height (stories):</b>	1.5
<b>elig evaluation:</b>	eligible/contributing	<b>total elig resources:</b>	
<b>prim constr date:</b>	c.1865	<b>NR Status:</b>	
		<b>date indiv listed:</b>	
<b>primary orig use:</b>	Single Dwelling	<b>orig use comments:</b>	
<b>second orig use:</b>		<b>prim style comments:</b>	
<b>primary style:</b>	Vernacular	<b>sec style comments:</b>	
<b>secondary style:</b>		<b>siding comments:</b>	
<b>primary siding:</b>	Horizontal Board	<b>architect:</b>	
<b>secondary siding:</b>	Wood:Other/Undefined	<b>builder:</b>	
<b>plan type:</b>			
<b>comments/notes:</b>			
GROUPINGS / ASSOCIATIONS			
<b>Survey/Grouping Included In:</b>	<b>Type of Grouping</b>	<b>Date Listed</b>	<b>Date Compiled</b>
<b>Farmstead/Cluster Name:</b>			
SHPO INFORMATION FOR THIS PROPERTY			
<b>NR date listed:</b>		106 Project(s)	
<b>ILS survey date:</b>		<b>SHPO Case</b>	<b>Date</b>
<b>RLS survey date:</b>		<b>Agency Effect Eval</b>	
<b>Gen file date:</b>			
ARCHITECTURAL / PROPERTY DESCRIPTION			
<i>(Includes expanded description of the building/property, setting, significant landscape features, outbuildings and alterations)</i>			
HISTORY			
<i>(Chronological, descriptive history of the property from its construction through at least the historic period - preferably to the present)</i>			
RESEARCH INFORMATION			
Title Records	Census Records	Property Tax Records	Local Histories
Sanborn Maps	Biographical Sources	SHPO Files	Interviews
Obituaries	Newspapers	State Archives	Historic Photographs
City Directories	Building Permits	State Library	
<b>Local Library:</b>		<b>University Library:</b>	
<b>Historical Society:</b>		<b>Other Respository:</b>	
<b>Bibliography:</b>			

# Oregon Historic Site Record

LOCATION AND PROPERTY NAME			
<b>address:</b>	4825 NW 253rd Ave Hillsboro, Washington County	<b>historic name:</b>	Shute, T W & Lizzie, House & Barn
<b>assoc addresses:</b>		<b>current/other names:</b>	
<b>location descr:</b>		<b>block/lot/tax lot:</b>	
		<b>twshp/rng/sect/qtr sect:</b>	01N 02W 21
PROPERTY CHARACTERISTICS			
<b>resource type:</b>	Building	<b>height (stories):</b>	2.0
<b>elig evaluation:</b>	eligible/contributing	<b>total elig resources:</b>	
<b>prim constr date:</b>	c.1890	<b>second date:</b>	1909
<b>total inelig resources:</b>		<b>NR Status:</b>	
<b>primary orig use:</b>	Single Dwelling	<b>date indiv listed:</b>	
<b>second orig use:</b>		<b>orig use comments:</b>	
<b>primary style:</b>	Queen Anne	<b>prim style comments:</b>	
<b>secondary style:</b>		<b>sec style comments:</b>	
<b>primary siding:</b>	Horizontal Board	<b>siding comments:</b>	
<b>secondary siding:</b>	Shingle	<b>architect:</b>	
<b>plan type:</b>		<b>builder:</b>	
<b>comments/notes:</b>			
GROUPINGS / ASSOCIATIONS			
<b>Survey/Grouping Included In:</b>	<b>Type of Grouping</b>	<b>Date Listed</b>	<b>Date Compiled</b>
<b>Farmstead/Cluster Name:</b>			
SHPO INFORMATION FOR THIS PROPERTY			
<b>NR date listed:</b>		106 Project(s)	
<b>ILS survey date:</b>		<b>SHPO Case</b>	<b>Date</b>
<b>RLS survey date:</b>		<b>Agency Effect Eval</b>	
<b>Gen file date:</b>			
ARCHITECTURAL / PROPERTY DESCRIPTION			
<i>(Includes expanded description of the building/property, setting, significant landscape features, outbuildings and alterations)</i>			
HISTORY			
<i>(Chronological, descriptive history of the property from its construction through at least the historic period - preferably to the present)</i>			
RESEARCH INFORMATION			
Title Records	Census Records	Property Tax Records	Local Histories
Sanborn Maps	Biographical Sources	SHPO Files	Interviews
Obituaries	Newspapers	State Archives	Historic Photographs
City Directories	Building Permits	State Library	
<b>Local Library:</b>		<b>University Library:</b>	
<b>Historical Society:</b>		<b>Other Respository:</b>	
<b>Bibliography:</b>			

# Oregon Historic Site Record

LOCATION AND PROPERTY NAME			
<b>address:</b>	21860 NW Imbrie Dr Hillsboro, Washington County	<b>historic name:</b>	Imbrie Farm
<b>assoc addresses:</b>	Rt 1 Box 223; 4045 NW Cornelius Pass Rd	<b>current/other names:</b>	Imbrie, Robert, House; Imbrie, Frank, Farmstead
<b>location descr:</b>		<b>block/lot/tax lot:</b>	
		<b>twshp/rng/sect/qtr sect:</b>	01N 02W 23
PROPERTY CHARACTERISTICS			
<b>resource type:</b>	Building	<b>height (stories):</b>	2.0
<b>elig evaluation:</b>	eligible/significant	<b>total elig resources:</b>	4
<b>prim constr date:</b>	1866	<b>NR Status:</b>	Individually Listed
		<b>date indiv listed:</b>	02/15/1977
<b>primary orig use:</b>	Farmstead	<b>orig use comments:</b>	
<b>second orig use:</b>	Agric. Outbuilding	<b>prim style comments:</b>	
<b>primary style:</b>	Italianate	<b>sec style comments:</b>	
<b>secondary style:</b>		<b>siding comments:</b>	
<b>primary siding:</b>	Wood:Other/Undefined	<b>architect:</b>	Unknown
<b>secondary siding:</b>		<b>builder:</b>	Unknown
<b>plan type:</b>			
<b>comments/notes:</b>			
CR-B			
GROUPINGS / ASSOCIATIONS			
<b>Survey/Grouping Included In:</b>	<b>Type of Grouping</b>	<b>Date Listed</b>	<b>Date Compiled</b>
Hillsboro Local Inventory Update 2008	Survey & Inventory Project		2008
<b>Farmstead/Cluster Name:</b>			Imbrie Farm
SHPO INFORMATION FOR THIS PROPERTY			
<b>NR date listed:</b>	02/15/1977	106 Project(s)	
<b>ILS survey date:</b>		<b>SHPO Case</b>	<b>Date</b>
<b>RLS survey date:</b>			<b>Agency Effect Eval</b>
<b>Gen file date:</b>			
ARCHITECTURAL / PROPERTY DESCRIPTION			
<i>(Includes expanded description of the building/property, setting, significant landscape features, outbuildings and alterations)</i>			
<p>Architectural Description: The property consists of a house, octagonal barn, grainery and orchards. The frame house was built c.1866 in the manner popularized by Calvert Vaux's architectural design book <i>Villas and Cottages</i>. It is a typical two-story Italian Villa with attic and cellar. It's dimensions, excluding porches, are 25' x 42'. The rooms are arranged semiformaly around a stair hall. The center three bays of the main façade are projected under a gable. The main story includes a living room, formal hall, family room, dining room, pantry, kitchen and bath. The upstairs is composed of three bedrooms, each with an adjoining room. There is a formal stairway leading upstairs from the front hall and another stairway from the pantry. The front porch is 10' x 16'. It has a parapet, and its members are simple and squared, compared to the finishing of the cornice, doors, window framements, etc. The railing is crudely nailed to the façade. Access to the roof of the porch is given by a door aligned with the entry in the upper story. The back porch is about eight feet square. A garage is attached to the rear of the house by a causeway roof. Of the foundation, a thirty-inch ground course of brick is exposed. It is faced with stucco laid in a rectangular pattern and articulated by expansion joints. The exterior trim is in keeping with the keynote of the Italian Villa mode, namely the allusion to Renaissance detailing. All corners are decorated with staggered quoining of wood. Under the cornice is a deep, molded entablature, and decorated brackets. At the time the exterior was covered with composition siding, care was taken to replace the quoins. The window framements consist of lintels, brackets, and kneed frames. The double hung sash holds two lights each. There is a shallow, one-foot vestibule with molded paneling preceding the main entry. Old hinges remaining indicate that there was once an outer door or screening of some sort. The front door is divided, in the French manner, pierced by two tall lights with rounded arch heads, and decorated with elaborate molded panels. The interior trim consists of wainscoting of tongue-in-groove battens and chair rail. The family room chimney piece has been restyled in the Craftsman tradition with Roman bricks and mantle piece supported by plain modillions. The grainery was built c. 1855 and is a simple four-sided building with interior sections divided for grain storage. The basic structure of the building was built entirely with hand-hewn timbers, which were notched and pegged together providing strong support. The exterior is composed of batten siding. The octagonal barn was built in 1913, as the original log barn was removed to make way for the Orenco spur of the Oregon Electric Railway track. The entire barn is made of cedar. There is neither a silo nor a central post in the barn. The uncluttered central haymow is made possible by a superb roof of radiating rafters. On the ground floor there are cattle stalls as an extension of the floor of mow. The second floor, which looks down over the central haymow, was also meant to store loose hay. Site and Environment: The grounds, at once disciplined and romantic, are laid out in accordance with the principal landscaping aesthetic of the day, that advanced by sometime associates Andrew Jackson Downing and Calvert Vaux. An imposing approach is created by a circular fore-court lined with weeping birches and catalpa. An orchard, including three ancient Chestnut trees, lies to the north, the filbert orchard to the south. Interspersed throughout the grounds are fir trees, walnut, cherry spirea, Japanese maple, hawthorne, Giant Arborvitae, boxwood, Silver maple, Big-Leaf maple, Flowering Quince, Cryptomeria, rhododendrons, firethorn, Oregon grape, Buddelia, holly and laurel. The undercover of perennials and herbaceous plants includes ferns, roses, iris, sweet william, columbine, violets, peonies, etc. In addition to the landscaping around the house, there are two orchards, located on the north and south of the main entrance containing mature filbert and English walnut plantings. There trees are about twenty feet high and provide good shade. Description of Conditions and Alterations: A. House- Excellent condition; altered. Alterations in the house include the following 1. Bathroom and kitchen have been re-modeled, 1971 2. Composition roofing replaces the shakes of 100 years ago, 1975 3. Composition siding covers the original wood, 1954 4. The front porch no longer extends the length of the house, date unknown B. Grainery – Fair condition; altered. In the grainery a concrete floor has been poured and grain bins have been reinforced with wooden divisions and steel crossbars, c. 1948. C. Octagon Barn – Deteriorated condition; slightly altered. The octagon barn is missing the original cupola, otherwise it is unaltered, date unknown.</p>			
HISTORY			
<i>(Chronological, descriptive history of the property from its construction through at least the historic period - preferably to the present)</i>			

Historical significance: The Imbrie Farm complex is one of the finest collections of rural architecture in Oregon. The farm house alone is one of the finest examples of Italian Villa architecture within the state. James and Robert Imbrie were among the earliest permanent settlers in Washington County. Amazingly, the family has maintained ownership of the farm to the present, and they have carefully and thoughtfully maintained all of the buildings. The Imbrie farm has been owned and operated by five generations of the Imbrie family. The first Imbrie to migrate westward was James Imbrie, a second-generation American born citizen whose grandfather participated in the Revolutionary War. He arrived, according to family history, in 1844, and his first claim to Washington County land appeared in the Provisional Government records in May 1847. James Imbrie's role in local history was not distinguished, but he was a successful farmer and stock raiser and a respected member of the Tualatin Plains community. In 1853 he joined with others under the leadership of Simon Reed in agitation for a territorial road which would connect the productive plains to the fast growing shipping outlets north of the Columbia. He also had a part in other political developments in his area, as Territorial Government documents show that he was a signer of a petition to fix the boundary of Champoeg County, signer of a petition for a "Nehalem" County, and a signer of other petitions for miscellaneous domestic affairs. James Imbrie's younger brother, Robert, who was born in Ohio on August 21, 1831 and later lived in Illinois, came to Oregon with his wife and mother in 1859. They took the route around the Isthmus of Panama, the same route his brother James had taken. On their arrival in Oregon they stayed with James and his family while deciding on a location for their home. Robert obtained a Land Grant and purchased a number of other claims from various neighbors until the time of his death he owned about 1,500 acres in Washington County with additional large holdings of land in Eastern Washington. Their first home was a log cabin, but in 1866 they built on the same site of the present home. Family history states that the first room to be completed was the present dining room, in order to be used for the birth of Frank on June 8, 1869. Robert was also very active in the community affairs and at the time of his death on January 5, 1897, the Hillsboro Argus paid him great tribute, stressing his readiness to contribute benevolent purposes and give a helping hand. He was president of the Washington County Agricultural Society and quite active on various committees for the State Fair. He was also one of the original members of the Hillsboro Grange and a member of Tuality Lodge, No. 6, A.F. and A.M. Robert and his wife had twelve children, six of whom were living at the time of his death. The property has stayed in the family line going from Robert to one of his twelve children, Frank. Frank had only one son, James Hay, who then had four sons. James Hay Imbrie's wife, Lillian Berger Imbrie, still lives at the century old home. The architecture of each of the buildings is significant in its own right. The octagon barn, considered an oddity in the Tualatin plains area, was designed and built by Frank Imbrie in 1913. The grainery is a fine example of pioneer construction and techniques as it is entirely hand-hewn cedar timbers which are notched and pegged together. The house is an extraordinary structure for a farm house built during the early period of Oregon statehood. It is of unusual design and was obviously built by a wealthy farmer with some imagination. The site is a well preserved example of a prosperous farm in the Post-Reconstruction Era. The combination of the existing buildings makes this one of the finest examples of late nineteenth century farm complexes in Oregon.

**RESEARCH INFORMATION**

Title Records	Census Records	Property Tax Records	Local Histories
Sanborn Maps	Biographical Sources	SHPO Files	Interviews
Obituaries	Newspapers	State Archives	Historic Photographs
City Directories	Building Permits	State Library	

**Local Library:**

**University Library:**

**Historical Society:**

**Other Respository:**

**Bibliography:**

Sources Consulted: Arthur, Eric and Witney. The Barn: A Vanishing Landmark in North America. Toronto: A&W Visual Library, 1972. 253 pp. Curly, Lottie. Oregon Donation Land Claims. Washington County Historical Library. Imbrie, Boyd V. Geneology of the Imbrie Family of Western Pennsylvania. Pittsburg, 1953. Mooberry, Lester. "Discovery of Log Cabin Homes of Early Pioneers, One of the Highlights of Oregon Centennial Observance", Hillsboro Argus, May 12, 1960. Oregon Department of Parks and Recreation. Area Investigation, Imbrie Farm Historic Site. William K. Riesland, June 13, 1966. Sites, Ann. Barns, Barns, Barns, A Sampling of Vernacular Architecture in the Tualatin Plains Area of Oregon. Unpublished paper. Washington County Historical Society Library, December 31, 1969. Washington County Historical Society. Genealogical Material in Oregon Donation Land Claims, Volume II, abstracted from applications by the Genealogical Forum of Portland, Oregon, 1959. Washington County Historical Society, "Impressions and Observations of the Journal Man", June 2, 1935.

# Oregon Historic Site Form

Five Oaks Site  
 NW Casper Lane, South of NW Jacobsen,  
 Helvetia Road  
 Hillsboro, Washington County

## LOCATION AND PROPERTY NAME

address: NW Casper Lane, South of NW Jacobsen, Helvetia Road  appr. addr

historic name: Five Oaks Site

Hillsboro  vcnt Washington County

current/ other names: \_\_\_\_\_

Optional Information  
 assoc addresses:  
 (former addresses, intersections, etc.)  
 location descr:  
 (remote sites)

block nbr: \_\_\_\_\_ lot nbr: \_\_\_\_\_ tax lot nbr: \_\_\_\_\_  
 township: \_\_\_\_\_ range: \_\_\_\_\_ section: \_\_\_\_\_ 1/4: \_\_\_\_\_  
 zip: \_\_\_\_\_

## PROPERTY CHARACTERISTICS

resource type: site height (# stories): \_\_\_\_\_ total # eligible resources: 1 total # ineligible resources:

elig. evaluation: undetermined NR status: \_\_\_\_\_

primary constr date: \_\_\_\_\_ (c.)  secondary date: \_\_\_\_\_ (c.)   
 (optional--use for major addns) NR date listed: \_\_\_\_\_ (indiv listed only; see Grouping for hist dist)

primary orig use: Natural Feature orig use comments: \_\_\_\_\_

secondary orig use: \_\_\_\_\_ prim style comments: \_\_\_\_\_

primary style: Not Applicable sec style comments: \_\_\_\_\_

secondary style: \_\_\_\_\_ siding comments: \_\_\_\_\_

primary siding: \_\_\_\_\_ architect: \_\_\_\_\_

secondary siding: \_\_\_\_\_ builder: \_\_\_\_\_

plan type: \_\_\_\_\_

comments/notes: Site of historic meeting location; trees planted c. 16

## GROUPINGS / ASSOCIATIONS

survey project name or other grouping name: Hillsboro Local Inventory Update 2008 2008 Survey & Inventory Project

farmstead/cluster name: \_\_\_\_\_ external site #: 113/317  
 (ID# used in city/agency database)

## SHPO INFO FOR THIS PROPERTY

NR date listed: \_\_\_\_\_

ILS survey date: \_\_\_\_\_

RLS survey date: 7/1/2008

Gen File date: \_\_\_\_\_

**106 Project(s)**



# Oregon Historic Site Form

Five Oaks Site  
NW Casper Lane, South of NW Jacobsen,  
Helvetia Road  
Hillsboro, Washington County

## ARCHITECTURAL / PROPERTY DESCRIPTION

(Include expanded description of the building/property, setting, significant landscape features, outbuildings, and alterations)

Contextual Description:

The Five Oaks Meeting Place is located north of Sunset Highway and east of Helvetia Road in a wheat field. The trees, of which only three stand, can be easily viewed by freeway traffic. Another set of five oaks are sited to the south off of Jackson Road.

## HISTORY

(Chronological, descriptive history of the property from its construction through at least the historic period [preferably to the present])

Historical Significance:

The Five Oaks Meeting Place was host to both Indian and early pioneers. The circle of five large Oregon white oak trees was called by the Indians, Cha-ta-kuin, place of big trees, and was used frequently as a camping spot. It is believed that the Tuality District, of which Washington County was a part, was organized in the grove next to the Five Oaks. This spot was referred to as the Five Oaks by Joe Meek and the Mountain Men, organizers of the first American farming community in the west. Estimated to be from four to six hundred years old, these historic trees witnessed many types of gatherings dating back to at least 1830. The Mountain Men and early pioneers in the area used this area as a social center for Fourth of July picnics, religious revivals, horse races and sessions of the County court. It is told that at one of the Fourth of July gatherings over one thousand Indians and two hundred settlers celebrated together. In later years, when Portland became the trading center, Five Oaks continued to be the stopping place for settlers on their way to Portland to do their trading. Two of the five oaks, located on the original A. Zachary Donation Land Claim, were blown down by storms during the late 1940's. Of the three oaks still standing, one is dead. A living testimonial to both Native American and early white settlement activities, the Five Oaks Meeting Place is a significant historic site for Washington County and the State of Oregon.

## RESEARCH INFORMATION

(Check all of the basic sources consulted and cite specific important sources)

- |                                           |                                                |                                               |                                               |
|-------------------------------------------|------------------------------------------------|-----------------------------------------------|-----------------------------------------------|
| <input type="checkbox"/> Title Records    | <input type="checkbox"/> Census Records        | <input type="checkbox"/> Property Tax Records | <input type="checkbox"/> Local Histories      |
| <input type="checkbox"/> Sanborn Maps     | <input type="checkbox"/> Biographical Sources  | <input type="checkbox"/> SHPO Files           | <input type="checkbox"/> Interviews           |
| <input type="checkbox"/> Obituaries       | <input checked="" type="checkbox"/> Newspapers | <input type="checkbox"/> State Archives       | <input type="checkbox"/> Historic Photographs |
| <input type="checkbox"/> City Directories | <input type="checkbox"/> Building Permits      | <input type="checkbox"/> State Library        |                                               |

Local Library: \_\_\_\_\_ University Library: \_\_\_\_\_

Historical Society: \_\_\_\_\_ Other Repository: \_\_\_\_\_

Bibliography: Sources Consulted:

Benson, Robert L., State of Oregon Historic Sites and Building, Washington County.

West Union Centennial 1851-1951. Printed by the Hillsboro Argus, p. 28.

Recorded by: McLaughlin, Emde, and O'Brien, Cole, September 1983.

# Oregon Historic Site Record

LOCATION AND PROPERTY NAME			
<b>address:</b>	NW Casper Ln (approx) Hillsboro, Washington County	<b>historic name:</b>	Five Oaks Meeting Place
<b>assoc addresses:</b>		<b>current/other names:</b>	
<b>location descr:</b>	Sunset Hwy & Helvetia Rd; S of NW Jacobsen, Helvetia Rd	<b>block/lot/tax lot:</b>	
		<b>twshp/rng/sect/qtr sect:</b>	01N 02W 15
PROPERTY CHARACTERISTICS			
<b>resource type:</b>	Site	<b>height (stories):</b>	
<b>elig evaluation:</b>	undetermined	<b>total elig resources:</b>	1
<b>prim constr date:</b>	c.1830	<b>second date:</b>	1940
		<b>total inelig resources:</b>	0
<b>primary orig use:</b>	Natural Feature	<b>NR Status:</b>	
<b>second orig use:</b>	SOCIAL: General	<b>date indiv listed:</b>	
<b>primary style:</b>	Not Applicable	<b>orig use comments:</b>	
<b>secondary style:</b>		<b>prim style comments:</b>	
<b>primary siding:</b>		<b>sec style comments:</b>	
<b>secondary siding:</b>		<b>siding comments:</b>	
<b>plan type:</b>		<b>architect:</b>	
		<b>builder:</b>	
<b>comments/notes:</b>			
grove of trees traditionally used as meeting place; Site of historic meeting location; trees planted c. 1600			
GROUPINGS / ASSOCIATIONS			
<b>Survey/Grouping Included In:</b>	<b>Type of Grouping</b>	<b>Date Listed</b>	<b>Date Compiled</b>
Hillsboro Local Inventory Update 2008	Survey & Inventory Project		2008
<b>Farmstead/Cluster Name:</b>			
SHPO INFORMATION FOR THIS PROPERTY			
<b>NR date listed:</b>		106 Project(s)	
<b>ILS survey date:</b>		<b>SHPO Case</b>	<b>Date</b>
<b>RLS survey date:</b>	07/01/2008		<b>Agency Effect Eval</b>
<b>Gen file date:</b>			
ARCHITECTURAL / PROPERTY DESCRIPTION			
<i>(Includes expanded description of the building/property, setting, significant landscape features, outbuildings and alterations)</i>			
Contextual Description: The Five Oaks Meeting Place is located north of Sunset Highway and east of Helvetia Road in a wheat field. The trees, of which only three stand, can be easily viewed by freeway traffic. Another set of five oaks are sited to the south off of Jackson Road.			
HISTORY			
<i>(Chronological, descriptive history of the property from its construction through at least the historic period - preferably to the present)</i>			
Historical Significance: The Five Oaks Meeting Place was host to both Indian and early pioneers. The circle of five large Oregon white oak trees was called by the Indians, Cha-ta-kuin, place of big trees, and was used frequently as a camping spot. It is believed that the Tuality District, of which Washington County was a part, was organized in the grove next to the Five Oaks. This spot was referred to as the Five Oaks by Joe Meek and the Mountain Men, organizers of the first American farming community in the west. Estimated to be from four to six hundred years old, these historic trees witnessed many types of gatherings dating back to at least 1830. The Mountain Men and early pioneers in the area used this area as a social center for Fourth of July picnics, religious revivals, horse races and sessions of the County court. It is told that at one of the Fourth of July gatherings over one thousand Indians and two hundred settlers celebrated together. In later years, when Portland became the trading center, Five Oaks continued to be the stopping place for settlers on their way to Portland to do their trading. Two of the five oaks, located on the original A. Zachary Donation Land Claim, were blown down by storms during the late 1940's. Of the three oaks still standing, one is dead. A living testimonial to both Native American and early white settlement activities, the Five Oaks Meeting Place is a significant historic site for Washington County and the State of Oregon.			
RESEARCH INFORMATION			
Title Records	Census Records	Property Tax Records	Local Histories
Sanborn Maps	Biographical Sources	SHPO Files	Interviews
Obituaries	✓ Newspapers	State Archives	Historic Photographs
City Directories	Building Permits	State Library	
<b>Local Library:</b>		<b>University Library:</b>	
<b>Historical Society:</b>		<b>Other Respository:</b>	
<b>Bibliography:</b>			
Sources Consulted: Benson, Robert L., State of Orgeon Historic Sites and Building, Washington County. West Union Centennial 1851-1951. Printed by the Hillsboro Argus, p. 28. Recorded by: McLaughlin, Emde, and O'Brien, Cole, September 1983.			

# Oregon Historic Site Record

LOCATION AND PROPERTY NAME			
<b>address:</b>	253rd St Hillsboro, Washington County	<b>historic name:</b>	Methodist Meeting House Site
<b>assoc addresses:</b>		<b>current/other names:</b>	
<b>location descr:</b>		<b>block/lot/tax lot:</b>	
		<b>twnsHP/rng/sect/qtr sect:</b>	01N 02W 21
PROPERTY CHARACTERISTICS			
<b>resource type:</b>	Site	<b>height (stories):</b>	
<b>elig evaluation:</b>	undetermined	<b>total elig resources:</b>	1
<b>prim constr date:</b>	1843	<b>second date:</b>	1844
		<b>total inelig resources:</b>	0
<b>primary orig use:</b>	RELIGION: General	<b>orig use comments:</b>	
<b>second orig use:</b>		<b>prim style comments:</b>	
<b>primary style:</b>	Other / Undefined	<b>sec style comments:</b>	
<b>secondary style:</b>		<b>siding comments:</b>	
<b>primary siding:</b>		<b>architect:</b>	
<b>secondary siding:</b>		<b>builder:</b>	
<b>plan type:</b>			
<b>comments/notes:</b>			
In county			
GROUPINGS / ASSOCIATIONS			
<b>Survey/Grouping Included In:</b>	<b>Type of Grouping</b>	<b>Date Listed</b>	<b>Date Compiled</b>
Hillsboro Local Inventory Update 2008	Survey & Inventory Project		2008
<b>Farmstead/Cluster Name:</b>			
<b>SHPO INFORMATION FOR THIS PROPERTY</b>			
<b>NR date listed:</b>		106 Project(s)	
<b>ILS survey date:</b>		<b>SHPO Case</b>	<b>Date</b>
<b>RLS survey date:</b>		<b>Agency Effect Eval</b>	
<b>Gen file date:</b>			
ARCHITECTURAL / PROPERTY DESCRIPTION			
<i>(Includes expanded description of the building/property, setting, significant landscape features, outbuildings and alterations)</i>			
Contextual Description: The site of the Methodist Meeting House is in the Tualatin Plains, five miles Northeast of Hillsboro. It was located east of 253rd Avenue, across from the Shute residence on the Richard Constable Donation Land Claim. A thick grove of fir trees and berry bushes are north of the field.			
HISTORY			
<i>(Chronological, descriptive history of the property from its construction through at least the historic period - preferably to the present)</i>			
Historical Significance: The Methodist Meeting House was the forerunner of the Hillsboro Methodist Church. The Meeting House was constructed in 1844 by Reverend Joseph Hosgry, on the Richard Constable Farm. There is no evidence that the church members had legal rights to this property, as no deed was issued. The building resembled an early day church; it had a belfry but no bell. It is said that the church members could not afford to buy a bell. Prior to the construction of the Meeting House, camp meetings were held outdoors on this site. Jason Lee preached his first sermon here on Sunday, July 12, 1843, with a congregation of 16 people. A week later, 60 people came here for the meeting, which was followed by services in the home of Richard Constable. Constable later helped organize and build the Meeting House. Rev. James Cave preached at the Meeting House until 1860, when Rev. C. C. Hosford took over. The Meeting House was used by other denominations and for other purposes besides church services. The Baptists conducted services in the building from 1845-1852. During the early days of the Territorial and Provisional Governments, court sessions were held at the Meeting House. By 1865, a site had both been purchased in Hillsboro for a new church by a group of trustees. This site was sold shortly thereafter, and a new site for the church was purchased on what is now the corner of 3rd and Washington Streets. People stopped attending the Meeting House, and the church was abandoned in 1865. It was dismantled at this time by William O. Gibson and James Gibson, and the timber was hauled to Hillsboro for reconstruction of the new church. This church was started, but was not completed until 1872. It did have a bell, brought from Portland, for the belfry. It is said that there was an Indian uprising near the Methodist Meeting House in 1855. Because the church was the largest building at that time in the Plains area, church members built a stockade around the church to defend their families in case of an attack. After the Indian threat subsided, the fence was removed. The site of the Methodist Meeting House is significant in its association with the religious activities of early Washington County pioneers. The actual siting of the Methodist Meeting House is unclear, although it is reputed to be in the general area of the Constable DLC. It is a very important settlement area in HGA 4.			
RESEARCH INFORMATION			
Title Records	Census Records	Property Tax Records	Local Histories
Sanborn Maps	Biographical Sources	SHPO Files	Interviews
Obituaries	✓ Newspapers	State Archives	Historic Photographs
City Directories	Building Permits	State Library	
<b>Local Library:</b>		<b>University Library:</b>	
<b>Historical Society:</b>		<b>Other Respository:</b>	
<b>Bibliography:</b>			
Sources Consulted: Washington County Museum, Vertical Files: Methodist Churches: Lester C. Mooberry. "The Methodist Church", 1859. pp. 1-7. Nixon, Birgetta, Ed. Hillsboro Argus-Bicentennial Edition, Washington County, 1976. P. 108.			

# Oregon Historic Site Record

LOCATION AND PROPERTY NAME			
<b>address:</b>	Evergreen & Sewell Rds Hillsboro, Washington County	<b>historic name:</b>	Sewell Clay Works
<b>assoc addresses:</b>		<b>current/other names:</b>	North Pacific Clay Works
<b>location descr:</b>		<b>block/lot/tax lot:</b>	
		<b>twnsHP/rng/sect/qtr sect:</b>	01N 02W 20
PROPERTY CHARACTERISTICS			
<b>resource type:</b>	Site	<b>height (stories):</b>	
<b>elig evaluation:</b>	undetermined	<b>total elig resources:</b>	1
<b>prim constr date:</b>	1880	<b>NR Status:</b>	
		<b>date indiv listed:</b>	
<b>primary orig use:</b>	Processing Site	<b>orig use comments:</b>	
<b>second orig use:</b>		<b>prim style comments:</b>	
<b>primary style:</b>	Not Applicable	<b>sec style comments:</b>	
<b>secondary style:</b>		<b>siding comments:</b>	
<b>primary siding:</b>		<b>architect:</b>	
<b>secondary siding:</b>		<b>builder:</b>	
<b>plan type:</b>			
<b>comments/notes:</b>			
CR-E			
GROUPINGS / ASSOCIATIONS			
<b>Survey/Grouping Included In:</b>	<b>Type of Grouping</b>	<b>Date Listed</b>	<b>Date Compiled</b>
Hillsboro Local Inventory Update 2008	Survey & Inventory Project		2008
<b>Farmstead/Cluster Name:</b>			
<b>SHPO INFORMATION FOR THIS PROPERTY</b>			
<b>NR date listed:</b>		106 Project(s)	
<b>ILS survey date:</b>		<b>SHPO Case</b>	<b>Date</b>
<b>RLS survey date:</b>	07/01/2008	<b>Agency Effect Eval</b>	
<b>Gen file date:</b>			
ARCHITECTURAL / PROPERTY DESCRIPTION			
<i>(Includes expanded description of the building/property, setting, significant landscape features, outbuildings and alterations)</i>			
Contextual Description: The site at the southeast corner of Sewell and Evergreen Roads is the location of James H. Sewell's North Pacific Clay Works, often referred to simply as the Sewell Clay Works. A grove of oak trees surround the site.			
HISTORY			
<i>(Chronological, descriptive history of the property from its construction through at least the historic period - preferably to the present)</i>			
Historical Significance: James H. Sewell was born May 24, 1847, the son of English-born immigrants, Henry Sewell and Mary Ann Garrish, pioneers of the 1843 and 1844 immigrations, respectively. James H. was raised on the 526 acre Sewell Donation Land Claim but left to work in Eastern Oregon. He returned in 1870, at the age of 23, upon death of his father, to manage the family farm. He did so successfully, building up the family holdings to 740 acres, engaging in general farming as well as horse and cattle raising. The origins of Sewell's Clay Works were not a deliberate business venture but rather were based on Sewell's need for a large quantity of drainage tile for the family farm. It is interesting to note that the soil conditions of the central Tualatin Valley that required extensive drainage of farmlands, i.e., a high water table and heavy clay content, included in part a solution to the problem of drainage: clay for drainage tiles. Sewell found that he possessed a significant amount of high quality clay on his own farm. The record is unclear exactly when Sewell began the limited manufacture of drainage tile for his own need, but we do know his original equipment costs were approximately \$30.00 for a second hand tile mill. Sewell's tile producing efforts were quantities of good drainage tile from the high quality clay on his farm, he ordered the best available technology from the east and began manufacturing drainage tile on a large scale. As of 1893, the North Pacific Clay Works was reported to be the largest such industry in the state and served a national clientele. The record indicates that Sewell was also considering expanding into brick manufacturing at his clay works, but it is not clear if he ever actually did so. It is interesting to note that Sewell was not alone in the clay works industry. There was another tile factory in the Tualatin area (see site #145/516) and at least two brick yards that we know of, those operated by Joe Adams at the site of the present Shute Park and at 5th and Oak Streets in Hillsboro, in the 1880's. James H. Sewell died on February 11, 1913. His estate was left to his two children, and the record is unclear as to whether or not North Pacific Clay Works was still in operation at that time. In any event, it would seem safe to state that the North Pacific Clay Works has a 15-20 year span of existence at least, and provided a great deal of drainage tile for the agricultural needs of the central Tualatin Valley. It is an outstanding example of the successful agricultural business of the late 19th century founded on the original Donation Land Claim farms of the first American overland pioneers of the 1840's in HGA			
RESEARCH INFORMATION			
Title Records	Census Records	Property Tax Records	Local Histories
Sanborn Maps	Biographical Sources	SHPO Files	Interviews
✓ Obituaries	Newspapers	State Archives	Historic Photographs
City Directories	Building Permits	State Library	
<b>Local Library:</b>		<b>University Library:</b>	
<b>Historical Society:</b>		<b>Other Respository:</b>	
<b>Bibliography:</b>			
Sources Consulted: Nixon, Birgetta. Hillsboro Argus-Centennial Edition. 1976. Hillsboro Independent. Sewell Obituary, February 28, 1913. Hines, Rev. H. K. An Illustrated History of the State of Oregon. Chicago: Lewis Publishing Co., 1893, p. 935.			