Helvetia
concept plan

Prepared for:
The City of Hillsboro

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Helvetia Concept Plan Project Team

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I. Background

A. Helvetia Concept Plan History

In 2002, the Metro Council added the 249-acre Helvetia Concept Planning Area (Figure I-1 and Figure I-2) to the Region's Urban Growth Boundary (UGB) to help provide a 20-year industrial land supply within the Portland Region as required by State law.[1] The Helvetia area is currently in unincorporated Washington County. The Helvetia Concept plan is the fulfillment of an agreement between the City of Hillsboro and Washington County that the City would prepare the industrial area concept plan for future employment growth in the Helvetia planning area. Concept plans are required when lands are added to the UGB to ensure that the transition over time from rural to urban uses occurs efficiently and consistent with the identified land needs that justified their inclusion.

B. Helvetia Concept Planning Process

The City hired a team of land use planning, transportation, natural resources, real estate and economic development consultants in January 2007 to assist with the development of an Industrial Development Concept Plan for Helvetia. These professionals, in addition to key management staff from the City, became the Project Management Team and were responsible for the coordination and technical analysis necessary to compile the Helvetia Concept Plan. Planning for the 534-acre Evergreen Concept Planning Area, which came into the UGB in 2005, was undertaken by the Project Management Team at the same time, in a parallel planning process.

1. Project Goals and Objectives

One of the first tasks of the Project Management Team was to develop a set of Concept Plan goals to guide the project. The Goals and Objectives listed below were used to develop and evaluate the Conceptual Illustrations (as discussed in Chapter IV of the Concept Plan) and future implementation measures.

Goal 1: Create Area-wide Economic Opportunities and Value

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[1] See Appendix B., Metro Ordinance No. 04-1040B.

- Address state and regional directives for adequate and available industrial sites, while accommodating community and Area stakeholders development concerns;
- Develop and carry out a strategy to strengthen and diversify the local industrial economic base and sustainable employment opportunities; and
- Formulate and adopt flexible industrial site development management guidelines for the Area capable of adjusting to shifting market opportunities and constraints.

Goal 2: Integrate Area Industrial Uses with Hillsboro Industrial Sanctuary

- Identify Area industrial development phasing strategy and steps that reflect market opportunities and constraints and Area stakeholders concerns;
- Integrate management of Area natural resources and environmental features into industrial development sites; and
- Coordinate Area industrial uses and development with surrounding industrial uses and activities.

Goal 3: Provide Adequate Supporting Industrial Development Infrastructure

- Determine and describe Area infrastructure (sewer, water, roads, utilities, etc) capacity requirements needed to adequately support the development of prescribed industrial uses and concepts for the Area;
- Identify infrastructure phasing steps to implement the Helvetia Concept Plan in a manner that reflects market and financing opportunities;
- Identify equitable financing methods to promote the orderly and economic provision of public services and private utilities; and
- Explore Area-wide public and private development financing tools that capture and apply, as needed, increased Area land values to help finance the construction of public infrastructure needed to support planned Area industrial uses and concepts.

Goal 4: Promote Community Awareness and Stakeholder Involvement

- Recognize and respect the varied characteristics and levels of stakeholder support and readiness for industrial development;

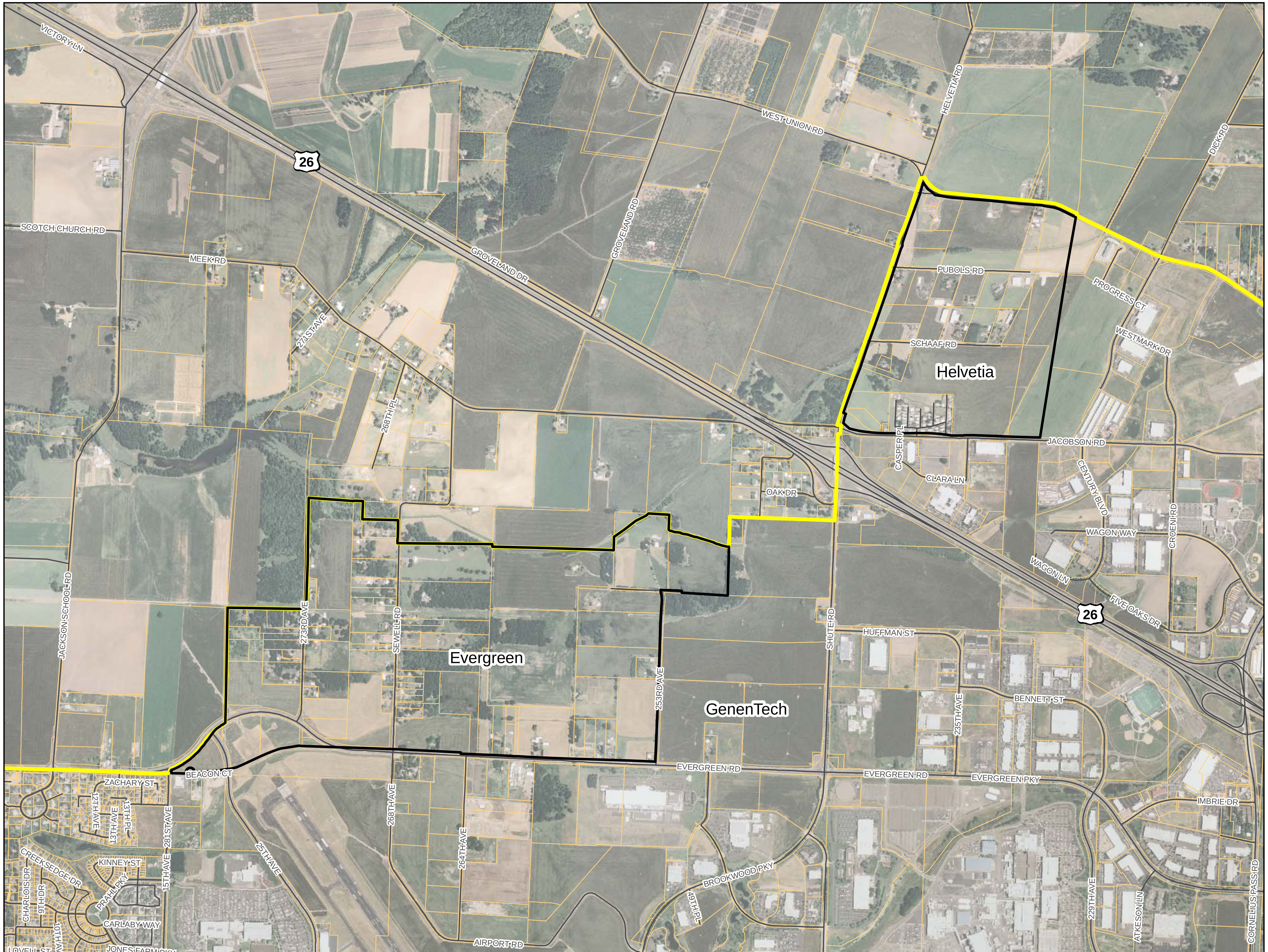
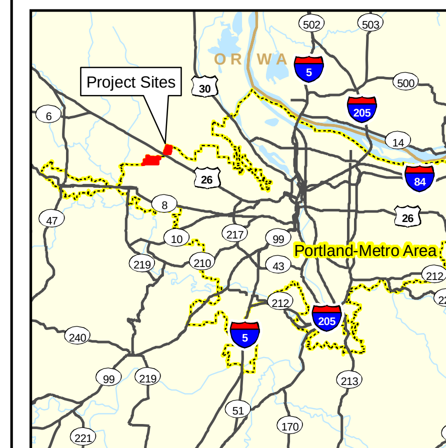


Figure I.1

Project Vicinity

Evergreen/Helvetia UGB Concept Plans



LEGEND

- Project Sites
- UGB
- Roads
- Tax Lots

N

0 1,500 3,000
Feet

Angelo planning group

CH2MHILL

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Figure I.2

Helvetia Concept Planning Area

Evergreen/Helvetia UGB Concept Plans

LEGEND

- Helvetia Site (Planning Area = 242.12 ac)
- UGB
- Roads
- Tax Lots

N

0 500 1,000
Feet

Angelo planning group

CH2MHILL

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- Offer meaningful opportunities for participation and involvement of stakeholders and property owners in shaping the development options and implementation steps;
- Establish a clear understanding of industrial development steps and implementation actions such as zoning and annexation; and
- Identify opportunities for partnerships between property owners, the development community and the City.

2. Project Approach

The project approach for the Helvetia Concept Plan included compiling information on existing conditions in the study area to create a "baseline" for future planning, engaging in a public involvement strategy that actively involved property owners and interested citizens, and soliciting advice from economic development, real estate, and regulatory, land use, and transportation specialists. To this end, the project was informed by Economic Trends Workshop panelists (see Chapter III., Helvetia Concept Plan Development Program), a Technical Advisory Committee, a Project Development Panel, and the Helvetia Stakeholders Advisory Group (HSAG) which was comprised of property owners within the Helvetia planning area and some additional interested parties.

The following is a summary of the objectives and expected outcomes of the Helvetia Concept Plan planning process:

- Compliance with Metro's Concept Planning requirements and the conditions that the Metro Council placed on the area;
- Recommendation for industrial land uses and design concepts that demonstrate how the area can develop in an efficient manner;
- Identification of public facility and infrastructure needed to support industrial development;
- Participation and involvement of stakeholders and property owners in shaping the development and design concepts and implementation steps;
- Demonstration of market feasibility, strengths, opportunities, conditions and requirements to achieve the industrial development concepts; and

- Completion of implementation steps including comprehensive plan and zoning ordinances, annexation strategies and management plans and tools.

The ultimate goal of the project was to develop one or more Industrial Conceptual Illustrations (see Chapter IV. Helvetia Industrial Area Concept Plan) and develop a comprehensive Concept Plan that would serve as a road map for future development in Helvetia. Implementation of the Concept Plan will be carried out through the City's adoption of policy changes to the Comprehensive Plan and amendments to the Development Code to include the Helvetia Special Industrial District (see Chapter V., Implementation Steps).

3. Technical Advisory Committee

The Helvetia Concept Plan's Technical Advisory Committee (TAC) was comprised of representatives from the Department of Land Conservation and Development (DLCD), Oregon Department of Transportation (ODOT), Washington County Planning Division, Port of Portland, and the City's Engineering and Planning Departments. Members acted as technical advisors for the project, as well as liaisons to policy makers within their agencies. The TAC met three times during the course of the project and provided technical and policy information that assisted in the refinement of the Industrial Urban Growth Diagrams (see Chapter IV. of the Concept Plan).

4. Stakeholder and Community Involvement

Shortly after the kick-off in January 2007 of the Helvetia Concept Plan project, a survey was sent to all property owners in the study area. Answers to the survey questions indicated how long residents had resided or owned property in the area, their knowledge about the Helvetia area being brought into the UGB, and the current use of their land. Most important to the planning process, survey responses also indicated suggestions to guide growth in the area.

At the start of the project, the Project Management Team decided to involve property owners more directly with the planning process by assembling them into a stakeholders' advisory group. Helvetia Stakeholders Advisory Group (HSAG) membership was open to the 22 property owners within the study area. Four HSAG meetings were held over the course of the project; one of these meetings was held in conjunction with a project open house. HSAG meeting attendance ranged from 9 to 16 attendees. HSAG members reviewed and provided feedback on key findings and conclusions of the planning process, including survey results, existing conditions in the study area, and proposed industrial urban growth concepts. In the final HSAG meeting, members discussed refinements to the growth concepts and proposed comprehensive plan policy and development code amendments that would implement the Helvetia Concept Plan.

One open house was held to present information related to the concept planning project and to solicit feedback from a wider public. Participants at the open house were primarily planning area property owners, neighboring property owners, and members of Citizen Planning Organization (CPO) #8. A newsletter was developed to inform the public about the planning process and to invite people to attend first open house. This newsletter was distributed to the HSAG, property owners in the Evergreen area, and neighboring properties. The open house was held principally to discuss existing conditions within the study area and to solicit issues for the project team to consider as it prepared the Concept Plan. The last HSAG meeting was also open to interested members of the public and focused in detail on the Industrial Urban Growth Concepts (see Chapter IV. of the Concept Plan) and the proposed policy and land use regulatory language that implements the Concept Plan.

The HSAG and other interested members of the public were also kept informed through a project website (www.evergreen-helvetia.org) where information and products related to the Helvetia planning process were posted. Additionally, an informational meeting was held for the residents of Country Haven manufactured home community early in the process. Thirty-two residents attended. Appendix C contains a complete summary of community outreach activities associated with the Helvetia concept planning. Appendix D contains the materials used at HSAG meetings.

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II. Existing Conditions

A solid and comprehensive understanding of the existing conditions in the Helvetia area provided the foundation for the development of the Concept Plan. An analysis of existing physical, policy, and economic characteristics that define the area and an identification of issues relevant to the area was the subject of the Existing Conditions Report (Appendix A). The summary of the site conditions for the Helvetia area included in this section is based on information in the Existing Conditions Report.

The Helvetia area is in unincorporated Washington County and is zoned Future Development 20 Acre (FD-20). Ultimately, in order for industrial development to occur in Helvetia, properties will need to annex to the City of Hillsboro and be zoned for urban industrial uses (See Chapter V., Implementation Steps, in the Concept Plan).

A. Area Characteristics

The Helvetia planning area is located to the northeast of downtown Hillsboro. It encompasses 249 acres and lies northeast of the Highway 26 Shute Road interchange, east of NE Helvetia Road. West Union Road forms the northern boundary of the study area and NW Jacobson Road is the southern most boundary. NW Schaaf Road and NW Pubols Road are the two main east-west roads.

The Helvetia planning area is characterized by relatively flat land, historically used for farming. The topography is gently sloping to rolling, ranging from approximately 255 feet elevation in the eastern portion of the planning area to approximately 185 feet at the Waible Creek flooplain in the west. Areas along Helvetia in the northern portion of the study area contain mapped wetlands and areas of fish and wildlife habitat associated with tributaries of Waible Creek and the McKay Creek watershed (see Natural Resources section in this report).

Existing development in the Helvetia planning area is primarily associated with farm practices, with the notable exception of a mobile home park (Country Haven) located off of NW Jacobson Road. There is also a commercial building located in the corner of the site, at the intersection of West union Road and NW Helvetia Road. Bonneville Power Administration power lines run through the western part of the site.

Agricultural land surrounds the Helvetia planning area to the west and north. Light industrial uses lie to the east and south. Notable businesses in the area include Credence Systems Corporation, between Sunset Highway and NW Jacobson Road, and Convergys Corporation, south of Sunset Highway.

B. Transportation Network

Future growth in the Helvetia area will have impacts on the transportation network in the area. A list of the roadways that serve the Helvetia area, which jurisdiction is responsible for them, their classification and the current average daily vehicular trips they carry is included in Table III-1 below.

Table III-1: Existing Roadway Jurisdiction, Functional Classification and Characteristics[2]

Roadway	Jurisdiction	Motor Vehicle Functional Class			Approximate ADT
		ODOT	Washington County	City of Hillsboro	
Hwy 26 west of Shute Rd	ODOT	Rural Principal Arterial	Freeway	Freeway	40,800
Hwy 26 east of Shute Rd	ODOT	Urban Principal Arterial – Freeway	Freeway	Freeway	56,300
West Union Rd	County	N/A	Arterial	Arterial	3,970
Evergreen Rd	County	N/A	Arterial	Arterial	12,770
Evergreen Pkwy	County	N/A	Arterial	Arterial	12,920
Helvetia Rd	County	N/A	Arterial	Arterial	5,080
Shute Rd	County	N/A	Arterial	Arterial	30,600
Cornelius Pass Rd	County	N/A	Arterial	Arterial	27,410
Jacobson Rd	City	N/A	Collector	Collector	3,840
Huffman St	City	N/A	Collector	Collector	1,350
Meek Rd	County	N/A	Collector	N/A	340
NW 229th Ave	City	N/A	Collector	Collector	10,380
Century Blvd	City	N/A	Collector	Collector	N/D

Notes: ADT obtained from published ODOT, Washington County, and City of Hillsboro data.
N/A = Not Applicable
N/D = No Data Available

[2] Two existing County roadways within the study area that not included in this table are NW 273rd Avenue and NW 253rd Avenue.

Analysis included as part of the Existing Conditions Report (Appendix A) provided a review of existing transportation conditions for the Helvetia study area that was used to establish a baseline for the evaluation of the impact of the proposed industrial development. Several intersections in the City of Hillsboro and Washington County that will be utilized by future employment users in the area were evaluated. At each location, traffic data was gathered and analyzed to evaluate current conditions and performance for all modes of travel. Additional data was collected for other aspects of the transportation system including built facilities, as described by Metro GIS data, and reported traffic volumes on state and county facilities. The Transportation chapter of the Existing Conditions Report describes the characteristics, usage, and performance of the study intersections.

All of the study intersections currently operate within the performance standards during the PM peak hour.[3] The greatest delay at an unsignalized intersection is experienced at NW Helvetia Road/Jacobson Road where over 180 vehicles make a westbound left turn during the evening peak hour.

Truck (heavy vehicle) volumes were collected as part of the intersection turn movement counts and were used in motor vehicle operations calculations. Of the eight study intersections, the three nearest to the Helvetia Concept Plan site experience the lowest truck volumes.

The assessment of pedestrian facilities found that narrow sidewalks exist along many of the study area roadways with gaps occurring mostly where there are vacant properties or properties outside the city limits of Hillsboro. For bicyclists, bike lanes are provided on many of the arterial roadways within the city limits of Hillsboro. There are no bike lanes provided outside city limits or adjacent to the Helvetia Concept Plan area. Pedestrian and bicycle volumes at the study intersections were counted during the PM peak periods. The peak hour volumes indicate that there is relatively more bicycle demand at study intersections than pedestrian usage. The most activity was at the Cornelius Pass Road/Jacobson Road intersection, where 7 bicyclists (traveling north-south) and 9

[3] The PM peak hour intersection volumes were used to determine the existing study intersection operating conditions based on the 2000 Highway Capacity Manual methodology for signalized and unsignalized intersections.

pedestrians (5 traveling north-south; 4 traveling east-west) were counted during the PM peak.

Transit service is provided in the study area by the Tri County Metropolitan Transportation District of Oregon (TriMet), which provides transit service for the Portland Metro area including the counties of Clackamas, Multnomah and Washington. Route 47 travels along Baseline Road, NW 229th Avenue, and Evergreen Parkway, connecting the Hillsboro Transit Center to the Willow Creek/SW 185th Ave Transit Center.

C. Utilities

Currently, utilities in Helvetia are commensurate with the agricultural and rural residential land uses in the area. A more detailed description of the existing utilities available in Helvetia can be found in Chapter V. of the Existing Conditions Report (Appendix A). A summary of available utilities is found below.

1. Public Utilities

Clean Water Services (CWS) is the public utility responsible for providing wastewater and stormwater services in the Tualatin River Watershed. The primary regulatory driver for sanitary sewer is Clean Water Services and their Design and Construction Standards. These standards regulate the design, conveyance, and installation of sanitary sewer within the Washington County UGB. There is a pump station discharging to a 4-inch force main in the southern area of the Helvetia planning area. The pump station is located within the NW Helvetia Road planning area and serves a small subdivision directly north of NW Jacobson Road. The force main extends a distance of 900 feet in NW Jacobsen Road and connects to the Sunset trunk approximately 1,925 feet south of the planning area via a 12-inch gravity pipe. No sanitary sewer service mains have been identified along NW Jacobson Road to the south, NW Helvetia Road to the west, or West Union Road to the north. The existing sanitary sewer will not be available or have the capacity to serve future industrial development in the Helvetia concept planning area.

Clean Water Services also manages the conveyance, detention and water quality treatment of stormwater with the Washington County UGB. There is currently no stormwater conveyance system within the Helvetia concept planning area with the exception of a discharge from the Jacobson Road stormwater system to the southern drainage swale in the planning area. A 12-inch diameter storm system currently serves the south side NW Jacobson Road discharges to Wiable Creek at Jacobson and Helvetia Road. The north side of Jacobson Road is not curbed and is served by a roadside drainage ditch. NW Helvetia Road, along the west side of the planning area, is served by roadside ditches that discharge in to Wiable Creek. West Union Road along the north side of the planning area is also served by roadside ditches draining into Wiable Creek or its tributary.

The Helvetia development site is located adjacent to the service area of the Tualatin Valley Water District (TVWD). There is currently a water distribution network adjacent to the east and south sides of the Helvetia concept planning area. The existing 24-inch service main along NW Jacobson Road to the south would most likely be used to serve development in the Helvetia area. There are no identified water distribution service mains along Helvetia to the west or West Union Road to the north. However, the 12-inch existing service main located along West Union Road that terminates east of the Helvetia Planning Area may be extended to serve the area from the north. This line could then be extended south along NW Helvetia Road and connected to the 24-inch main along NW Jacobson Road to provide a looped system to service the area from all sides.

2. Private Utilities

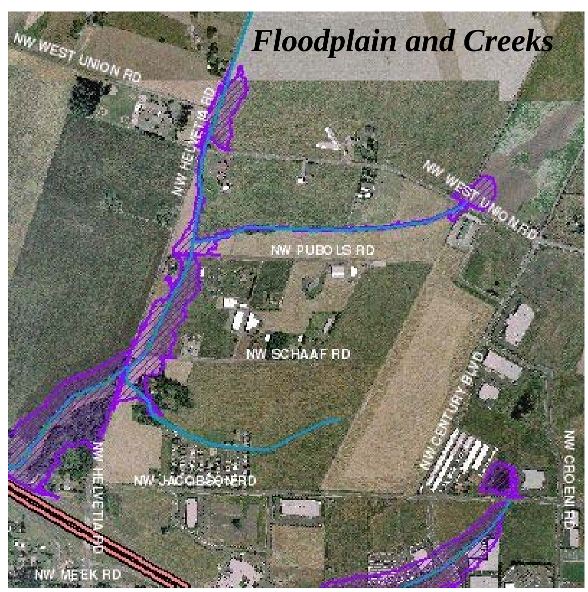
Private utility providers to the Helvetia area include Portland General Electric (PGE), NW Natural Gas, Bonneville Power Administration, and Qwest and Verizon (telephone).

Electric power is supplied to the planning area by Portland General Electric (PGE). PGE's Sunset Reliability Center is a power substation designed and built to meet the requirements of several semiconductor fabrication facilities in the area, including Intel's Ronler Acres site, and other high tech customers in the vicinity. The power substation is located at 235th and Evergreen. PGE is also planning to build a technology enhanced substation on approximately 10 acres within the Evergreen concept planning area. This substation will be configured in a manner similar to PGE's existing Sunset substation.[4]

D. Natural Resources

Natural features and environmental constraints identified in the 249-acre Helvetia planning area include riparian corridors, wetlands, groundwater resources, and natural areas. Defining the natural landscape in the Helvetia area is the Lower McKay Creek streamshed.
Two tributaries to Waible Creek, a tributary of McKay Creek., cross the planning area; both tributaries flow directly to Waible Creek at the western edge of the planning area. The topography of the site is gently sloping to rolling, ranging from about 255 feet elevation in the eastern portion of the planning area to about 185 feet at the Waible Creek floodplain to the west.

The Helvetia area is flat to gently sloping and populated primarily with hydrologic group C and D soils. These soils have relatively low rates of infiltration and high runoff potential, particularly when wet. Average annual precipitation is on the order of 40-inches per year, with the majority of precipitation falling during the winter months.



The major stream in the Helvetia area is Waible Creek, a tributary of McKay Creek. Waible Creek runs north to south near the east side of Helvetia Road, crossing under Helvetia Road near the south end of the planning area. It is mapped on the preliminary (September 28, 2007) Flood Insurance Rate Maps (FIRM) as a Special Flood Hazard Area (SFHA) and designated as a Special Flood Hazard Area (SFHA) and designated as Zone AE in the preliminary Flood Insurance Study. A SFHA is defined as the area that will be inundated by the flood event having a 1-percent

[4] April 19, 2007 Memo from PGE System Planning Department regarding Evergreen UGB Expansion Area Vision.

chance of being equaled or exceeded in any given year. The 1-percent annual chance flood is also referred to as the "base flood". Within areas designated Zone AE, purchase of mandatory flood insurance is required by FEMA.

There are two tributaries to Waible Creek in the planning area. Both drainages flow from east to west, one along the north side of the planning area, north of Pubols Road and the other along the south side, south of Schaaf Road. Portions of the northern tributary are mapped on the preliminary FIRM as a SFHA and designated as Zone AE, and portions of northern tributary are designated as Zone X, which are areas of moderate flood hazard having a 2-percent annual chance flood. Flood insurance is available but not required in areas designated Zone X. As shown on the FIRM, only a small section of the southern tributary near its confluence with Waible Creek is mapped as a SFHA and designated Zone AE. On the north and south sides of the Zone AE designation, the FIRM indicates areas of moderate flood hazard which are designated Zone X.

E. Cultural Resources

The Helvetia concept planning area is part of the original D. T. Lennox Donation Land Claim (DLC)(General Land Office 1862). Lennox was born in 1802 in Catskill, New York and settled his claim in Washington County in 1844. A review of abstracts from applications for Donation Land Claims shows Lennox to have been a prominent and active member of the community (Genealogical Forum of Portland 1957).

Two notable landmarks are present on lands adjacent to the Helvetia site: West Union Baptist Church and the Five Oaks Meeting Place.

West Union Baptist Church and Cemetery. Constructed in 1844 on land donated by D.T. Lennox, the church is notable for being the first Baptist Church west of the Rocky Mountains. The church is located in the northwest quadrant of the intersection of West Union Road and Dick Road. The church is listed on the National Register of Historic Places. D. T. Lennox is buried in the adjacent church cemetery.


West Union Baptist Church

Five Oaks Meeting Place. This location, originally the site of five large Oregon White Oaks, is located on the Alexander Zachary DLC (General Land Office 1862). It is a locally significant historic site known as a meeting place for local historic figure Joseph Meek and other early mountain men and settlers. Parades, picnics, religious meetings horse races and sessions of the County Court were all held at this location as late as the early 1900s. Two of the original five oaks remain on the site. The site is located just south of the Helvetia Parcel off of Casper Place and is marked by an informational kiosk.


Five Oaks Meeting Place

III. Helvetia Concept Plan Development Program

A. Summary of Economic Trends Workshop

On Monday February 26, 2007, the City of Hillsboro hosted an Economic Trends Workshop at the Hillsboro Civic Center Auditorium that served as the "kick-off" to the Evergreen and Helvetia Concept Plans. The Workshop consisted of three panels and a roundtable forum, where experts from the Portland metro region and around the country discussed economic and industry trends from both a local and national perspective. The workshop was intended to inform the upcoming concept planning of the Evergreen and Helvetia Industrial Areas through the exploration of economic trends and emerging industry clusters in Washington County. Panelists discussed issues related to workforce, flexibility in site planning, target industries, and regional collaboration. A full summary of the Economic Trends Workshop is included in Appendix E.

B. Economic Characteristics of the Area

In order to assess the area's development potential, a detailed analysis of ownership and development patterns was performed at the beginning of the concept planning process. This work is included in the Existing Conditions Report (Appendix A). There are __ landowners in the Helvetia Area. An estimated 37 percent (89 acres) of property in the study area is vacant. Forty-six percent (109 acres) of property is improved, primarily with single-family residences and farm structures. The development potential of 40 acres of undeveloped property along the eastern edge of the Area's boundary within the Bonneville Power Administration's easement is severely limited and is not classified as vacant.

While most existing development occupies only a limited portion of each parcel, a 15-acre property on the southern edge of Helvetia's boundary is more intensively developed as a mobile home park. Approximately 25 percent of improved properties in the Helvetia Area are small- to medium-size lots less than 10 acres with limited development, while 12 percent are larger lots of 10 acres or more with limited development. An estimated 105 acres (44 percent) of property in the Helvetia Area is owned by four property owners with 10 or more acres of land.

Existing demographics also provide an indication of future development types in the area. The Economic Characteristics chapter of the Existing Conditions Report summarizes population, employment, income, and educational attainment. One of the conclusions from this data research is that there is an available, well-educated workforce in Hillsboro and Washington County, which makes these places a desirable location for high-tech employers that require a high degree of education, specialized training and management experience.

Hillsboro's industrial economy is fueled by companies such as Intel and Sun Microsystems that specialize in computer and electronic product manufacturing (NAICS 334). In addition to several large, high-tech manufacturing employers, major healthcare facilities and customer service call centers also are located in Hillsboro. The majority of existing industrial users on the Westside are within the high-tech cluster. Recent investments by companies such as Genentech and SolarWorld have increased interest and speculation with regard to the City's potential to attract biosciences and sustainable industries firms. Local real estate and economic development experts generally agree that the Evergreen and Helvetia Areas are most likely to accommodate growth in the high-tech and semiconductor industries and sustainable industries.

C. Development Program

A development program – a narrative and quantitative description of how a property or area could be developed – was developed for both Helvetia and Evergreen to serve as a guide for the development of the respective Concept Plans. The development program (Appendix F) describes an overall identity for the project areas, including how the properties will be best positioned. The overall objective is to prepare concept plans that offer the opportunity to capture target markets, maintain economically viable conditions, and strengthen prospects for financial success while addressing Metro's and Hillsboro's goals for job creation and place making.

The development program for Helvetia responds to a series of "Big Ideas" that describe the general type of development that the community desires and that is likely to be achieved. Serving as objectives for the planning effort, these Big Ideas become benchmarks against which concept alternatives can be evaluated. The Big Ideas that will drive employment growth in Hillsboro, and Helvetia in particular, are described below:

Category	Users	Land/Building
Industry of Today (what we've already got)	Silicon (Intel, solar, display panels)	Large campuses (200 acres, 100 acres, etc.)
Industry of Tomorrow (what Hillsboro is beginning to see)	Medical, pharma, bio (Genentech, OHSU), sustainable energy	Medium campuses (75 acres)
Industry of the Future (what Hillsboro could get someday)	Medical (biochips, merging of industries of today/tomorrow)	Office/flex/R&D space, medium to large single-user campuses
Other components		
Services to support all three paradigms	Software companies, suppliers	Leased space in industrial parks or 10-20 acre single-user sites
Commercial service center	Hotel, bank, food	5-10 acres

The ability for Helvetia to actually capture the above industries is driven by Hillsboro's strengths, such as having a pool of skilled workers in the technology and silicon industries, relatively cheap and reliable power, and a proximity to similar types of industries.

The development program includes a variety of assumptions about market opportunities, and implementation. These assumptions include a program development planning horizon of year 2030 and an expectation that more distribution and lower intensity employment will take place at Helvetia, as compared to likely campus development and associated higher-density office employment in Evergreen. A complete list of these assumptions is found in Appendix F.

1. Development Types

The program (Appendix F) for Helvetia includes combinations of development types and typical parcel sizes. The following development types were explored as possible future land users in the Helvetia and Evergreen area:

Sustainable Environmental and Energy Businesses (50 to 100+ acres): These sites provide locations for major corporate and manufacturing campuses for global companies in the sustainable, environmental, and energy industries. The variety of sizes allows for a range of product development (vertically integrated) as well as supporting corporate office and R&D functions. Potential industries could include those related to solar and silicon manufacturing, wind energy, high technology, and biotechnology.

Biotech Campus (35 to 50+ acres): A biotech campus would provide a medium-sized parcel for a business that would be directly related to Hillsboro's emerging biotech industry. Industry Suppliers (10 to 20+ acres): Industry supplier parcels provide sites for businesses that provide materials and services in support of the larger industrial users in Evergreen and elsewhere in Hillsboro. These could include both manufacturers as well as distributors of products that are used in the manufacture of products at other companies. Potential users could include suppliers of test equipment, uniforms and linens, lab supplies, sub-components and circuit boards, and packaging materials.

Industrial Incubators, Start-ups, and Spin-offs Business Parks (12 to 40 acres): These sites would be developed by commercial developers and leased in multi-tenant business and industrial parks. Leased park space is needed for smaller and emerging companies that do not have the capital or desire to be owners or for those that are in a growth mode and want the flexibility to move in the future. Industrial business parks typically have a unifying brand and image, which is controlled by a set of CC&Rs. Some industrial business parks may have a focus on raw industrial space, while others may be more focused on flex buildings that combine office and industrial space. Based on interviews with developers, sites of between 20 and 40 acres are preferred.

Industry Research and Development (R&D) Parks (20 to 30 acres): Similar to the above, industry R&D parks provide flexible development space (either as a single user or multi-tenant) for supporting businesses and spin-offs from Hillsboro's core and emerging technology industries.

Distribution Businesses (10 to 70 acres): Helvetia's location near Highway 26 may make it attractive to warehouse/distribution businesses that have a focus on Washington County. Distributors that have a wider focus will likely choose sites along I-5 instead. Any distributor parcels in Helvetia could easily be reclassified as supplier or developer parcels since the parcel size is the same.

These development types were the basis for the industrial use categories listed in the proposed Helvetia Road Area Special Industrial District (HSID) in the Hillsboro Development Code (see Appendix L).

2. Program for the Alternative Concept

Helvetia has relatively few options for internal traffic circulation, thus the greatest variable in formulating a development program for the area was the size of parcels. Since the circulation will be relatively fixed, and parcel lines can be moved relatively easily, only a single concept plan was developed for Helvetia. The development program for the Helvetia area provides the opportunity for a range of development sites and smaller campuses to provide space for flex uses and research and development companies. The development program assumes that future land users in Helvetia will have a direct connection to the large campus users in the surrounding area, and those expected in Evergreen in the future. In addition, Helvetia is expected to accommodate distribution businesses, industries that require good access to the transportation network, via Highway 26, in order to deliver goods throughout the region.

A unique development program has been prepared that corresponds to the Conceptual Illustration for the Helvetia Concept Plan (see Chapter IV.) The *Helvetia Development Programs* tables in Appendix F demonstrate the types of users, and the amount of land they would use, under the growth scenario.

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IV. Helvetia Area Concept Plan

A. Industrial Urban Growth Conceptual Illustration

The purpose of this section is to present an illustration of how the Helvetia area may develop in the future. The Industrial Urban Growth Conceptual Illustration ("Conceptual Illustration" or "Concept") was developed for Helvetia reflects the types of users the City of Hillsboro would like to attract to the area, considers the lotting patterns and physical location of the area that will be urbanized with industrial uses, and respects existing natural features. The Conceptual Illustration is not a zoning map but rather is an expression of how the area could develop, consistent with the Concept Plan. The Conceptual Illustration is consistent with the proposed policy and code language that implements the Concept Plan (see Chapter V., Implementation Steps) and the corresponding transportation improvements necessary to support the anticipated industrial development (see Section B, Transportation Plan).

1. Conceptual Illustration A

Conceptual Illustration A was developed in response to a desire to create support industry sites characterized by efficient, flexible site layout opportunities that are effectively served by roadway transportation connections (see Figure IV.1.).

As shown in Conceptual Illustration A, the most visible edges of the site, those with the most direct roadway connections to Route 26, are designated Distribution Businesses and are intended to serve distribution uses. The least visible areas of the site are designated Industrial Business Park and are intended for users that do not depend on public visibility for their business. The plan also provides smaller parcels for each of the two land uses, yet accommodates one parcel exceeding 50 acres. The plan respects the 100-year floodplain to the west and the BPA easement to the east, and neither was encroached upon by the proposed concept.

Increased traffic flow and safety is accommodated by proposing an improved NW Jacobson Road connection to NW Helvetia Road and the opportunity for an improved connection of NW Groveland Drive to NW Helvetia Road at the current NW Schaff Road intersection.

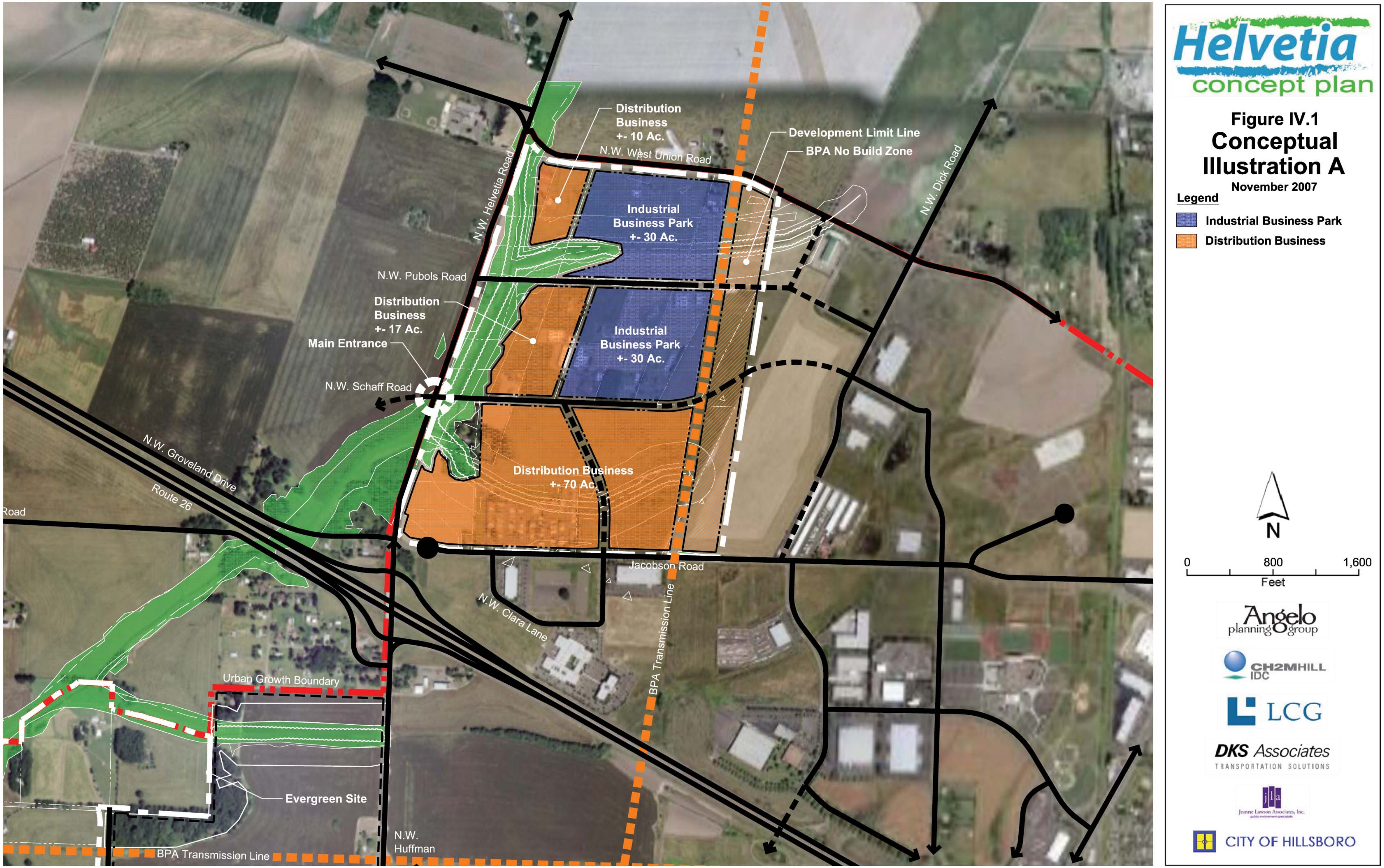
The plan also proposes extending NW Pubols Road and NW Schaff Road to the east to connect with NW Dick Road and NW Union Road, thus providing a street grid with multiple choices for vehicles traveling to and from the site.

B. Transportation Plan

This section provides an overview of the future transportation conditions within the Helvetia Concept Plan area, both without additional development in the Helvetia planning area and with full development of the Helvetia planning area consistent with the Conceptual Illustrations. Listed in this section are improvements to the transportation network that will be needed to mitigate traffic levels anticipated from development in Helvetia. Also listed are improvements and associated costs needed to onsite collector roads and fronting arterial streets.

1. 2030 Future Conditions

In order to determine what impacts future industrial development in the Helvetia planning area would have on the transportation system, twenty-one study intersections were analyzed without the addition of Helvetia project traffic for the 2030 PM peak hour to determine the transportation system improvements that would be required if buildout of the Concept Plan did not occur. Seventeen of the study intersections would require mitigation in order to meet performance standards. The following table identifies those 17 intersections that will require improvements to meet performance standards without the addition of any development in the Helvetia planning area (see Appendix G, Transportation Forecasting Documentation for full transportation analysis).



Helvetia
concept plan
Figure IV.1
Conceptual Illustration A
November 2007
Legend
Industrial Business Park
Distribution Business
N
0
800
1,600
Feet
Angelo planning group
CH2MHILL IDC
LCG
DKS Associates
TRANSPORTATION SOLUTIONS
CITY OF HILLSBORO
Distribution Business +- 10 Ac.
N.W. West Union Road
Development Limit Line
BPA No Build Zone
Industrial Business Park +- 30 Ac.
N.W. Helvetia Road
N.W. Dick Road
N.W. Pubols Road
Distribution Business +- 17 Ac.
Main Entrance
Industrial Business Park +- 30 Ac.
N.W. Schaff Road
Distribution Business +- 70 Ac.
N.W. Groveland Drive
Route 26
Road
Jacobson Road
N.W. Clara Lane
BPA Transmission Line
Urban Growth Boundary
Evergreen Site
N.W. Huffman
BPA Transmission Line

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Table IV-1: Transportation Mitigations for 2030 No Build Conditions (Without Concept Plans)

	Location	Improvement Item	Planned Project?
1	NW Glencoe Rd/ NW Evergreen Rd	Add a northbound right turn lane	NEW
		Add a northbound right turn overlap	NEW
		Add second westbound left turn lane	NEW
		Add additional southbound receiving lane on Glencoe south of intersection to Milne for dual westbound left turn	NEW
2	NE Jackson School Rd/ NW Evergreen Rd	Add a northbound right turn overlap phase	NEW
3	Evergreen Road	Widen to 5 lane section from NE 253rd-Glencoe *(TSP project)*	Hillsboro TSP
4	New East-West Carrying Capacity	New roadway (or expanded existing roadway) to relieve traffic on Evergreen at Shute Road and Cornelius Pass (*Needs to be considered in TSP update)*	NEW
5	NW Shute Rd/ NW Evergreen Pkwy	Add northbound right turn overlap phase	NEW
6	NW 229th Ave/ NW Evergreen Rd	Add a northbound right turn overlap phase	NEW
		Add a southbound right turn lane	Hillsboro TSP
		Add second northbound right turn lane	NEW
7	NW Jackson School Rd/ NW Meek Rd	Add a single lane roundabout	NEW
8	NW Jackson School Rd/ Hwy 26 WB Ramp	Add a traffic signal	NEW
		Add a second westbound left turn lane	NEW
		Add a second southbound receiving lane on Jackson School south of the intersection	NEW
9	NW Cornelius Pass Rd/ NW Evergreen Pkwy	Add an eastbound right turn lane	Hillsboro TSP
		Add a northbound right turn lane	
		Add second northbound left turn lane	Hillsboro TSP
		Add second southbound left turn lane	Hillsboro TSP
		Add second westbound left turn lane	Hillsboro TSP
		Add westbound right turn lane	Hillsboro TSP
		Add second westbound right turn and overlap	NEW
10	NW Helvetia Rd/ NW Jacobson Rd	Add a traffic signal	NEW
		Add a northbound right turn lane	NEW

	Location	Improvement Item	Planned Project?
11	NW Shute Rd/ Hwy 26 WB Ramp	Add a single lane roundabout	Draft RTP
		Widen structure over Hwy 26 for additional northbound lane (modification to current RTP project)	NEW
12	NW Shute Rd/ Hwy 26 EB Ramp	Add second northbound through lane	NEW
13	NW Shute Rd/ HW Huffman St	Remove trees in median and install two-way left turn lane.	NEW
		Install traffic signal controls.	*Built by Others*
14	NE Brookwood Pkwy/ NE Cornell Rd	Add second eastbound left turn lane	NEW
		Add second westbound left turn lane	NEW
		Add westbound right turn lane	NEW
		Add southbound through lane	NEW
15	NE Brookwood Pkwy/ W Baseline Rd	Restripe to add second eastbound through lane (five lane section east of intersection as TSP project)	NEW
		Add second southbound through lane	NEW
		Add southbound receiving lane south of intersection	NEW
		Add second westbound left turn lane	NEW
16	NW Jacobson Rd/NW Century Blvd	Add a traffic signal	NEW
		Add northbound right turn lane	NEW
		Add northbound right turn overlap phase	NEW
		Add southbound left turn lane	NEW
17	NW Cornelius Pass Rd/ NW Jacobson Rd	Add second eastbound left turn lane	NEW

The project numbers in Table IV-1 correspond to project locations indicated on Figure IV.2.

Only four study intersections would not require mitigation due to background traffic growth. These improvements would be triggered by other growth in the area without the assumed Concept Plan development. These findings indicate that transportation improvements in the area are needed in addition to what was projected in the Washington County and Hillsboro TSPs. The additional improvements account for traffic growth projected to the year 2030, ten years beyond the 2020 TSP projections.

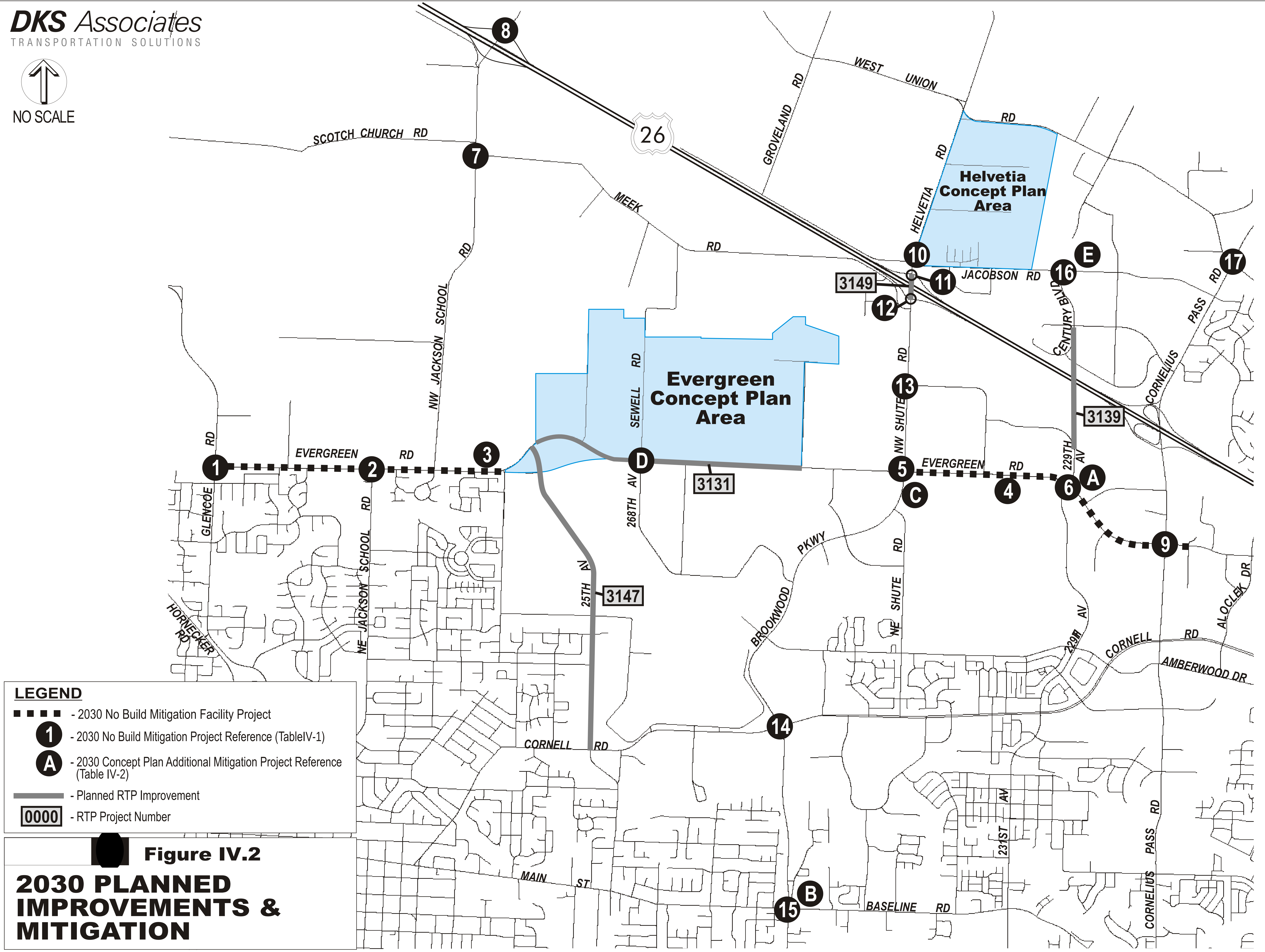

Figure IV.2

2030 PLANNED IMPROVEMENTS & MITIGATION

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Since most of the study intersections would not meet performance standards under the 2030 No Build (e.g. no development in Helvetia) scenario, a number of transportation mitigations would be needed without the adoption of the Evergreen or Helvetia Concept Plans. Most of the mitigations are focused on adding capacity at major intersections. A few would involve substantial expansion to existing roadways, and should be considered as part of the Transportation System Plan update for the city.

2. Recommended Improvements with Development in Helvetia Planning Area

With the addition of industrial development in the Helvetia planning area, one intersection would require additional mitigation with Concept Plan traffic levels in order to meet performance standards in 2030.

The additional mitigation required at this location (assuming mitigation triggered by the No Build scenario is built) in order to meet performance standards is listed in Table IV-2.

Table IV-2: Additional 2030 Transportation Improvements Needed for Helvetia Concept Plan

	Location	Improvement Item	Planning Cost + ROW*
E	NW Jacobson Rd/NW Century Blvd	Add an eastbound right turn lane	$375,000
		TOTAL COST	**$375,000**

*Notes: *Assumes additional 50% to project costs for Right of Way.*

The project letter in Table IV-2 corresponds to project location indicated on Figure IV.2.[5]

[5] Also indicated on Figure IV.4 are project locations A-D. These are intersection mitigation projects on Evergreen Road and NW Brookwood Parkway/W. Baseline Road that are necessary due to development in the Evergreen area. See Appendix G for the full transportation analysis for both the Evergreen and Helvetia planning areas.

3. Site Circulation and Access Improvements

The Helvetia Conceptual Plan Illustration identified new street networks that connect to existing public streets along the frontage. The street improvements associated with the Helvetia Road site were evaluated to determine preliminary engineering cost estimates. Most of these improvements are onsite collector roads, and the half-street improvements to the fronting arterial streets.

The street improvements for the Helvetia Road site include the upgrading of existing NW Schaff Road and NW Pubols Road, and the re-alignment of NW Jacobson Road to connect with Schaff Road east of its intersection with Helvetia Road. All onsite streets would be collector or local level, with the NW Jacobson Road facility planned to serve 3-lanes of traffic (one through lane in each direction, with space for left-turn pockets where appropriate). The NW Pubols Road and NW Schaff Road streets would be industrial class streets built to Washington County industrial standards.

In addition, the fronting street improvements of NW Helvetia Road to a full 5-lane section from the US 26 Ramps to NW Schaff Road, and 3-lanes from that point north to West Union Road would be required. Also, West Union Road would be upgraded to urban standards as a 3-lane arterial facility. The cost estimates include right-of-way onsite, street constructions, and conservative assumptions about project design, administration and construction. The total cost for these improvements is $55 million, including the cost for right-of-way. The NW Helvetia Road and West Union improvements should be eligible for System Development Charge credits, since they are or will be considered as a planned improvement in the Washington County Transportation System Plans. Refer to Appendix G for cost estimate details.

Table IV-3: Helvetia Road Site Street Improvements

Street	Extent	Facility Type	Right-of-Way	Construction Costs	Total Cost
Pubols Road	Helvetia Road to E. Boundary	2-lane Collector	$4,106,520	$6,105,000	$10,211,520
Schaff Road	Helvetia Road to E. Boundary	2-lane Collector	$4,355,400	$6,475,000	$10,830,400
Jacobson Road	Helvetia Road to Clara Lane	3-lane Collector	$3,222,996	$4,273,500	$7,496,496
				$16,853,500	**$28,538,416**

Table IV-4: Helvetia Road Site Frontage Improvements

Street	Extent	Facility Type	Right-of-Way	Construction Costs	Total Cost
Helvetia Road	US 26 Ramps to West Union Road (Schaff Road)	Arterial	$612,000	$3,048,780	$10,818,470
West Union Road	Helvetia Road to plan boundary	Arterial	$0	$8,140,000	$8,140,000
Helvetia Road	Jacobson Road (Schaff Road) to West Union Road	Arterial	$0	$6,715,500	$6,715,500
				$17,904,280	**$25,673,970**

C. Highway 26 / Shute Road Interchange

The Highway 26 / Shute Road interchange has been and will continue to be a major entry point to the large industrial employment base in the northern portion of the City of Hillsboro. The addition of the Evergreen and Helvetia planning areas to the Urban Growth Boundary and the anticipated employment that will be generated in these areas will place greater demand on the Highway 26 / Shute Road Interchange to provide access into this section of the City. The Shute Road Interchange is currently approaching or exceeding the mobility standard identified in the *Oregon Highway Plan* (OHP) for this facility. Of primary concern is the heavy westbound off ramp traffic during the AM peak hour heading southbound and the corresponding northbound to eastbound movement in the PM peak and their effect on traffic operations in the vicinity of the interchange. The Meek Road/Shute Road and Jacobson Road/Groveland Road/Helvetia Road intersection do not meet OHP access spacing standards and have operational concerns due to their proximity to the interchange. A project to address operational and mobility concerns at the interchange, including establishing a westbound to southbound loop ramp, has been identified in the financially constrained *2004 Regional Transportation Plan* (RTP) and has been submitted for inclusion in the financially constrained 2007 RTP by Washington County.

In order to ensure that improvements to the interchange are in place to support industrial development in the Evergreen and Helvetia Concept Plan Areas, the Oregon Department of Transportation, Washington County and the City of Hillsboro will work collaboratively to identify a preferred design for future improvements at the Highway 26 / Shute Road Interchange and attempt to develop a funding strategy (public/private). This work will need to consider the operation of the interchange within the context of the overall transportation system in this section of Hillsboro, including the arterial network that feeds into this and other US 26 interchanges and overcrossings. This joint effort should build upon the results of the transportation evaluation conducted for the Evergreen and Helvetia Concept Plans which identified a series of improvements to the existing transportation network and new transportation facilities necessary to serve future employment growth (see Appendix G).

ODOT, Washington County and Hillsboro will work together to:

- Determine the ultimate configuration of the Highway 26 / Shute Road Interchange;
- Identify incremental improvements to the interchange that can be phased over time;
- Prepare an Interchange Area Management Plan addressing land use strategies for protecting the interchange for its planned function and identifying access spacing and access management requirements;
- Determine the ultimate location for NW Meek Road, NW Jacobson Road and NW Groveland Road as they access NW Shute and NW Helvetia Roads respectively;
- Attempt to develop an implementation strategy for constructing/funding improvements (public/private contributions towards interchange improvements may include developer proportionate share contributions/construction of incremental interchange improvements); and
- Develop and adopt an Interchange Area Management Plan, including any necessary updates to transportation system plans and implementing ordinances.

D. Natural Resources Plan

1. Level of Protection

Consistent with the City's Goal 5 provisions of Section 6, Natural Resources, Open Space, Scenic and Historical Sites, of the Hillsboro Comprehensive Plan, significant wetland and riparian/upland wildlife habitat resources in the Helvetia Area must be protected prior to urbanization. Upon annexation of lands with such resources to the City, these resources will be given an appropriate protection level, as prescribed by Section 131A, Significant Natural Resources Overlay (SNRO) District, of the Hillsboro Zoning Ordinance. The City is currently undertaking an inventory and will determine which of the inventoried resources are significant. For the significant resources, the City will conduct an ESSE analysis and will determine the level of protection. Once annexed, the City will add these resources to the mapped areas protected under the SNRO District.

In addition, some natural resource areas within Helvetia may be considered Habitat Benefit Areas, as defined by the adopted Tualatin Basin Fish & Wildlife Habitat Program. A key element of this program is the encouragement of the use of habitat Friendly Development practices, including Low Impact-Development (LID) techniques, designed to reduce the environmental impacts of new development and remove barriers to their utilization. The intent is to provide flexibility in the land development ordinances to encourage the protection of qualified Habitat Benefit Areas. Habitat-Friendly development techniques, design, and construction practices are included in Section 131B, Habitat Friendly Development, of the Hillsboro Zoning Ordinance.

E. Public Facilities and Services Plan

1. Sewer

Appendix H, Draft Sanitary Sewer Trunk Concept Design Helvetia Road Planning Area, provides a complete overview of the existing sanitary services in the planning area, the challenges in sewering the area, and the proposed method of providing future sanitary service. The Helvetia area lies in Washington County, outside and adjacent to the current Clean Water Services (CWS) service area. The area will be brought into both the City's and

CWS's service area. The planning area is relatively steeply sloped. Wiable Creek, a tributary of McKay Creek, runs north to south along the east side of NW Helvetia Road. Creek crossings by the sanitary system, particularly the crossing of NW Pubols Road across Wiable Creek, presents some challenges.

There is one proposed alternative for planning a sanitary collection system to accommodate future growth in Helvetia (see Figure IV-3). The low point in the planning area is in the southwest corner near the intersection of NW Helvetia Road and NW Jacobsen Road. This area is also lower than the areas to the south of the planning area, making gravity discharge a non-viable option. The proposed sewering plan is to use gravity lines in NW Pubols Road and NW Schaaf Road to convey flows to a gravity mainline in NW Helvetia Road. A new pump station will be placed near the intersection of Helvetia Road and Jacobsen Road. The existing pump station should be taken off line and connected to the new pump station by gravity.

Planning level cost estimates are given in Table IV-5. The cost estimate for the conceptual alternative is based on best professional judgment. Total program cost includes engineering fees equal to 30% of the construction cost. These are costs for main lines only and do not include minor collectors or laterals.

Table IV-5: Sewer Conceptual Construction and Program Costs
(based on I&I of 1,650 gpad)

Alternative	Total Construction Cost ($)	Total Program Cost ($)
Alternative 1	$2,500,000	$3,300,000

Figure IV.3
Helvetia Concept Planning Area Sanitary Sewer System Conceptual Alternative
Evergreen/Helvetia UGB Concept Plans

LEGEND

- Gravity Pipe
- Force Main
- Helvetia Site (Planning Area = 242.12 ac)
- Roads
- Tax Lots

N

0 500 1,000
Feet

Angelo planning group

CH2MHILL

\\ASTORIA\GISDATA1\DATA\PROJ\CITYOFHILLSBORO\EVERGREEN_HELVETIA_UGB_CONCEPTS\GIS\MAPDOCUMENTS\CONCEPTS\FIGURE1_HELVETIA_CONCEPT_SANITARY_SEWER.MXD 9/12/2007 14:53:06

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2. Storm

Appendix I, Draft Stormwater Concept Design Helvetia Road Planning Area, reviews the regulatory standards applicable to managing stormwater from future industrial development in Helvetia. Future development will need to meet Clean Water Services (CWS) for conveyance, water quality and detention. If a nexus exists between project permitting within Helvetia and the Federal Endangered Species Act, the project will be also subject to National Marine Fisheries Service (NMFS) consultation and their stormwater management guidelines.

Water quality treatment options are contained in Chapter 4 of CWS's Design and Construction Standards. Low Impact Development (LID) options are specifically addressed in §4.07 of CWS's Design and Construction Standards. Among the acceptable LID options for private systems are: pervious paving, Eco-Roofs/Roof Gardens; Infiltration Planters; Flow through Planters; Sand Filters; and Tree boxes. Acceptable LID options for public systems also include: Street Swales; Vegetated Filter Strips; and Vegetated Infiltration Basins. For any developments less than one acre, if at least 75-percent of the post development impervious area is treated with LID options no additional stormwater management may be required by CWS.

Discharge of piped or overland conveyance should for to Wiable Creek or to the Jacobson Road storm sewer system. It is unclear what the capacity of the Jacobson Road storm sewer system is; therefore, a downstream analysis must be performed on the system to determine permissible discharge rates. Outfalls to Wiable Creek should be designed in compliance with §5.07.7 of CWS's Design and Construction Standards. They should be above mean low water level and use energy dissipation. These outfalls may also trigger Clean Water Act permit issues

3. Water

The average water demand for the approximately 239 acre Helvetia site is estimated to be approximately 5,500 Gallons per day (GPD)/Acre, assuming that the area will be developed primarily with general industry and commercial industry. This results in a total water system average demand of approximately 1.31 Million Gallons per Day (MGD). The peaking factor for this use is estimated to be 1.5 considering there could be irrigation demands in the summer months. This results in a peak water demand of 1.97 MGD.

The Helvetia development site is located adjacent to the service area of the Tualatin Valley Water District (TVWD). TVWD has indicated that the additional 1 to 2 MGD of average and peak demand could be provided to the Helvetia site without the need of any additional public water infrastructure improvements. TVWD currently has a 24-inch water transmission main located along NW Jacobsen Road adjacent to the southern boundary of the Helvetia site. TVWD has indicated that the development could connect to this 24-inch transmission main and extend the private water infrastructure within the site to adequately supply the needed water for general industry applications.

The primary water system infrastructure improvements required for the Helvetia development site are illustrated in Figure IV.4. The improvements primarily consist of water transmission pipeline and two interconnections and 1 metering station with the TVWD 24 inch water transmission main located along NW Jacobson Road. The concept design illustrated in Figure IV.4 illustrates the extension of new water transmission from the Jacobsen Road 24-inch transmission main through the Helvetia site, to an additional intertie with the 18-inch TVWD transmission pipeline located in West Union Road, this will provide the site water supply system redundancy and looping characteristics for the site water supply system. There are two swale/creek crossings that are required for construction of this transmission system.

See Appendix J, Helvetia Water System Concept Planning, for a complete analysis of estimated water demands, water supply sources, private water infrastructure improvements and estimated costs for developing the needed water infrastructure for industrial development in Helvetia.

Figure IV.4

Helvetia Site Water Infrastructure Improvement

Evergreen/Helvetia UGB Concept Plans

LEGEND

- Concept Water Main
- Existing Water Main
- Helvetia Site (Planning Area = 242.12 ac)
- Roads
- Tax Lots

N

0 500 1,000

Feet

Angelo planning group

CH2MHILL

File Path: S:\data\Proj\CityofHillsboro\Evergreen_Helvetia_UGB_Concepts\GIS\MapDocuments\Existing_Utilities\Figure1_Helvetia_project_Vicinity.mxd, Date: September 7, 2007 11:37:02 AM

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The estimated construction costs for developing the primary water infrastructure for the Helvetia development is approximately $1.13 M, a detailed breakdown of the cost estimate is presented in Table IV-6, this estimate is considered an Order of Magnitude estimate with an accuracy of +30%/-50%. In addition to capital improvement costs, the development will incur System Development Charges (SDCs) from TVWD for enabling the water district to provide the water supply for the Helvetia site. The SDCs are based on the water usage for the development. Based on an average flow rate of 1.31 MGD and peak flow rate of 1.97 MGD, the total SDCs for this development are estimated to be $8.7 M. The TVWD SDC calculation worksheet is provided in Attachment A of Appendix J.

Table IV-6: Helvetia Development Water Infrastructure Improvements Order of Magnitude Comparative Construction Cost Estimates

		Materials		Labor				
Item Description	**Quantity**	**Unit**	**Total**	**Unit**	**Total**	**Unit Price**	**Line Total**	**Costing Assumptions**
General Conditions	$130,300							
General Conditions	1 LS	$38,700	$38,700	$48,200	$48,200	$86,900	$86,900	Allow 10% of Total Contract Amount
Bonds/Insurance	1 LS	7,700	7,700	9,600	9,600	17,300	17,300	Allow 2% of Total Contract Amount
Mobilization/Demobilization/Site Facilities	1 LS	11,600	11,600	14,500	14,500	26,100	26,100	Allow 3% of Total Contract Amount
Earthwork	$739,000							
Pipe Installed Thru Open Farmland--12" di	4,000 LF	40.00	160,000	60.00	240,000	100.00	400,000	Means 06 BCCD 02510 730 2100
Pipe Installed Along County Road--12" dia	2,500 LF	50.00	125,000	60.00	150,000	110.00	275,000	Means 06 BCCD 02510 730 2100
Valved Branches in Main Line	4 EA	2,500	10,000	1,500	6,000	4,000	16,000	Allowance
Valves in Main Line	2 EA	2,000	4,000	1,000	2,000	3,000	6,000	Allowance
Swale Crossings	2 EA	5,000	10,000	5,000	10,000	10,000	20,000	Allowance
Connection and 8 inch meter to Exstg Serv	2 EA	10,000	20,000	1,000	2,000	11,000	22,000	Allowance
Subtotal Estimated Construction Cost of Helvetia Water Infrastructure Improvements							$869,300	
+ Contingency @ 30%							260,700	
Total Estimated Construction Cost of Helvetia Water Infrastructure Improvements							**$1,130,000**	

The cost estimates shown have been prepared for guidance in project evaluation and implementation from the information available at the time of the estimate. The final costs of the project will depend on actual labor and material costs, competitive market conditions, final project scope, implementation schedule and other variable factors. As a result, the final project costs will vary from the estimates presented herein. Because of this, project feasibility and funding needs must be carefully reviewed prior to making specific financial decisions to help ensure proper project evaluation and adequate funding.

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V. Implementation Steps

The Helvetia planning area lies outside of the City of Hillsboro's city limits and is not currently subject to the city's zoning ordinance. Land within the Helvetia area can not urbanize without first being brought into the city limits; upon annexation, parcels within the Helvetia area will be given a city plan designation and urban zoning. In order to implement the Helvetia Concept Plan, the City will need to adopt new Comprehensive Plan policies and Development Code language that addresses future development. It is the recommendation of the Concept Plan that the City adopt a new zone for the Helvetia planning area: the Helvetia Road Special Industrial District (HSID).

A. Comprehensive Plan Amendments

1. Helvetia Area Industrial Plan

The Comprehensive Plan designation to be applied to land within the Helvetia area upon annexation to the City is Industrial (see Figure V.1). A new Comprehensive Plan section, Helvetia Area Industrial Plan, has been drafted to capture the vision for future development in this area, consistent with the Helvetia Concept Plan (see Appendix K). As paraphrased below, policies in this new section include:

- Develop adopt and apply performance-based policy and code measures to guide the development of industrial uses, properties and projects within the Area, while allowing sufficient flexibility and authority to enable the City to respond to changing industrial market trends and opportunities for the Area over time.
- Provide development opportunities within the Helvetia Area for industry uses that fall within any of the preferred industry categories, as specified in the Helvetia Area Development Program, including:
    - High technology sector and related companies and businesses
    - Sustainable industries sector and related businesses and companies
    - Bio-technology, bio-medical, bio-pharmaceutical sector and related businesses and companies

- Businesses and companies that are incubators, start-ups, spin-offs and research and development firms associated with main industrial sectors
- Industry suppliers and distribution businesses

- Where feasible accommodate large industrial sites (parcels 50 – 100 or more acres in size) for large-scale industrial campuses and development projects
- Facilitate the development of smaller, diversified industrial uses and sites (20 – 50 acres in size) - especially smaller-scaled flex-space industrial business parks - that support the main industry sectors encouraged by this Plan.
- Use the land use categories specified in the Helvetia Area Development Program and the Helvetia Conceptual Illustration “A”, (shown in Figure IV.1,) to guide new industrial development within the Area.
- Provide for aesthetically attractive, well designed industrial uses and sites within every development approved for construction in the Helvetia Industrial Area.
- Develop and apply a Helvetia Road Area Special Industrial District Ordinance that substantially complies with the Metro Urban Growth Boundary (UGB) Conditions of Approval and the Urban Growth Management Functional Plan.

Implementation measures in the new policy section presuppose the development of a Helvetia Special Industrial District (HSID) that includes regulations to govern future development in Helvetia (see subsection B, below). Approval of proposed land uses and development activities within the Helvetia will be based on whether or not the proposed use or activity is consistent with the land use categories in the HSID and if the proposal generally achieves the preferred Helvetia Conceptual Illustration A.

Figure V.1
Helvetia
Comprehensive
Plan Designation

Legend

Industrial

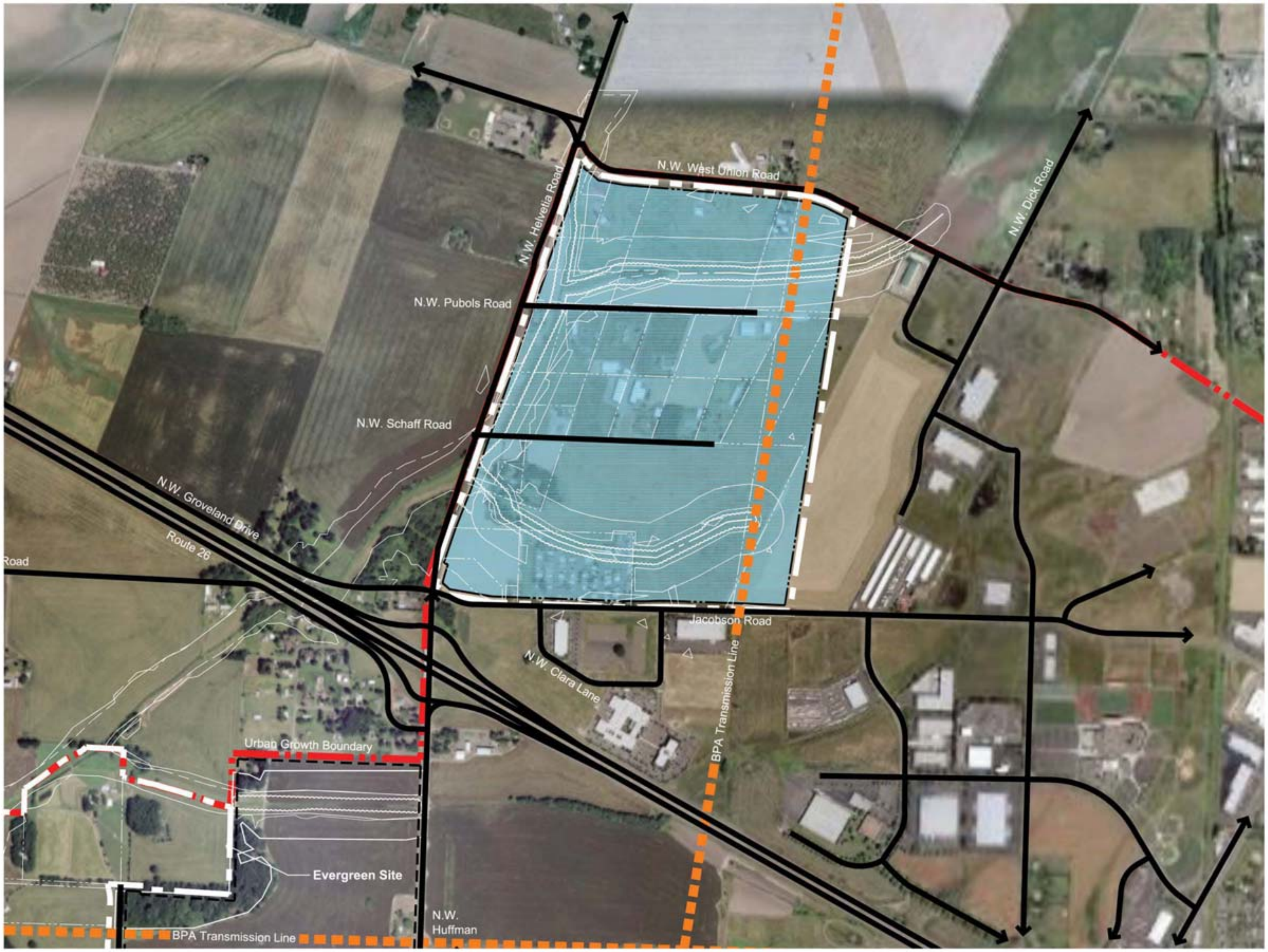

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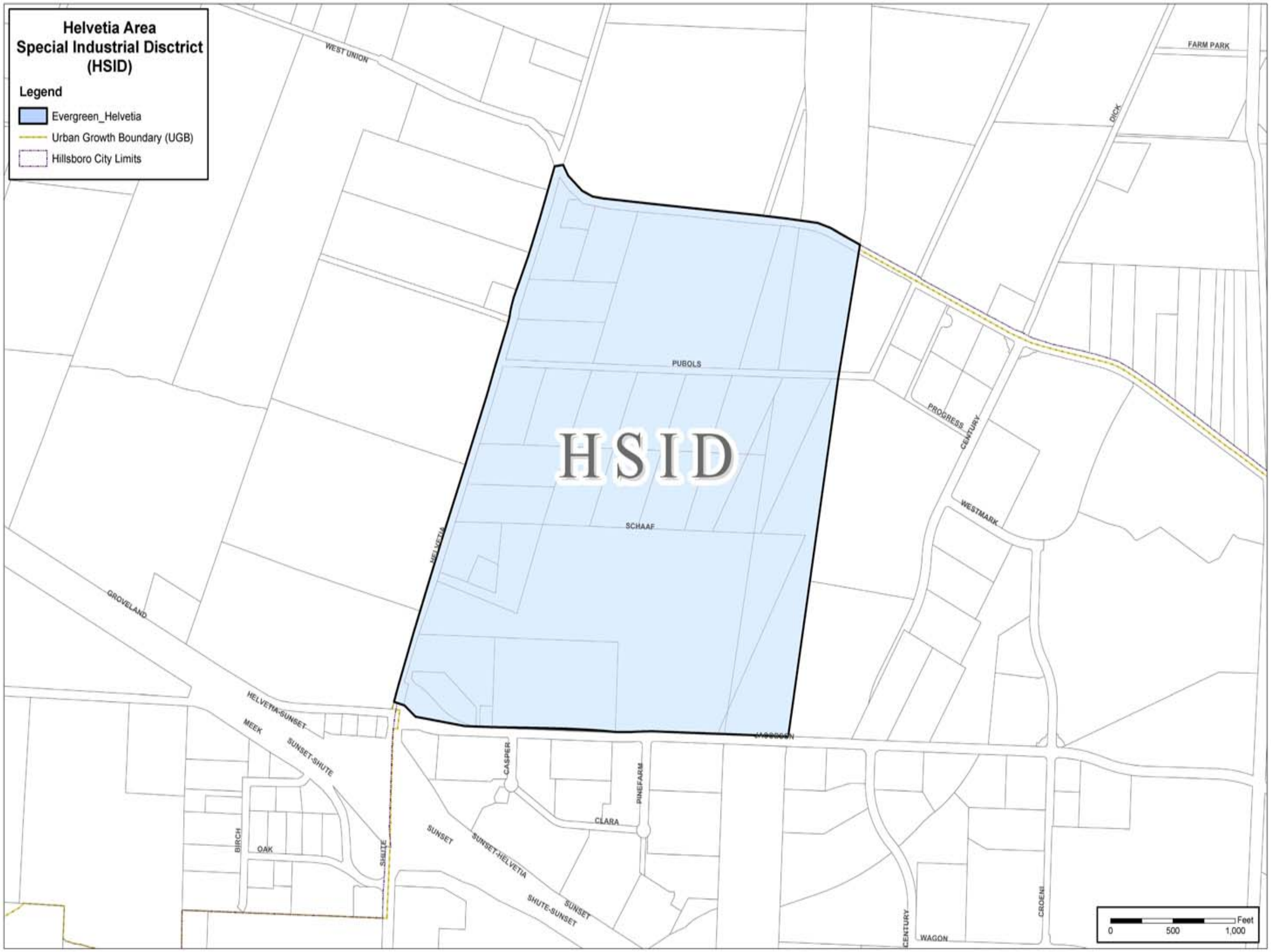
Figure V.2


Helvetia Area
Special Industrial Disctrict
(HSID)
Legend
Evergreen_Helvetia
Urban Growth Boundary (UGB)
Hillsboro City Limits
HSID
WEST UNION
FARM PARK
DICK
PUBOLS
PROGRESS
CENTURY
WESTMARK
SCHAAF
HELVETIA
GROVELAND
HELVETIA-SUNSET
MEEK
SUNSET-SHUTE
CASPER
PINEFARM
CLARA
BIRCH
OAK
SHUTE
SUNSET
SUNSET-HELVETIA
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The Comprehensive Plan amendments incorporate an Area Natural Resources Management Plan, Area Public Infrastructure (Water/Sewer Systems) Management Plan, and e Area Transportation System Plan, the elements of which have been discussed earlier in this document.

B. Zoning Code Amendments

In order to implement the Comprehensive Plan policies for the Helvetia Area Industrial Plan, the city must amend the Development Code and revise the City's zoning map to include the Helvetia Special Industrial District (HSID) zone.

1. Helvetia Special Industrial District (HSID)

The Helvetia Special Industrial District (HSID) is a proposed new zoning district to implement the Helvetia Concept Plan (see Figure V.2). Consistent with proposed comprehensive plan policy in the (new) Helvetia Area Industrial Plan section, the HSID code section contains regulatory language to guide future development in Helvetia (see Appendix L).

The HSID allows all of the uses detailed in the Development Program, including Sustainable Energy and Environmental Businesses and Biotech Campuses. However, based on the Helvetia Conceptual Illustration, it is assumed that this area will develop with distribution businesses and Industry Research and Development (R&D) Parks. Some commercial is allowed in the HSID, but this is restricted to commercial and professional services uses that primarily serve the needs of the workers within the Helvetia and immediately adjacent industrial areas and is limited in size.[6]

Also noteworthy in the proposed code language, the minimum lot size in the HSID is 10 acres. Lots larger than 10 acres in size may subdivide as long as the resulting land division creates one lot or parcel of at least 10 acres and the remaining lot(s) created contains at least one parcel of 5 acres of contiguous land. This provision is to encourage the retention of

[6] Consistent with Metro's Title IV, buildings for these retail uses and professional services may not occupy more than 3,000 square feet of sales or service area in a single outlet, or multiple outlets that occupy more than 20,000 square feet of sales or service area in a single building or in multiple buildings that are part of the same development project.

larger lots, and lot consolidation, to maintain or create sites attractive to industrial developers. Lots of record that are below the minimum lot size may develop with a use that is listed as permitted in the HSID.

C. Annexation Strategy

Property within the Helvetia area can only be developed as urban if it is served by public utilities at an urban service level. In order to receive urban services, property will need to be annexed into the City of Hillsboro. The City of Hillsboro has a passive annexation policy and will not forcibly annex properties within the Helvetia planning area. Past city practice has been to assist property owners in recently urbanized industrial areas with the annexation procedures in order to facilitate industrial growth. City annexation policy requires that property to be annexed must be adjacent to the City of Hillsboro City Limits and within the Urban Growth Boundary.

D. Metro Compliance

When Metro brought the Helvetia planning area into the UGB the area was designated a Regionally Significant Industrial Area (RSIA). This designation is described in Title 4 of the Metro Urban Growth Management Functional Plan and its intent is to protect a supply of sites for employment uses within the metropolitan region. Title 4 limits the amount of new commercial in RSIAs.[7] The proposed HSID complies with Title 4 by limiting new buildings for stores, branches, agencies or other outlets for retail uses and services to 3,000 square feet of sales or service area in a single outlet, or multiple outlets that occupy more than 20,000 square feet of sales or service area in a single building or in multiple buildings that are part of the same development project.

The Metro Conditions of Approval associated with Ordinance No. 04-1040B, the action that brought the Helvetia area into the UGB, stated that the city must develop a lot/parcel configuration plan that results in at least one parcel in the Helvetia area that is 50 acres or larger in size. The Conceptual Illustration A (Figure IV.1) shows a configuration of future users that accommodates at least one large, 50 acre+, industrial user. There are no tax lots in Helvetia larger than 50 acres, and only one tax lot that is approximately this size. To further

[7] In RISAs,

the region's and the city's goals to provide large industrial sites in the Helvetia area, the HSID restricts land divisions in the area. Lots larger than 10 acres in size in Helvetia may subdivide as long as the resulting land division creates one lot or parcel of at least 10 acres and the remaining lot(s) created contains at least one parcel of 5 acres of contiguous land.

E. Financing Strategy and Tools

1. Infrastructure Costs

It is assumed that private development will finance all onsite development costs in the Helvetia area (internal roads, onsite utilities, onsite open spaces and trails, etc.) and a portion of offsite development costs. As described in the infrastructure financing analysis (Appendix M), mandatory fees and charges that private developers are assessed at the time of development are expected to generate a surplus of revenues to finance offsite infrastructure costs associated with development in the Helvetia area.

Infrastructure costs related to development at Helvetia will fall into the following categories: Transportation (including storm drainage facilities), Water, and Sanitary Sewer. Detailed cost information for each of these categories can be found in separate technical memorandums: Appendix G (transportation), Appendix H (sanitary sewer), and Appendix J (water).

Existing City financing tools include required system development charges (SDCs) and traffic impact fees (TIF) from new development. SDCs and TIF revenues generated by development in Helvetia can be used to finance offsite improvements, including systemwide improvements. SDCs may also be used to reimburse developers for offsite sanitary sewer infrastructure costs.

Table V-1 illustrates the estimated costs and revenues for all onsite and offsite infrastructure improvements associated with the Helvetia concept plan. These are good faith estimates based on the preliminary Helvetia concept plan.

Table V-1: Summary of Costs and Revenues Associated with Helvetia Development

Infrastructure Type	Costs	Developer Requirements	TIF Revenues	Resulting Balance (Costs - Revenues)
Transportation	$54,587,386	$54,212,386	$2,870,783	-$2,495,783 (surplus)
Water	$1,130,000	$1,130,000	n/a	$0
Sanitary	$3,300,000	$3,300,000	n/a	$0

As shown above, revenues generated by development in the Helvetia area are projected to exceed the combined cost of onsite and offsite infrastructure improvements needed for the Helvetia concept plan by $2.5 million. Therefore, no funding gap is anticipated.

<u>Transportation Costs</u>

The Helvetia and Evergreen Area Future Transportation Conditions Analysis (see Appendix G) identifies transportation infrastructure improvements that build-out of the Helvetia area will require.

The projected cost of onsite transportation infrastructure in the Helvetia area is $54.2 million. An additional $375,000 in offsite transportation infrastructure costs is projected and will finance the addition of an eastbound turn late at the intersection of NW Jacobson Road and NW Century Boulevard.

<u>Transportation Revenues</u>

Development at Helvetia will contribute to transportation funding in two primary ways:

Onsite infrastructure: Developers will construct all onsite transportation infrastructure at their own expense.

TIFs: The City of Hillsboro collects TIFs for all new development, which is assigned to one of five general use categories: residential, business/commercial, office, industrial, or institutional. TIFs are calculated based on the total trips a development is projected to generate. Within each general use category, "unit factors" are assigned to different development types and reflect the magnitude of the impacts the development is anticipated to have on the transportation system. For example, within the industrial use category, warehouses, which generally have a very low job density, will generate fewer trips than industrial parks, which have a higher job density.

For industrial uses, total trips are estimated by multiplying a building's total gross square footage (TGSF) by the appropriate unit factor. The methodology for estimating total trips for most commercial uses is similar, except the unit factor is multiplied by a building's total gross leasable square footage (TGLSF). For hotels, however, total trips are estimated by multiplying the number of rooms by the hotel unit factor.

Table V-2 shows projected TIF revenues for the Helvetia area. Assuming a job density of 17.3 employees per acre, development in the Helvetia area is projected to produce $2.9 million in TIF revenues, which may be used to finance offsite improvements.

Table V-2: Projected TIF Revenues for Helvetia Concept Area.

Item	Area (acres)	Building Area (s.f.)	Description	No. of Units	Total Trips (Gross Bldg s.f. x No. of Units/ 1000)	Basis of Trip Rate	TIF estimate (Basis of Trip Rate x Total Trips)
Gross area	249.0						
less BPA easement	40.0						
less infrastructure/circulation (21%)	52.0						
Net development area	157.0						
Distribution Business 1	70.0	731,808	Warehouse	4.88	3,571	$308	$1,099,937
Distribution Business 2	17.0	177,725	Warehouse	4.88	867	$308	$267,127
Distribution Business 3	10.0	104,544	Warehouse	4.88	510	$308	$157,134
Industrial Business Park (2 @ 30 ac.)	60.0	627,264	Industrial Park	6.97	4,372	$308	$1,346,585
TOTAL	157.0	1,641,341					$2,870,783

Source: Leland Consulting Group

Revenues generated by development in the Helvetia area are expected to exceed the cost of onsite transportation improvements. What is not accounted for in Table V-2 or this analysis is the cost of offsite transportation improvements that will be needed regardless of development occurring in Helvetia.

Water Costs

The Water System Concept Design developed by CH2M Hill (see Appendix J) identifies water system infrastructure improvements that will be required for the Helvetia concept area, which will be served by the City of Hillsboro. The total construction cost estimate for Helvetia area water improvements, including a 30 percent contingency, is $1.13 million.

Water Revenues

The water system improvements described above are considered onsite improvements that would be the responsibility of developers. Thus, there will be no public utility obligations to fund water infrastructure at Helvetia.

Development at Helvetia will generate revenues based on SDCs that are levied on development as it occurs. These fees, assessed by TVWD, enable the District to build and maintain the internal capacity to serve the Helvetia area. The methodology for determining SDCs is described in CH2M Hill's technical memorandum. As previously noted, water demand generated by the Helvetia area can be accommodated by TVWD's existing system and will not trigger the need for any offsite improvements.

Sanitary Sewer Costs

The Sanitary Sewer Trunk Concept Design developed by CH2M Hill (see Appendix H) proposes one alternative for providing sanitary service to the Helvetia concept area. The total program cost estimate for Alternative 1, which will use gravity lines in NW Pubols Road and NW Schaaf Road to convey flow to a gravity mainline in NW Helvetia Road and construct a new pump station near the intersection of Helvetia Road and Jacobsen Road, is $3.3 Million.

Sanitary Sewer Revenues

Based on CH2M Hill's analysis of sanitary sewer infrastructure requirements, it is assumed that private development will bear the total cost of sanitary sewer improvements associated with build-out of the Helvetia area. Specifically, developer requirements will include:

Onsite infrastructure: Developers will be responsible for all onsite infrastructure costs.

Connection fees/SDCs: Clean Water Services (CWS), which will be the sanitary sewer service provider for the Helvetia Area, will assess SDCs to new development to finance connection charges, which may include:

a. Direct connections to the District sewer system;
b. Indirect connections to the District sewer system including, but not limited to, building additions, or expansions, which include sanitary facilities;
c. Change in the use of an existing connection; and
d. Substantial increase(s) in the flow or alteration of the character or sewage to an existing connection.

For industrial uses, connection fees will be calculated as Dwelling Unit Equivalents (DUEs) based on the estimated or actual metered flow in incoming water, or metered effluent. The fees are calibrated to match the expected true cost of any offsite improvements required by the development. Thus, there will be no unmet funding obligation as a result of development at Helvetia.

2. Financing Methods

Despite the fact that no infrastructure financing gap is projected, the City may wish to explore alternative funding sources to buy down the cost of development in order to attract private investment to the Helvetia area or to help pay for other planned, but unfunded, improvements. The City and Washington County, working with Metro and the State, will also need to identify funding sources to pay for offsite transportation costs associated with regional growth. A wide range of funding tools is available to support capital improvements and infrastructure planning in Oregon. Many transportation funding tools are funded via the Oregon Department of transportation (ODOT) through competitive grants that are offered annually or biannually. Local funding tools, such as urban renewal and LIDs, may be used to finance capital improvements within designated geographic areas or special districts.

The following programs and funding tools are some of the most common and most likely to be of use in the Helvetia concept area.

Tax Increment Financing/Urban Renewal

Tax increment financing (TIF) is one of the most powerful public funding tools for revitalization. TIF is a mechanism where public projects are financed by debt borrowed against the future growth of property taxes in a defined urban renewal district. The assessed value of all properties within the district is set at the time the district is first established (the frozen base). As public and private projects enhance property values within the district, the increase in property taxes over the base (the increment) is set aside. Debt is issued, up to a set maximum amount (the maximum indebtedness), to carry out the urban renewal plan and is repaid through the incremental taxes generated within the district. The duration of urban renewal districts is usually 15 to 20 years. When the district is retired, the frozen base is removed and all property taxes in the district return to normal distribution. Because urban renewal is such a useful tool for revitalization and can generate significant amounts of money for infrastructure, it should be strongly considered to help fund projects in the Helvetia Area. As a part of subsequent conceptual plan implementation, the City would need to prepare an urban renewal plan, which would identify specific projects to be funded and the likely funding capacity from tax increment revenues.

Local Improvement District

A Local Improvement District, or LID, is a special assessment district where property owners are assessed a fee to pay for capital improvements such as sidewalks, underground utilities, shared open space, and other features. LIDs are typically petitioned by and must be supported by a majority or supermajority of the affected property owners. Since LIDs are funded by private property owners, they can help share the funding burden in a public-private partnership. Further, since it requires private property owner support, it is a good mechanism to help organize property owners around a common goal. Such a mechanism could be a useful tool to fund shared amenities and infrastructure at Helvetia.

Oregon Pedestrian and Bicycle Program (ODOT)

A range of pedestrian and bicycle improvements will be a part of the Helvetia transportation infrastructure. ODOT provides grants for crosswalks, bike lane striping, and pedestrian crossing islands that fall within the rights-of-way of streets, roads and highways. Bike/ped grants usually fall between $80,000 and $500,000.

Oregon Transportation Enhancements (TE) Program

Using federal transportation funds, ODOT TE grants are awarded to local governments and other public agencies to support projects that improve communities and enhance the experience of traveling. New sidewalks, bike lanes, and pedestrian amenities such as benches and streetlights are eligible TE projects, as are the restoration of historic railroad stations, bus stations, and bridges. TE awards typically range from $200,000 to $1 million, and local governments must contribute ten percent of the project's cost.

State Transportation Improvement Program

The STIP is Oregon's adopted four-year investment program for major state and regional transportation systems, including interstate, state, and local highways and bridges, public transportation systems, and federal and tribal roads. It covers all major transportation projects for which funding is approved and project implementation is expected to occur during a certain time frame. The STIP includes all major transportation projects and programs in Oregon that are funded with federal dollars. It also includes state-funded projects that relate to the state highway system, and "regionally significant" locally funded projects in metropolitan areas that affect the state's transportation system.

Immediate Opportunity Fund (IOF)

The IOF program is a special program in the STIP administered by the ODOT Financial Services' Economics and Policy Analysis Unit. It was created in 1988 by the Oregon Transportation Commission (OTC) in order to quickly process and fund transportation improvements that would attract or retain jobs. The fund is a collaborative effort between the Oregon Economic and Community Development Department (OECDD) and ODOT. It is intended as quick-response or incentive funding for either targeted business development projects or business district revitalization projects. Projects are either pulled from a city or county's transportation system plan (TSP), or are small projects that are not listed in the TSP and may be added onto other larger projects.

Major Streets Transportation Improvement Program (MSTIP)

Washington County voters approved a third version of the MSTIP in 1995. The MSTIP uses property tax revenue to issue bonds for capital construction of major transportation projects with Countywide benefit. Most of these projects take place on County roads. From FY06-07 through FY11-12, $140 million has been allocated for projects in MSTIP C3.

Helvetia
concept plan

Existing Conditions Report

Prepared for:
The City of Hillsboro

May 2007

Helvetia Concept Plan Project Team

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Appendix

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I. Introduction

In 2002, the Metro Council added the 249-acre Helvetia Concept Planning Area (Figure I-1) to the Region's Urban Growth Boundary (UGB) to help provide a 20-year industrial land supply within the Portland Region as required by State law. The Helvetia area is now in unincorporated Washington County. The City of Hillsboro has an agreement with Washington County to prepare the industrial area concept plan for future employment growth in Helvetia. Concept plans are required when lands are added to the UGB to ensure that the transition over time from rural to urban uses occurs efficiently and consistent with the identified land needs that justified their inclusion. Washington County is adopting interim land use measures that will limit major land divisions until the concept planning is complete. Ultimately, in order for industrial development to occur in the Helvetia concept planning area, this area will need to annex to the City of Hillsboro. The City hired a team of land use planning, transportation, natural resources, real estate and economic development consultants in January 2007 to assist with the development of an Industrial Development Concept Plan for Helvetia.

Establishing a solid understanding of existing conditions is key to developing an industrial development concept for Helvetia. To this end, the intent of this report is to establish a comprehensive foundation and understanding of existing site and area conditions in the Helvetia concept planning area (Figure I-2). The contents of the report include an analysis of existing physical, policy, and economic characteristics that define the area and an identification of issues that will serve as the basis for developing the industrial design and land use concepts and, ultimately, the Title 11 Concept Plans.[1]

More than a "snap shot" of the existing landscape and regulatory environment, the information compiled in the Existing Conditions Assessment will greatly influence each task that is required to develop the concept plan. Natural resource information, for example, is a baseline for preliminary Goal 5 work to be undertaken later in the project. Economic characteristics information included in this report will inform the later work on the economic strengths and opportunities analysis for the area. Informed by the Existing Conditions Assessment, subsequent reports developed for this project will directly influence the design of the Helvetia transportation system and concepts for the future land use plan.

[1] See description of Title 11 under the *Metro* section of this report.

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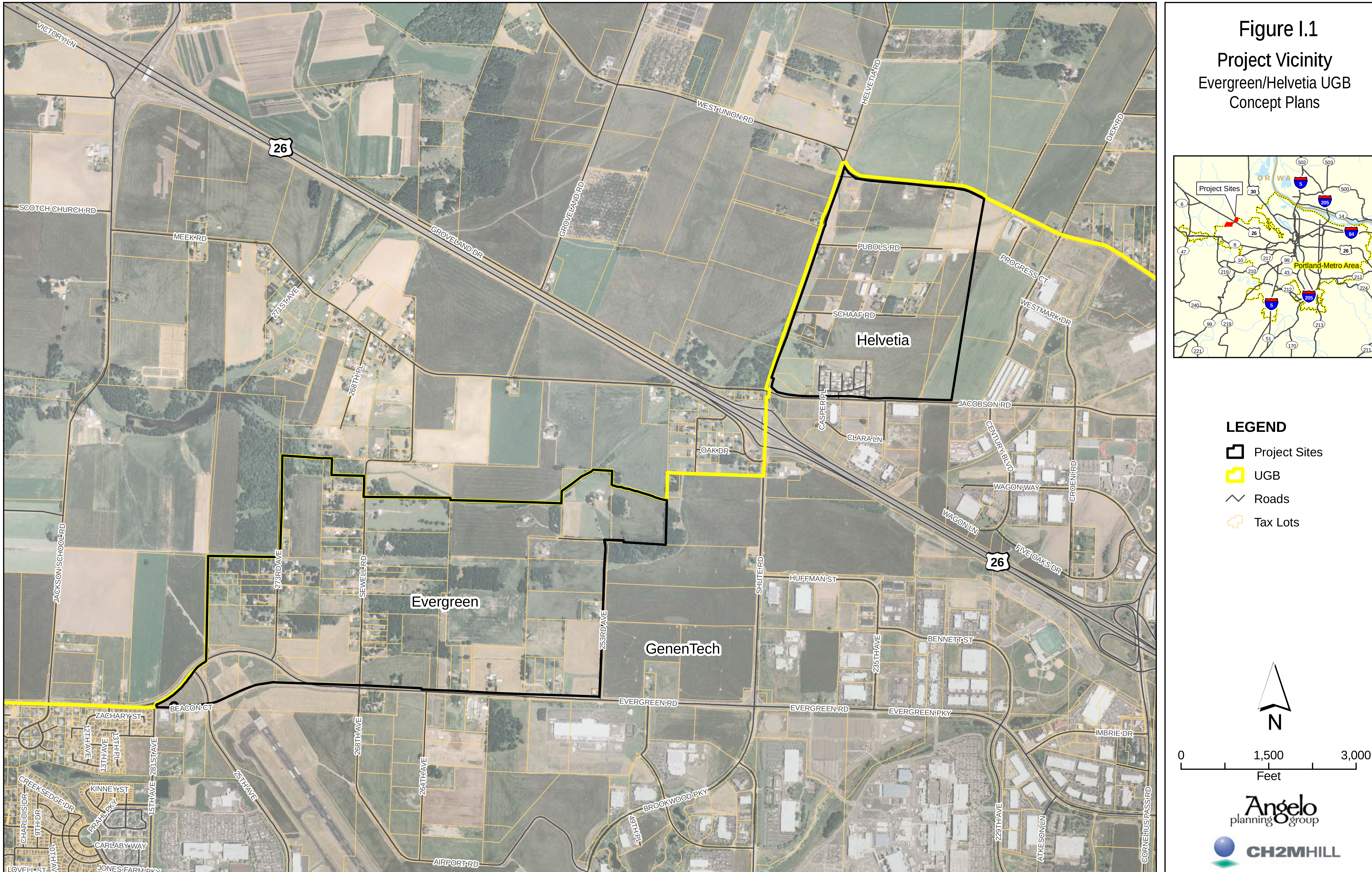
Figure I.1

Project Vicinity

Evergreen/Helvetia UGB Concept Plans



Angelo planning group

CH2MHILL

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Figure I.2

Helvetia Concept Planning Area

Evergreen/Helvetia UGB Concept Plans

LEGEND

- Helvetia Site (Planning Area = 242.12 ac)
- UGB
- Roads
- Tax Lots

N

0 500 1,000
Feet

Angelo planning group

CH2MHILL

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II. Site Descriptions

The Helvetia planning area is located to the northeast of downtown Hillsboro. It encompasses 249 acres and lies northeast of the Highway 26 Shute Road interchange, east of Helvetia. West Union Road forms the northern boundary of the study area and Jacobson Road is the southern most boundary. Schaaf Road and Pubols Road are the two main east-west roads.

A. Land Features

The Helvetia planning area is characterized by relatively flat land, historically used for farming. The topography is gently sloping to rolling, ranging from approximately 255 feet elevation in the eastern portion of the planning area to approximately 185 feet at the Waible Gulch flooplain in the west. Areas along Helvetia in the northern portion of the study area contain mapped wetlands and areas of fish and wildlife habitat associated with tributaries of Waible Gulch and the McKay Creek watershed (see Natural Resources section in this report).

B. Land Uses in Study Area

Existing development in the Helvetia planning area is primarily associated with farm practices, with the notable exception of a mobile home park (Country Haven) located off of NW Jacobson Road. There is also a commercial building located in the corner of the site, at the intersection of West union Road and Helvetia. Bonneville Power Administration power lines run through the western part of the site.

C. Surrounding Land Uses

Agricultural land surrounds the Helvetia planning area to the west and north. Light industrial uses lie to the east and south. Notable businesses in the area include Credence Systems Corporation, between Sunset Highway and Jacobson Road, and Convergys Corporation, south of Sunset Highway.

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III. Policy Framework

A. Metro

In 2004 Metro Ordinance No. 04-1040B amended the UGB to include the Helvetia area. Metro's Urban Growth Management Functional Plan provides tools that help meet goals in the 2040 Growth Concept, Metro's long-range growth management plan. The Urban Growth Management Functional Plan is Section 3.07 of the Metro Code and is comprised of 12 titles. Two of the titles, Title 4 and Title 11, are directly applicable to the development of a concept plan for the Helvetia area.

1. Title 4

The purpose and intent of Title 4 of the Urban Growth Management Functional Plan[2] is to provide and protect a supply of sites for employment uses within the metropolitan region. This is achieved through limiting the types and scale of non-industrial uses in the following types of specially designated areas: Regionally Significant Industrial Areas (RSIAs), Industrial Areas, and Employment Areas. The Helvetia area is a designated RSIA. The City of Hillsboro, which will have land use planning authority over this area once it is annexed, must derive specific plan designation and zoning district boundaries for the Helvetia area. If necessary, land use regulations will need to be revised to limit the size and location of new buildings for retail commercial use and retail and professional services to ensure that they serve primarily the needs of workers in the area.

Title 4 limits the amount of new commercial in the RSIA designation. New buildings for stores, branches, agencies or other outlets for retail uses and services can not occupy more that 3,000 square feet of sales or service area in a single outlet, or multiple outlets that occupy more than 20,0000 square feet of sales or service area in a single building or in multiple buildings that are part of the same development project.[3]

Land division is also regulated by Title 4. Lots or parcels larger than 50 acres may be divided into smaller lots and parcels pursuant to a master plan approved by the city so long as the resulting division yields at least one lot or parcel of at least 50 acres in size. Lots or parcels 50 acres or larger also may be divided into any number of smaller lots or parcels consistent with the approved master plan, so long as at least 40 percent of the area of the lot or parcel has been developed with industrial uses or uses accessory to industrial use.[4] Exceptions to these restrictions include dividing lots or parcels into smaller lots or parcels to provide for public facilities and services, to protect a natural resource or provide a public amenity, to separate a lot or parcel containing a nonconforming use, or to allow the creation of a lot within a master planned development for financing purposes.[5] The city may also allow the

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[2] Urban Growth Management Functional Plan is Section 3.07 of the Metro Code.

[3] An exception to the retail use restrictions are training facilities whose primary purpose is to provide training to meet industrial needs, and uses related to a public use airport.

[4] The Metro Conditions on Addition of Land to the UGB associated with Ordinance No. 04-1040B, the action that brought the Helvetia area into the UGB, states that the city or county with land use authority may not allow the division of a lot or parcel that is 50 acres or larger into lots or parcels smaller than 50 acres. There is only one parcel in Helvetia that is subject this stipulation.

[5] See Title 4 Section 3.07.420(4).

lawful use of buildings, structures, or land existing at the time of the city's adoption of Title 4 plan and code amendments to continue and to expand to add up to 20 percent more floor area and 10 percent more land area.

2. Title 11

Title 11 of the Metro Urban Growth Management Functional Plan guides planning for areas brought into the UGB. "Interim protection" measures in Title 11 include prohibiting local government from approving regulation or zoning map amendments in the area brought into the UGB that allow commercial or industrial uses not allowed under regulations in effect prior to the UGB amendment. Title 11 also restricts any land division or partition that would result in a new parcel that is less than 20 acres in size.

For RSIAs, such as Helvetia, Title 11 restricts local governments from approving any commercial use that is not accessory to industrial uses in the area or approving schools, churches, or other institutional or community serve use intended to serve people who do not work or reside in the area. In this way Title 11 provides interim protection from non-industrial uses until such time local government can amend the local comprehensive plan and land use ordinance to guide growth in the subject area. Title 11 requires that local comprehensive plan amendments addressing land added to the UGB be consistent with all the applicable titles of the Metro Urban Growth Management Functional Plan and implement the Regional Urban Growth Goals and Objectives (RUGGO) and the 2040 Growth Concept. In compliance with Title 11, and the conditions under which the Helvetia area was added to the UGB, the comprehensive plan amendments for Helvetia will need to include:

- Provision for annexation to the City of Hillsboro to ensure that all the required urban services will be available to serve the site.
- Provision for sufficient industrial development for the needs of the area to be developed consistent with the RSIA design type.
- A conceptual transportation plan consistent with the Regional Transportation Plan.
- A natural resource protection plan.
- A conceptual public facilities and services plan.
- An urban growth map of the planning area that includes the location of the street and public utilities, natural hazard areas (steep slopes, floodplains, etc.), and general locations for the land use types.

3. New Look at Regional Choices

The Metro Council is currently undertaking a process to find collaborative, new, and creative ways to plan for the arrival of a million new residents in the Metro region in the next 25 years. This process has been coined the "New Look at Regional Choices," or "New Look" for short. The Metro Council is working with leaders and practitioners from businesses, governments and other interests to identify new growth management tools and pursue financial investment strategies in order to create a desired vision for how the region will grow.

According to Metro's website, the New Look is generally divided into three broad policy categories:

- Investing in communities – how to steer growth into existing commercial areas and promote vibrant mixed-use centers that use land most efficiently and provide more housing and transportation options for residents.

- The shape of the region – how to manage expansion of the urban growth boundary in a way that protects valuable agricultural land, but also allows for responsible growth in outlying areas.

- The Regional Transportation Plan – how to update the plan to make it financially realistic and support the region's growth management values.

The outcome of the New Look may be recommended changes to state law and local policies that enable the implementation of the agreed upon strategies for managing growth.

4. Regional Transportation Plan

The 2004 Regional Transportation Plan (RTP) lays out the 20-year priorities for road, transit, freight, bicycle and pedestrian improvements. A goal of this planning effort is a more streamlined plan that better advances regional policies, public priorities and local efforts to implement the 2040 Growth Concept. The RTP defines regional transportation policies which all city, county, TriMet, ODOT, and Port of Portland plans must follow. These policies are for all forms of travel including motor vehicle, transit, pedestrian, bicycle and freight. The plan then establishes priority projects for each mode based on the stated policies. The plan is based on forecasts of growth in population, households and jobs as well as future travel patterns and analysis of travel conditions. In identifying priority projects, the plan estimates availability of federal, state and local funding for transportation improvements. Cost estimates for each project are also developed, as well as funding strategies identified.

The list of street network improvements is taken from the Financially Constrained 2004 Regional Transportation Plan. The full list for Washington County includes over 250 projects representing over $2 billion in new improvements; however, we have selected those projects that are relevant to the Helvetia Concept Plan area and listed them in Table III-1.

Table III-1: Selected 2004 Regional Transportation Plan Projects

RTP #	Project Name	Project Location	Project Description
3133	Cornelius Pass Road Interchange Improvement	US 26/Cornelius Pass Road	Construct eastbound on-ramp, westbound off-ramp and southbound auxiliary lane
3139	US 26 Overcrossing - Sunset IA	NW Bennett Avenue to NW Wagon Way	Construct two-lane new overcrossing with sidewalks and bike lanes to better connect areas north and south of US 26
3140	229th Avenue Extension	NW Wagon Way to West Union Road	New three-lane facility with sidewalks and bike lanes

B. *Washington County*

1. Washington County Comprehensive Plan

Washington County Ordinance No. 671 (adopted April __, 2007) amends the West Union Community Plan to include the Helvetia planning area as a "subarea." The West Union Community Plan is an adopted element of Washington County's Comprehensive Plan. Community plans apply to unincorporated portions of the County within the metropolitan area regional Urban Growth Boundary and outside of a city planning area. The West Union Community Plan is an area and site-specific application of County Comprehensive Planning policy and a description of community development activities envisioned for the planning area.

Prior to Ordinance No. 671, the West Union Plan was last updated in 2003. The plan contains "general design elements" that must be considered during the development review process. These elements – which pertain to such community design aspects as landscaping, setbacks, signage, and lighting – are only applicable to development that may occur prior to annexation to the City of Hillsboro.

Ordinance No. 671 amends the text of the West Union Community Plan to include a description of the "Helvetia Subarea." This text applies the County Future Development-20 Acre (FD-20) designation to the Helvetia area and stipulates that this designation will be maintained until which time the property is annexed to the City of Hillsboro and rezoned. The ordinance also maps and describes the Area of Special Concern 1. The designation of "Area of Special Concern," where applied to one or a combination of several parcels of land, denotes the presence of certain design opportunities or constraints. In the case of Helvetia, Area of Special Concern 1 stipulates that no lot or parcel 50 acres or larger may be subdivided or partitioned into smaller lots or parcels. "ASC #1" is mapped and contains the only parcel in the Helvetia study area that is 50 acres or larger.

Finally, Ordinance No. 671 amends the Goal 5 Resource for Future Development Areas map in Policy 41 (Urban Growth Boundary Expansions) of the Comprehensive Framework Plan for the Urban Area and the Significant Natural and Cultural Resources Map in the West

Union Community Plan to apply the Goal 5 Resource designations identified in the Rural/Natural Resource Plan.

2. Washington County Community Development Code

Washington County Ordinance No. 671 (adopted April __, 2007) amended the West Union Community Plan to include the Helvetia area on the Washington County Land Use Districts Map with a Future Development-20 (FD-20) designation (see Figure III-1). As described in the Community Development Code, the FD-20 District applies to the unincorporated urban lands added to the UGB by Metro through a Major or Legislative Amendment process after 1998. The intent of the FD-20 District is to retain and encourage limited interim uses prior to the completion of urban comprehensive planning for future urban uses is complete.

In accordance with the FD-20 District code provisions, lawful nonconfoming uses in the FD-20 District may be expanded or rebuilt through a Type II procedure when in conformance with the adopted Comprehensive Plan for area. Expansion or replacement is subject to the provisions of development review and may not include new uses.

Allowed new uses in the FD-20 District may be approved through a Type I approval procedure (Director decision) if they meet certain conditions, including that they are on an existing lot, are exempt from application of the Public Facilities Standards in Section 501-2, and are not in an Area of Special Concern. Type I allowed uses include detached dwelling units, home occupations, and co-located antennas. Those that can not meet the requirements of the Type I approval require a Type II procedure (Director decision with public notice) or Type III procedure (public hearing before a Planning Commission or Hearings Officer). Type III uses include churches, commercial greenhouses, commercial equestrian uses, day care centers, and schools.

The minimum lot area in FD-20 is 20 acres. Exceptions to this regulation may be given for partitions needed for public facilities and services associated with the provision of sewer, water, school, fire, and park and recreation services (Section 308-6.1). Side yard setbacks are as follows: 30-foot front yard; 10-foot side yard; 30-foot street side yard; 25-foot rear yard.

3. Washington County Transportation System Plan

The Washington County TSP (p. 27, Figure 9) identified a few areas near the study area for additional study:

- US 26 Sunset Highway – east from Cornelius Pass Road
- Meek Road – realignment at Shute Road

The following are proposed collectors in the Washington County TSP (Figure 4C):

- NW 264th Avenue / Evergreen Road to Brookwood Parkway between Dawson Creek Drive and Penny Way
- Extension of Century Boulevard south to Jacobson Road to complete connection from West Union Road
- Century Boulevard to NW 229th Avenue (crossing Hwy 26)

The Washington County TSP (Figures 12A and 12C) identifies the intersection of Cornelius Pass Road/West Union Road as a Rural Pedestrian Activity Area. Off-street trails (existing and planned) are identified east (passing through the study intersection of Corneilus Pass Road/Jacobson Road) and north of the Helvetia Concept Plan site. Adjacent to the Helvetia Concept Plan site, Helvetia Road and West Union Road are identified as Rural Bikeways (Figure 13).

4. Washington County MSTIP Projects

The next Major Street Transportation Improvement Program (MSTIP 3C)[6], which is managed by Washington County, has committed approximately $140 million to 19 projects between 2007 and 2012. The only notable MSTIP project for the Helvetia Concept Plan area is the addition of turn lanes and bike facilities at the intersection of West Union Rd/Helvetia Rd. These improvements have been planned for years, and may not fully address improvements required to accommodate this project.

C. City of Hillsboro

1. City of Hillsboro Comprehensive Plan

Hillsboro's stated goal for urbanization (Section 2 of the Comprehensive Plan) is "to provide for an orderly and efficient transition of land from rural to urban use through the identification and establishment of areas designed to accommodate the full range of urban uses within the Hillsboro Planning Area." Policies include requiring development to occur according to the availability of urban services and within the context of the Urban Planning Area Agreement between the city and Washington County and encouraging property owners to maintain the present rural use and character of undeveloped or underdeveloped lands within the Hillsboro Planning Area until such land is required and proposed for urban use. It is city policy that land use designations within the Hillsboro Planning Area are designed to accommodate projected commercial and industrial growth and population densities.

An implementation measure applicable to new industrial areas is as follows:

> *(K) In order to protect development opportunities for large lot industrial uses until such time as there is no demonstrated demand or need for such large lots; and to provide opportunity for location of compatible small and medium size industrial uses near such large lot industrial uses; the City may place a Special Industrial District (SID) overlay zone on specific areas designated industrial on the Comprehensive Plan Land Use Map. The Special Industrial District shall limit development in any areas so zoned to primarily larger lot industrial projects.*

Section 10, Economy, of the Comprehensive Plan explains the limitations of industrial expansion within the City of Hillsboro, given historic settlement patterns. This section concludes that if Hillsboro is to become economically less dependent on Portland and other cities, then "sufficient land must be designated industrial in other parts of the Hillsboro Planning Area and sufficient public facilities and services made available to attract industry

[6] http://www.co.washington.or.us/deptmts/lut/cap_proj/mstiphis.htm

and allow for the development of efficient industrial land use patterns." It is the city's policy that:

> *(2) Sufficient land shall be designated industrial on the Comprehensive Plan Map to:*
> *(a) Attract and accommodate both labor intensive and land intensive industrial activities.*
> *(b) Provided areas for different types of industrial developments.*
> *(c) Develop a diverse industrial base offering an increasing number of employment opportunities.*
> *(d) Decrease the property tax burden on residential property.*

Other policies related to industrial development include using a variety of implementation measures – such as tax incentives, preferential assessments, and capital improvement programming – to promote and encourage the expansion and establishment of industries and planning for utilities in a manner that supports industry. Specific to the Hillsboro Airport, the city has a policy that land in the vicinity of the airport should be designated for uses which will take advantage of the special services provided by the Port facility (Subsection III.B, Policy 1).

Implementation Measure 1 under Section 10 states that "(t)he Land Use Map shall designate adequate vacant land of various types and sizes for industrial and commercial development." Another implementation measure related to industrial land is as follows:

> *(4) To minimize conflicts between industrial and residential land uses, the City shall require M-P Industrial Park zoning on any Industrial-designated parcel zoned or rezoned following the effective date of this measure, if that parcel is subject to one or both of the following criteria: (a) the parcel is located in a Specially-Regulated Area (SRA); and/or (b) the parcel is located adjacent to an area designated Residential.*

The city's goal of maintaining and improving the quality of the air, water and land resources is found in Section 7, Air, Water and Land Resource Quality. Policies under this section include the city's intention to "design a storm sewer and sanitary sewer master plan and develop implementation measures necessary to assure that a storm sewer and sanitary system are provided to areas designated urban (Policy B)." Other policies address the city's intent to discourage total dependence on the automobile by encouraging and promoting less polluting methods of transportation (Policy A) and requiring industrial and commercial activities to shall operate within all applicable state and federal environmental standards regarding waste and process discharges (Policy D). This section also emphasizes that new development shall be allowed only if urban services such as water, sewer, and streets, are available (Policy G).

The city's policy to promote and encourage the construction of energy-efficient residential, commercial and industrial structures also applies to industrial development in Helvetia (Section 11, Energy).

Consistent with Statewide Planning Goal 11, Section 12, Public Facilities and Services, includes goals and policies that ensure the orderly and efficient provision of services to urbanizing areas and that future growth is guided and supported by the sufficient and timely provision of public facilities. A general policy applicable to the Helvetia area is as follows:

> *(A) The extension of a public facility, utility or service outside the urban area shall occur only in conjunction with an expansion of the Urban Growth Boundary and shall be provided at a level consistent with the intended density and designated land use for the area. (Amended by Ord. No. 5102/1-02.)*

Implementation Measures under Section 12 include coordination with applicable special districts and government entities. This includes coordination with Washington County, Tualatin Valley Water District (for water), and Clean Water Services (for sewer and storm drainage).

As stated in Section 12, the City completed a Public Facilities Plan (PFP) in 2001 in accordance with Goal 11 and OAR 660-011. The PFP was adopted as a supporting document to the Comprehensive Plan. The PFP includes the following elements:

- *(1) Interagency Coordination and Decision Making;*
- *(2) Existing Conditions and Future Needs Analysis;*
- *(3) Capital Improvement Project List and Financing Plan; and*
- *(4) Maps that identify the Planned Improvements.*

The PFP includes the Public Facilities Plan 20-Yr. Capital Improvement Projects List, which is an estimate of the infrastructure improvements needed to serve planned urban development in the Hillsboro urban growth boundary for the planning period.

2. City of Hillsboro Zoning Ordinance

The Helvetia area lies outside of the City of Hillsboro's city limits and is not subject to the city's zoning ordinance. However, land within the Helvetia area can not urbanize without first being brought into the city limits; upon annexation, parcels within the Helvetia area will be given a city plan designation and urban zoning. The city has two industrial zones: M-2 and M-P (Industrial Park). The city could apply either of these two existing industrial zones to the Helvetia area upon annexation, or could adopt a new industrial zone that better implements the concept plan developed for Helvetia. For the Shute Road concept plan (see *Shute Road UGB Concept Plan* overview in this report), the city applied the M-P Industrial Park zone to the Shute Road Concept Planning area and adopted the Shute Road Site Special Industrial District (Section 134A), which is described as an overlay zone intended to supplement most of the provisions of the underlying M-P, Industrial Park Zone for the Shute Road Site. The provisions of the District take precedence when they are found to be in conflict with provisions in the underlying M-P zoning.

Uses permitted outright in the M-P zone include manufacturing, wholesale distribution, commercial support services, medical and dental offices/clinics, and office uses. Conditional uses include conference centers, veterinary clinics and hospitals, and colleges and universities. Heavy industrial uses, such as rock crushing, aggregate storage and distribution, and concrete or asphalt patch plants, are not allowed. Commercial support services are permitted and these include banks, restaurants, day care centers, quick print shops, and office supply retailers.

Building height in the M-P zone is restricted to 45 feet, with the exception of high profile industrial buildings,[7] which can be as high as 85 feet. For buildings 45 feet in height or less, the front yard setback is 35 feet and the other yards must be set back a minimum of 25 feet, or 50 feet if abutting a residential zone. High profile industrial buildings are subject to these setback requirements, with the additional setback of one foot for each foot of total structural height, if located adjacent to a residential zone, and one foot for each foot of structural height above 45 feet, if adjacent to commercial or industrial zones. Buildings in the M-P zone may not occupy more than 50% of the lot area.

3. Shute Road UGB Concept Plan

The Shute Road site was added to the Urban Growth Boundary (UGB) by Metro in December 2002. The Metro conditions of approval specific to the site area established the site as a regionally significant industrial area (RISA). The conditions of approval also stipulated that the development of a concept plan result in either one 100-acre parcel or three 50-acre parcels. The site consists of approximately 203 acres and is located at the intersection of Shute Road and Evergreen Road, directly to the east of the Evergreen area. Like Helvetia, the Shute Road site was added to the UGB for the purpose of providing large lots for industrial development.

As is also the case with Helvetia, the city was required to prepare a concept plan prior to industrial development taking place within the Shute Road site. The Shute Road UGB Concept Plan shows how the site can be served by municipal services and the transportation system, addresses natural and historic resources identified on the property, and other Metro Urban Growth Management Functional Plan requirements. The Shute Road UGB Concept Plan was complete July 31, 2003. The Hillsboro Comprehensive Plan and Zoning Ordinance were amended in 2004 to implement the Concept Plan.

The Concept Plan illustrates three concepts that allowed for the development of either one 100-acre parcel or three 50-acre parcels. Each concept allows for the initial development of one 100-acre parcel, while at the same time providing the flexibility such that if a 50-acre parcel was initially established, the remaining land would be sufficient for the provision of either two additional 50-acre parcels or one 100-arce, thereby meeting the Metro conditions of approval for the site. All three concepts extend public infrastructure, including roads, water, sanitary, and storm sewer, through the entire site to serve the development needs of the area. Each concept extends NW Huffman Road through the site from east to west, albeit with different conceptual alignments. All concepts provided for a connection between 253rd Avenue and Dawson Creek Parkway, either by using the existing 253rd/Evergreen/Dawson Creek Parkway intersections, or a new alignment of 253rd with Dawson Creek Parkway.

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[7] High Profile Industrial Building is defined in the code as "(a)n industrial building designed and constructed for manufacturing or warehouse use, characterized by highly specialized mechanical and/or automated equipment requiring structural heights greater than 45 feet."

According to the Concept Plan, the Advisory Committee working on the project selected Concept A as the Preferred Design Concept because of the flexibility and minimal infrastructure requirements. The Advisory Committee chose Concept B as the First Alternative Design Concept. The adopted Comprehensive Plan policy in Section 20, Shute Road Industrial Site, indicates that:

> *(D) Development within the Shute Road Industrial Site shall be generally consistent with the alternative high-technology industrial land planning and design concepts shown in the Preferred Design Concept – Concept "A" or, if applicable, the "Alternative Design Concept – Concept "B" (shown in Figures 20-1 and 20–2, respectively).*

Implementation Measures under Section 20 include the provision that prior to annexation to the city and adoption of urban industrial zoning on properties within the Shute Road Industrial Site, land uses within the site will continue to be governed by the existing Washington County agricultural zoning (III.C) Other measures include the prohibition of new commercial retail uses (III.D) and ensuring that there is compatibility between high-technology industrial uses and supporting uses, and nearby agricultural uses and operations through the city's Development Review process (III.E). The Implementation Measures also provide protection for the Waible Creek tributary riparian corridor and the upland wildlife habitat resource located in the northwest portion of the Site by designating it with "Level 1" ("moderately protect") protection, as prescribed by Hillsboro Zoning Ordinance Section 131A, Significant Natural Resources Overlay District (III.F).

Consistent with the Comprehensive Plan, the city amended the Zoning Ordinance to include the Shute Road Site Special Industrial District (SSID) overlay zone. This overlay zone is intended to supplement the underlying M-P, Industrial Park Zone for the Shute Road Site. The provisions of the District take precedence when there are conflicts between the provisions of the SSID and the underlying M-P zoning.

Land uses within the SSID are limited to:

> *(1) Businesses engaged in high-technology product manufacturing;*[8]
> *(2) Businesses and other land uses that support high-technology product manufacturing; and*
> *(3) Commercial office uses that are accessory to and in the same building containing businesses engaged in high-technology product manufacturing or businesses and other land uses that support high-technology product manufacturing.*

[8] As defined in Section 134A, C.(1) . A "high-technology product manufacturing" use means and includes any high technology enterprise engaged in the business of manufacturing high-technology-related products, either as the main on-site activity or in conjunction with on-site experimental product research, testing or prototype production; or, any other high-technology industrial use that needs to use a dependable and uninterruptible supply of specialized dual-feed electric power or nitrogen gas in order to engage in the manufacture of its products.

Provisions in the code clarify that the required 100-acre or 50-acre lots may be reduced in size to accommodate necessary transportation infrastructure or natural resources that restrict development (Section 134A, D.(2).

Development within the SSID is subject to review and approval by the Planning Director in accordance with the procedures prescribed in Section 133, Development Review, of the Zoning Ordinance. The Planning Director may approve any developments that accomplishes the large-acreage requirements (Section 134A,D.2(a)) in accordance with the purpose of the District.

4. City of Hillsboro Transportation System Plan

The 2004 City of Hillsboro Transportation System Plan (TSP) Update lists a number of projects in the study area that were based on future forecasts that most likely did not include the Evergreen or Helvetia Concept Plan sites. The projects listed in Table III-2 will be reviewed and modified, as needed, through this planning process.

Table III-2: City of Hillsboro TSP Priority Projects

Section	Project
Pedestrian Master Plan Priority Projects (Table 1-1)	NW Century Blvd from Bennett St to Wagon Way (part of the roadway extension of Century Blvd to West Union Rd)
	NW Shute Rd from Evergreen Rd to Hwy 26
Bicycle Master Plan Priority Projects (Table 1-2)	NW Century Blvd from Bennett St to Wagon Way (part of the roadway extension of Century Blvd to West Union Rd)
	NW Shute Rd from Evergreen Rd to Hwy 26
	Bethany Pond Trail from Cornelius Pass Rd to Rock Creek Blvd (multi-use trail)
Highest Priority Motor Vehicle Projects (Table 1-3)	Huffman Street – extend west of Shute Rd to 253rd Ave
Study Intersection Projects (Table 1-4)	Shute Rd/Evergreen Rd – add 2nd EB left turn lane, EB and WB right turn lanes
	Shute Rd/US 26 EB ramps – install traffic signal, construct interchange improvements
	Shute Rd/US 26 WB ramps – add SB through lane, construct interchange improvements

In addition to the priority projects listed above, the Hillsboro TSP (Figure 1-8) also shows planned traffic signals at the following locations:

- Shute Rd/Huffman St
- Helvetia Rd/Jacobson Rd (realigned)
- Jacobson Rd/Century Blvd
- Jacobson Rd/Cornelius Pass Rd
- West Union Rd/Century Blvd

A few of the proposed collectors shown in the TSP maps (Figure 1-9) are not included in priority project lists, but may be important to the development of the Helvetia Concept Plan. Those proposed collectors are:

- Extension of Century Boulevard south to Jacobson Road to complete connection from West Union Road
- Realigned Meek Road

Planned sidewalks (Figure 1-2) and bike lanes (Figure 1-3) are shown in the TSP adjacent to the Helvetia Concept Plan site along Jacobson Road and Shute Road.

D. State of Oregon

1. Environmental Assessment

In 2006, the Oregon Department of Environmental Quality published a guidance document for environmental assessment of formerly used agricultural lands that have been converted, or that are likely to be converted, to residential, school, commercial, or industrial use. The document, entitled *Guidance for Evaluating Residual Pesticides on Lands Formerly Used for Agricultural Production*, is directed at DEQ staff conducting or overseeing site assessments on former agricultural lands planned for non-agricultural use to determine the potential human health and environmental effects of pesticides and associated metals.[9] The guidance document applies to former agricultural land that was ever under cultivation, as well as to fallow, former agricultural land that has not been disturbed beyond normal disking and plowing practices. The document is used for guidance; it is not a regulatory document and does not contain requirements of obligations.

The document includes the definition of pesticide, a description of the physical properties of pesticides, and identifies the types and residues found in Oregon. It includes steps to take to evaluate historical pesticide usage and sampling strategies at agricultural sites.

The type of appropriate remedial actions at these sites depends partly on the types of reuse anticipated. The guidance document has two sampling schemes, one for residential/school reuse and a second for industrial/commercial reuse. The document includes "default sampling schemes" that correspond to the two use types, with information such as the size and number of samples to be taken according to the size of the area captured in tabular format.

The final section of the document gives some information about risk screening in DEQ's Cleanup Program:

> *Risk-based decision making for all types of contaminated sites involves evaluating current and reasonably likely future risks that site contamination poses to human health and the environment, and using that information to develop the best combination of cleanup and site-management actions that will reduce risks to acceptable levels. Contaminants found*

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[9] See Hazardous Substance Remedial Action Rules, OAR 340-122-0010 through 0115 and ORS Chapter 465.

above background levels are compared to PRGs [Preliminary Remediation Goals] and DEQ's risk-based concentrations (RBCs) to evaluate whether these contaminants pose unacceptable risks to current or future site users, construction and/or excavation workers, or surrounding properties.

This section notes that, in addition to the potential human health risks, pesticides may also affect the ecology. Evaluation of pesticides on agricultural lands that have been, or are likely to be, converted to other uses generally will not be required to an evaluation of ecological risk unless the site's redevelopment includes ponds, wetlands, or other significant natural habitat. In such cases, a Level 1 Scoping Assessment will need to be prepared.[10]

2. Industrial Site Certification Steps

Oregon Governor Ted Kulongoski signed Executive Order 03–02 on February 20, 2003. The Executive Order had two major components, the creation of an Industrial Lands Task Force, charged with evaluating the state's short-term and long-term industrial lands supply, and the development of the "Shovel Ready Industrial Sites Initiative." The Shovel Ready Industrial Sites Initiative directed the Governor's Economic Revitalization Team (GERT) to work in partnership with the Oregon Economic Community Development Department (OECDD) to, among other things, develop an Industrial Site Certification Process.

State certification documents and assembles information needed by a business that is considering acquisition and use of an industrial site. A certified site meets specific, market-driven criteria based on the standards of real estate professionals and of the industries that would develop and operate at these locations. Each site receives a consistent level of review and analysis of existing conditions pertinent to development, such as wetlands, contamination, listed species, cultural resources, land use regulation, suitability for building, and the availability and capacity of transportation facilities, water, sewer, electrical power and telecommunications. Site certification can be used as a marketing tool and adds value to certain locations by making their utilization less expensive and risky for the prospective employer. Certification also entails a commitment of state and local governments to facilitate the site development. Certified sites are ready for construction within six months or less after being chosen for development. See the Economic Community Development Department website (http://www.econ.state.or.us/IC.htm) for more information regarding industrial site certification.

3. Sunset Highway Interchange Study

The Sunset Highway Interchange Study was completed in August 1998 for US 26 between 185th Avenue and Glencoe Road. The study used future volumes for 2015 to identify future deficiencies and develop alternatives for each interchange. The recommended alternative for the Shute Road interchange included constructing a westbound to southbound loop ramp as well as incorporating the intersection of Helvetia Road/Jacobson Road into the interchange ramp intersection via a roundabout or to realign Jacobson Road north of the interchange. It

[10] For additional information about the risk-screening process in Oregon, see DEQ's web page on Human Health Risk Assessments: http://www.deq.state.or.us/wmc/cleanup/hh-intro.htm.

should be noted that the priority project list contained in the 2004 Hillsboro TSP update includes the realignment option.

4. Cornelius Pass Road/Highway 26 Interchange Area Management Plan

Pursuant to an Intergovernmental Agreement (IGA) between Washington County and ODOT, an interchange area management plan (IAMP) was required for improvements to the Cornelius Pass Road/Highway 26 interchange facility. The interchange improvements were necessary in order to alleviate congestion and extensive vehicle queuing on the interchange ramps during peak hours. The stated objectives of the 2003 Cornelius Pass Road IAMP are to protect the function of the interchange, provide safe and efficient operations on US 26 and Cornelius Pass Road, and ensure ODOT involvement in future land use decisions that could affect the function of the interchange.

Section 6 of the IAMP contains action items to improve and maintain interchange operations. These items include roadway improvements, access management, traffic control devices, and land use actions. Those that may be relevant to the Helvetia concept planning area are summarized below.

- Washington County and the City of Hillsboro will coordinate with ODOT in the evaluation of any land use actions that would affect the function of the US 26/Cornelius Pass Road interchange facility.

- Cornelius Pass Road is classified as a five-lane arterial. Any change to that classification would require a plan amendment. A funding plan would also be required for the provision of any additional improvements to the interchange necessitated by adding capacity to Cornelius Pass Road.

The Cornelius Pass Road interchange is located approximately 1.4 miles east of the Shute Road/US 26 interchange, which is the primary interchange serving the Helvetia site. While the IAMP planning area only incorporates land within a half-mile of the interchange, land use actions within the Helvetia area could potentially impact the interchange. The IAMP contains the following language that pertained to the Shute Road UGB expansion area, but that may also be relevant to the Helvetia site:

> *"While most of the land Metro considered for inclusion in the UGB is located far away from the IAMP planning area, Metro did include approximately 200 acres located near the intersection of Shute Avenue and Evergreen Road. Should that area be added to the UGB and developed, traffic volumes at the Shute Avenue/Helvetia Road Interchange would increase, which may in turn encourage some traffic to use the Cornelius Pass Road Interchange."*

In order to implement the IAMP, the plan was adopted as an amendment to the Portland-Cannon Beach Junction (US 26) Corridor Plan by the Oregon Transportation Commission. Metro, Washington County, and the City of Hillsboro adopted resolutions of support for the IAMP. In addition, the City of Hillsboro amended its Transportation System Plan to include specific reference to the Cornelius Pass Road IAMP. No amendments to the Washington County Comprehensive Plan were necessary.

5. Jackson School Road Interchange Area Management Plan

State law requires that an interchange area management plan (IAMP) be prepared and adopted prior to construction of a new interchange on a state highway. The Jackson School Road IAMP (February 2004) was developed in response to this requirement for a new interchange at US Highway 26 and Jackson School Road in rural Washington County. The primary purpose for the interchange project was to improve safety conditions by replacing the un-signalized, at-grade intersection with a grade-separated interchange facility. The new interchange was designed to provide adequate capacity and safe operations through the 20-year planning horizon.

The IAMP serves as a management tool to protect the function of the interchange facility by ensuring that future land use decisions do not result in unplanned traffic demand. This is implemented through plan policies and code language amendments that regulate access and land use decisions and coordination in the vicinity of the interchange. The planning process for the IAMP takes into consideration future growth in the nearby urban areas. Section 6 of the IAMP contains a list of action items that will be used to maintain the function of the interchange. Those that may be relevant to the Helvetia concept planning area are summarized below.

- Washington County will coordinate with ODOT in the evaluation of any action (such as a comprehensive plan amendment) that would affect the function of the Jackson School Road Interchange.

- Jackson School Road is designated as a two-lane arterial. Any action that would result in a change of roadway designation will require a funding plan for the provision of improvements to the interchange facility.

- Metro and the City of Hillsboro will coordinate with ODOT in the analysis of future UGB expansions or annexations that could affect the function of the Jackson School Road, Glencoe Road, or Shute Road interchange facilities.

The Helvetia planning area is located approximately two miles east of the Jackson School Road interchange and is therefore outside the IAMP planning area. At the time the IAMP was prepared, Metro was in the process of considering a UGB amendment to include "200 acres for industrial uses near Shute Road and Evergreen Road." The IAMP states that this area, which is now includes the Helvetia concept planning area, will most likely be served by the existing Shute Road interchange with Highway 26. The IAMP also states that the Shute Road interchange should be improved to accommodate urban traffic and future growth in Hillsboro.

The IAMP was adopted by Washington County as an amendment to their Transportation System Plan, and by the Oregon Transportation Commission. The Cities of Hillsboro and North Plains each adopted a Resolution of Support for the IAMP.

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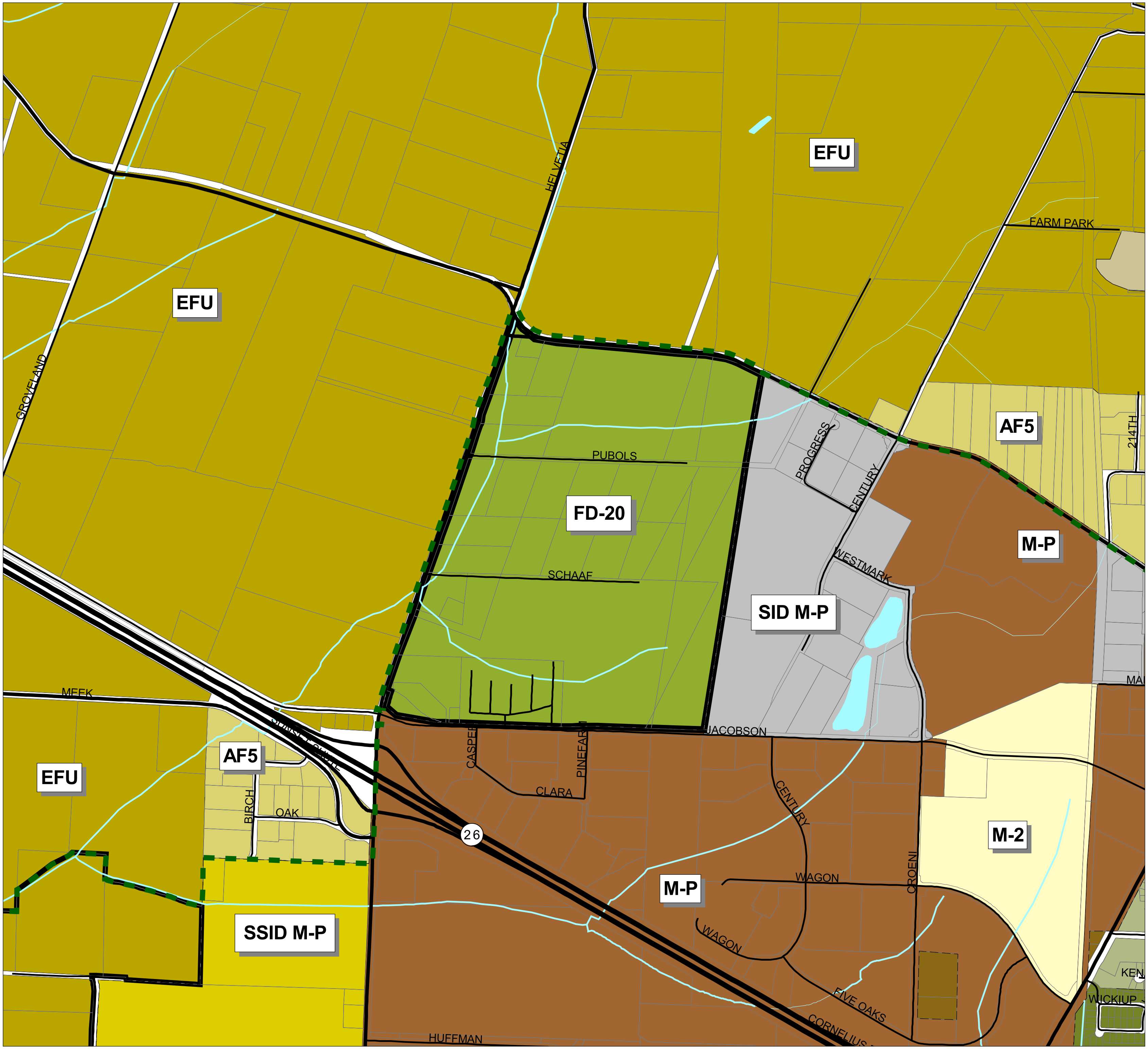
Figure III.1
Helvetia Concept Planning Area Zoning



LEGEND

- Helvetia Concept Planning Area
- UGB
- Tax Lots
- Stream

Streets

- Freeways
- Arterials
- Minor Streets

Washington County Zoning

- FD-20 Future Development - 20 acre*
- AF5 Ag Forestry - 5 acre
- EFU Exclusive Farm Use

City of Hillsboro Zoning

- M-2 Industrial
- M-P Industrial Park
- SID M-P Special Ind Dist Industrial Park
- SSID M-P Shute Road Special Ind Dist Industrial Park

**Effective May 2007*

N

500 0 500 Feet

Angelo Planning Group

Source: RLIS and CH2M Hill
Prepared March 27, 2007

IV. Economic Characteristics

A. Property Ownership Patterns

The purpose of this section is to identify ownership and development patterns in the Helvetia Area in order to inform future planning and development decisions. When evaluating an area's development potential, it is important to identify larger sites, in particular large, vacant sites, because they will be easier to develop upfront.

As shown in Table IV-1, vacant lands comprise an estimated 37 percent (89 acres) of property in the Helvetia Area. Forty-six percent (109 acres) of property is improved, primarily with single-family residences and farm structures. For the purpose of this analysis, undeveloped property that is encumbered by utility easements or other restrictive covenants that significantly limit development potential is not classified as vacant. Accordingly, 40 acres of undeveloped property along the eastern edge of the Area's boundary within the Bonneville Power Administration's easement is not included in the vacant lands inventory.

While most existing development occupies only a limited portion of each parcel, a 15-acre property on the southern edge of Helvetia's boundary is more intensively developed as a mobile home park. Approximately 25 percent of improved properties in the Helvetia Area are small- to medium-size lots less than 10 acres with limited development, while 12 percent are larger lots of 10 acres or more with limited development.

A map of vacant lands within the Helvetia Area is provided in Figure IV.1.

Table IV-1: Helvetia Area Development Patterns

	Total Acres	% of Total
Total	239	100%
Total Improved	109	46%
Small to Medium Lot - Limited Development	66	28%
Large Lot - Limited Development	29	12%
Large Lot - Significant Development	15	6%
Vacant	89	37%
Bonneville Power Administration Easement	40	17%

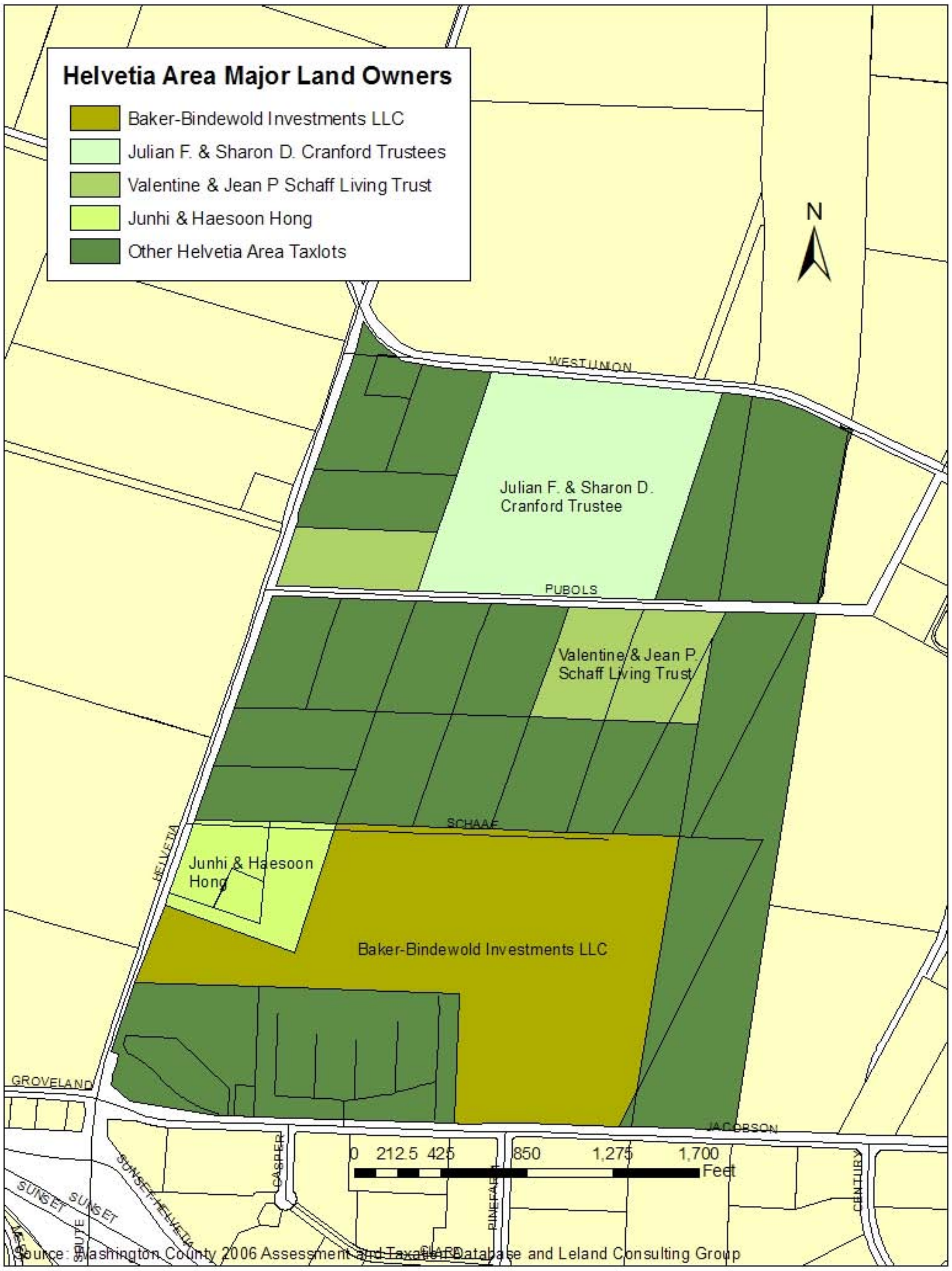
Source: Washington County 2006 Assessment and Taxation database and Leland Consulting Group.

An estimated 105 acres (44 percent) of property in the Helvetia Area is owned by four property owners with 10 or more acres of land (see Appendix B).

Major landowners in the Helvetia Area are identified in Figure IV.1. Two large lots over 25 acres in size are owned by Baker-Bindewold Investments LLC and Julian F. & Sharon D. Cranford Trustees and have significant development potential. The 51-acre Baker-Bindewold property is vacant and the 29-acre Cranford property is largely undeveloped, with a farm structure near the northern boundary of the property and the remainder of the property in agricultural use.

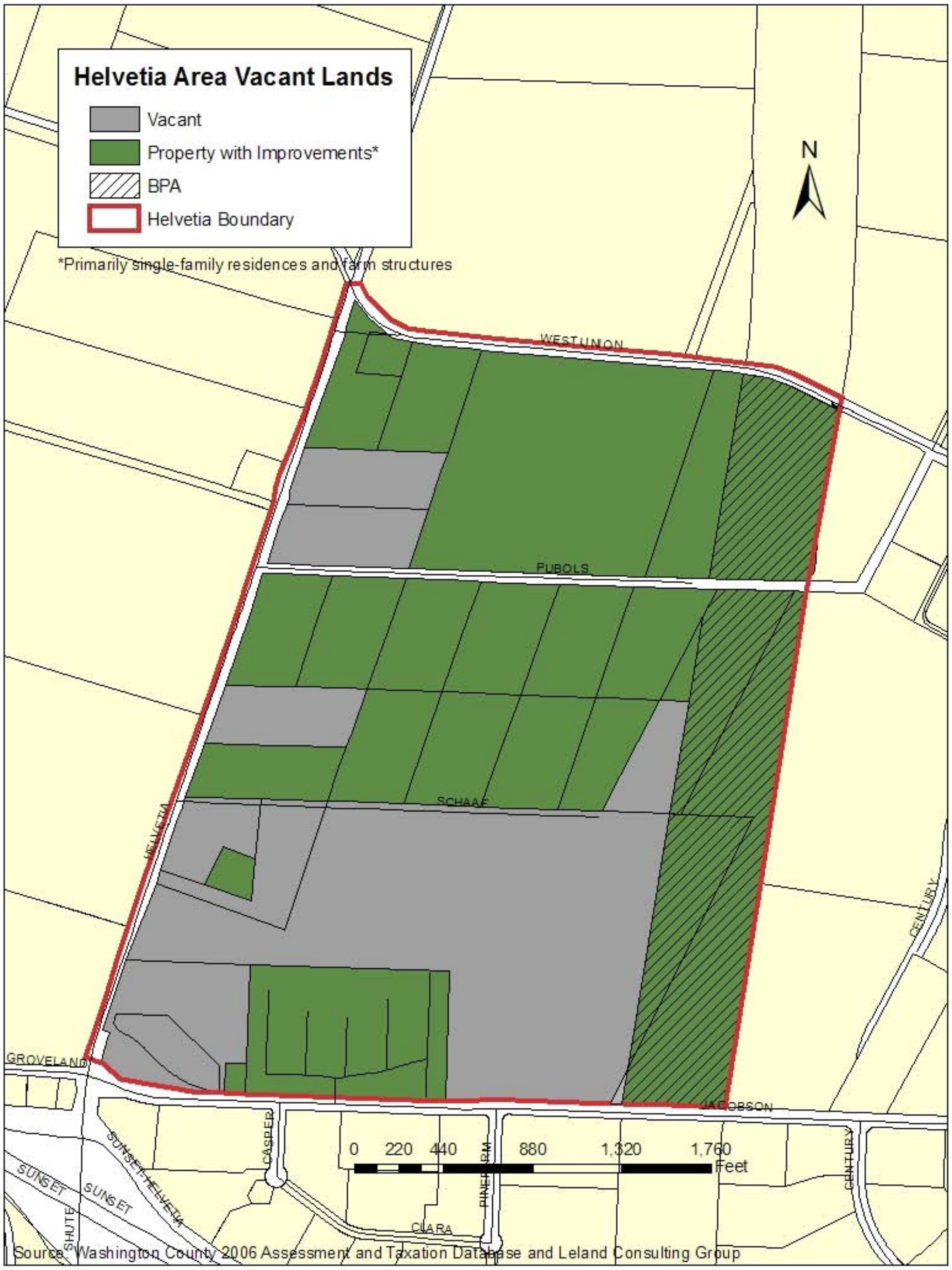
A map of vacant lands within the Helvetia Area is provided in Figure IV.2.

Figure IV.1: Helvetia Area Major Landowners



Source: Washington County 2006 Assessment and Taxation Database and Leland Consulting Group.

Figure IV.2: Helvetia Area Vacant Lands



Source: Washington County 2006 Assessment and Taxation Database and Leland Consulting Group.

Findings:

- Approximately one-third of the Helvetia Area's total acreage (79 acres) is contained within two large properties owned by Baker-Bindewold Investments LLC and Julian F. and Sharon D. Cranford Trustees.

- An estimated 40 acres of property on the eastern edge of the Area is within the Bonneville Power Administration easement. Consequently, no significant development can occur within the easement, although the property may be used for public improvements such as parks and open space or storm drainage facilities.
- Vacant lands (not including the BPA Easement) comprise only 37 percent of the Helvetia Area's total land area. Although it is nearly 300 acres smaller than the Evergreen Area, the Helvetia Area has a larger residential population. This indicates that outreach, education and collaboration with residents will be a key component of the planning process.

B. Demographics

This section provides an overview of key demographic characteristics of communities that will be impacted by future development in the Evergreen and Helvetia Areas, including population and employment data. Assuming both Areas will be developed as industrial or employment lands in the future, the majority of workers will commute from Hillsboro, Washington County and other locations within the Portland Metropolitan Statistical Area (MSA). For statistical purposes, the Portland MSA is comprised of Clackamas, Columbia, Multnomah, Washington, and Yamhill Counties in Oregon as well as Clark and Skamania Counties in Washington.

1. Population and Household Characteristics

Population and Households

According to population estimates produced by ESRI Business Analyst based on 2000 Census of Population and Housing data, an estimated 352 persons and 125 households lived in the Evergreen and Helvetia Areas in 2006. Approximately 79 households and nearly two thirds of the population (224 persons) reside in the Helvetia Area, which contains a densely populated mobile home park. With an estimated 46 households and 128 persons in 2006, the Evergreen Area has a smaller residential population than the Helvetia Area.

Table IV-2 identifies 2000 Census population figures and 2006 population estimates for Hillsboro, Washington County and the 6-County Portland Metropolitan Statistical Area, which includes Clackamas, Columbia, Multnomah, Washington and Yamhill Counties in Oregon and Clark County, Washington.

Table IV-2: Population Growth, 2000 to 2006

Geography	Census 2000	2006 Estimate	Percent Change 2000-2006
City of Hillsboro, OR	70,186	84,445	20.3%
Washington County, OR	445,342	500,585	12.4%
Portland MSA	1,927,881	2,121,910	10.1%

Source: U.S. Bureau of the Census, 2000 Census of Population and Housing, Portland State University 2006 Population Estimates for Oregon Cities and Counties, State of Washington Office of Financial Management 2006 Population Estimates for Washington Cities and Counties and Leland Consulting Group.

While all three geographies experienced significant growth between 2000 and 2006, Hillsboro's population increase was markedly higher than Washington County's and twice that of the 6-County Metropolitan Area. Relative to other cities such as Portland and Gresham, Hillsboro has experienced a disproportionate share of the Metro Area's employment growth in recent years. Hillsboro's robust population growth reflects the fact that it is more than a bedroom community to Portland and is establishing its own unique identity as a place to live and work.

Table IV-3 identifies Metro 2005 and 2030 Household Estimates for Washington County and the Portland Metro Region, which includes Clackamas, Multnomah and Washington Counties in Oregon and Clark County, Washington.

Table IV-3: Metro 2005 and 2030 Employment Estimates

	2005 Estimate	2030 Estimate	Absolute Change	Percent Change
Washington County	189,925	272,998	83,073	44%
Portland Metro Region	824,955	1,207,876	382,921	46%

Source: Metro and Leland Consulting Group.

Between 2005 and 2030, total households in Washington County and the Portland Metro Region are projected to increase by 44 percent and 46 percent respectively. During this time, the number of households in the region is projected to exceed 1.2 million. Given that household growth in Washington County is anticipated to grow in proportion to the region's household growth, there is likely to be a significant demand for new employment opportunities within the County.

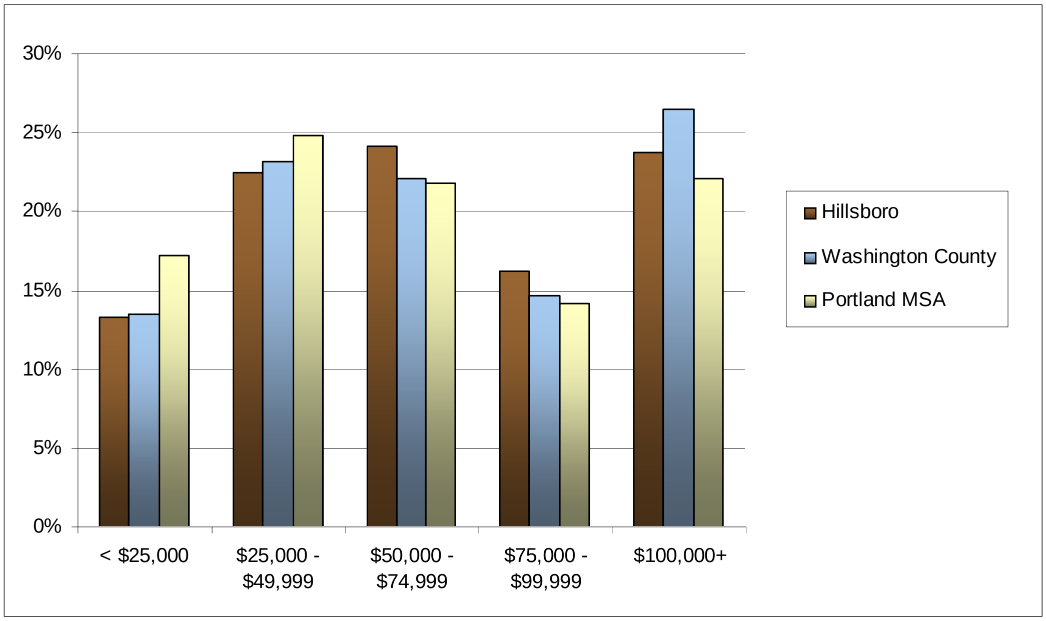
Income

There is a strong correlation between household income and the education and skill levels of workers. For example, the percentage of the adult population with a bachelor's degree or higher is likely to be higher in cities with a high percentage of upper-middle class and upper income households than cities with a predominantly low-income or blue-collar base. Further, more affluent communities are likely to have a high percentage of management- and executive-level workers, which correlates with a strong demand for executive housing.

As shown in Figure IV.3, at 24 percent and 27 percent respectively, Hillsboro and Washington County boast a higher percentage of upper-income households earning $100,000 or more than the Portland Metro Region, where 22 percent of households earned $100,000 or more in 2006. Accordingly, it is not surprising that the percentage of low-income households earning less than $25,000 in Hillsboro (13 percent) and Washington County (14 percent) was notably less than in the Portland MSA, where 17 percent of residents earned less than $25,000 in 2006.

In 2006 the median household income in Hillsboro and Washington County was about $5,500 higher than the median household income for the Portland Metro Area (see Table IV-4.)

Figure IV.3: 2006 Households by Income



Source: U.S. Bureau of the Census, 2000 Census of Population and Housing, ESRI forecasts for 2006 and Leland Consulting Group.

Table IV-4: Household Income Characteristics

	Hillsboro	Washington County	Portland MSA
Median Household Income	$64,318	$64,273	$58,563
Average Household Income	$75,853	$82,579	$75,305
Per Capita Income	$27,300	$31,288	$29,240

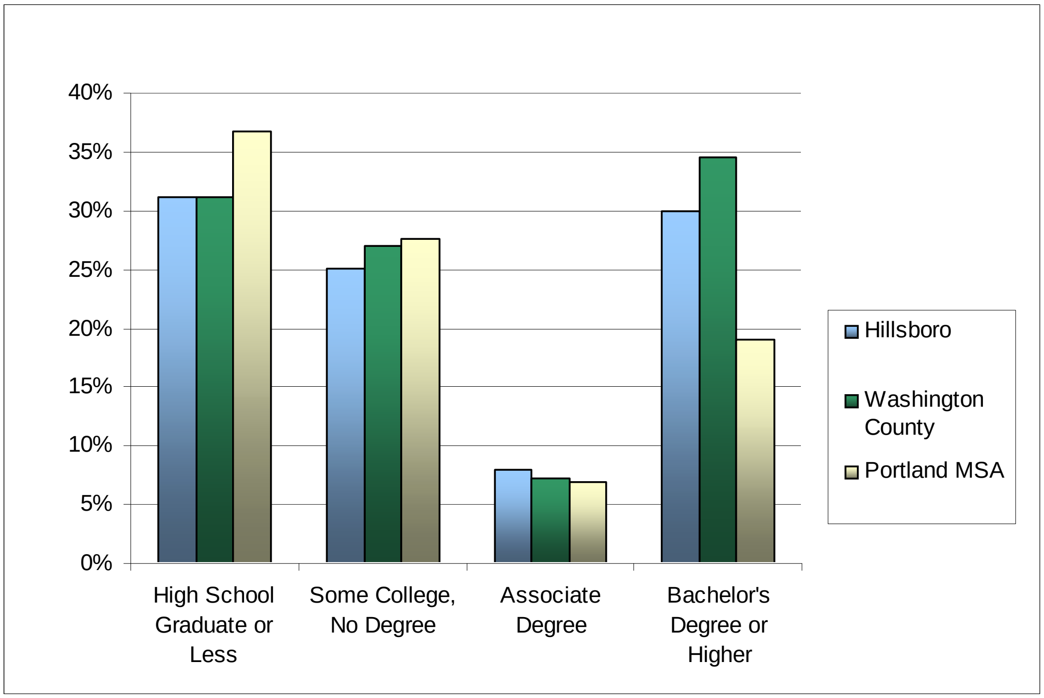
Source: U.S. Bureau of the Census, 2000 Census of Population and Housing, ESRI forecasts for 2006 and Leland Consulting Group.

Educational Attainment

As described above, there is a strong correlation between education and income. Communities with a high level of educational attainment are more likely to attract industries that require advanced training and education than communities with a relatively limited pool of college graduates.

Figure IV.4 below shows the distribution of the population age 25 and older by educational attainment in 2000. Relative to the Portland MSA, where only 29 percent of the population earned a Bachelor's Degree or higher, a greater percentage of the population in Washington County (35 percent) and the City of Hillsboro (30 percent) earned a four-year college degree. This shows that there is an available, well-educated workforce in Hillsboro and Washington County, which makes these places a desirable location for high-tech employers that require a high degree of education, specialized training and management experience.

Figure IV.4: 2000 Educational Attainment



Source: U.S. Bureau of the Census, 2000 Census of Population and Housing and Leland Consulting Group.

Commute to Work

As the Portland MSA's population increases and the urban growth boundary expands to accommodate growth in households and employment, an increasing number of workers are faced with longer commutes to work, including commutes outside their county or state of residence.

In 2000, as shown in Table IV-5, 81 percent of Hillsboro residents age 16 and over worked inside their state and county of residence compared to just 62 percent in Washington County and 72 percent in the Portland MSA. The diversity of employment opportunities in Hillsboro and the relative affordability of housing compared to other cities in the region, such as Portland and Lake Oswego, are factors that likely contribute to its appeal as a place to live and work. Further, as described in the section on population trends, as Hillsboro puts in place the infrastructure and amenities necessary to create a livable community with a unique identity and sense of place, more households are settling there.

Table IV-5: Workers 16+ by Place of Work

	Hillsboro		Washington County		Portland MSA	
	2000 Number	Percent of Total	1990 Number	Percent of Total	1990 Number	Percent of Total
Total	35,797	100.00%	161,994	100.00%	743,796	100.00%
Worked in State of Residence	35,343	98.73%	158,899	98.09%	690,802	92.88%
Worked in County of Residence	28,673	81.13%	98,258	61.84%	496,239	71.84%
Worked outside County of Residence	6,670	18.87%	60,641	38.16%	194,563	28.16%
Worked outside State of Residence	454	1.27%	3,095	1.80%	52,994	7.12%

Source: U.S. Bureau of the Census, 2000 Census of Population and Housing and Leland Consulting Group.

2. Employment Trends

Covered Employment

Table IV-6 below shows 2005 private sector covered employment in Hillsboro, Washington County and the 6-County Portland Metropolitan Area as tabulated by the Oregon Employment Department and the Washington State Employment Security Department. Covered employment refers to a job in which the employer is required by law to report to the state employment department and pay a payroll tax. This tax is used to pay unemployment benefits. A few jobs, such as outside commission sales, real estate sales, certain non-profit organizations, and churches are not covered by unemployment insurance. Covered employment can also include work for local, state, tribal, federal government, military service, or work in another state.

Table IV-7 shows Hillsboro's top 5 industry sectors by total payroll. Table IV-8 shows 2005 covered employment for industrial uses at the 3-Digit NAICS classification level.

Table IV-6: 2005 Covered Employment Summary

Geography	Units	Annual Ave. Employment	Total Payroll ($)
Hillsboro	2,521	52,381	3,087,298,655
Washington County	16,054	221,707	10,487,260,858
Portland Metropolitan Area[1/]	69,253	869,827	35,330,617,929

Source: Oregon Employment Department, Washington State Employment Security Department and Leland Consulting Group.

[1/] Includes Clackamas, Columbia, Multnomah, Washington, and Yamhill Counties in Oregon and Clark County, Washington.

Table IV-7: 2005 Covered Employment by 2-Digit NAICS

Rank	2-Digit NAICS	Description	Units	Annual Ave. Employment	% of Total Payroll
1	31-33	Manufacturing	230	20,999	61%
2	44-45	Retail Trade	324	5,929	5%
3	62	Health Care & Social Assistance	245	3,938	5%
4	51	Information	50	1,475	4%
5	23	Construction	259	2,350	4%
		All Other Industry Sectors	1,457	18,502	21%

Source: Oregon Employment Department, Washington State Employment Security Department and Leland Consulting Group

Table IV-8: 2005 Covered Employment, Industrial Uses by 3-Digit NAICS

3-Digit NAICS	Description	City of Hillsboro Units	City of Hillsboro Annual Avg. Employment	City of Hillsboro % of Total Payroll	Washington County Units	Washington County Annual Avg. Employment	Washington County % of Total Payroll	Portland Metropolitan Area Units	Portland Metropolitan Area Annual Avg. Employment	Portland Metropolitan Area % of Total Payroll
	Construction									
236	Construction of buildings	55	465	1%	579	3,178	2%	2,629	12,800	2%
237	Heavy and civil engineering construction	16	128	0%	105	1,494	1%	504	6,040	1%
238	Specialty trade contractors	188	1,757	2%	1,140	9,533	4%	5,062	38,343	5%
	Manufacturing									
311	Food manufacturing	4	103	0%	40	1,606	1%	265	8,597	1%
312	Beverage and tobacco product manufacturing	n/a	n/a	n/a	15	203	0%	84	1,374	0%
313	Textile mills	n/a	n/a	n/a	1	(c)	(c)	14	333	0%
314	Textile product mills	1	(c)	(c)	9	70	0%	64	767	0%
315	Apparel manufacturing	2	25	0%	13	79	0%	54	590	0%
316	Leather and allied product manufacturing	n/a	n/a	n/a	3	14	0%	18	434	0%
321	Wood product manufacturing	3	69	0%	36	1,676	1%	158	5,594	1%
322	Paper manufacturing	1	(c)	(c)	13	791	0%	54	6,108	1%
323	Printing and related support activities	15	193	0%	69	992	0%	337	5,311	1%
324	Petroleum and coal products manufacturing	n/a	n/a	n/a	n/a	n/a	n/a	12	385	0%
325	Chemical manufacturing	7	71	0%	22	239	0%	123	1,982	0%
326	Plastics and rubber products manufacturing	5	52	0%	37	2,047	1%	138	4,963	1%
327	Nonmetallic mineral product manufacturing	6	279	0%	25	762	0%	131	3,445	0%
331	Primary metal manufacturing	n/a	n/a	n/a	4	61	0%	47	5,894	1%
332	Fabricated metal product manufacturing	42	680	1%	162	2,977	1%	649	12,373	2%
333	Machinery manufacturing	14	866	2%	73	3,595	2%	242	8,238	1%
334	Computer and electronic product manufact	87	17,446	56%	179	26,689	23%	287	36,146	9%
335	Electrical equipment and appliance mfg.	7	222	0%	22	819	0%	51	1,764	0%
336	Transportation equipment manufacturing	4	46	0%	18	484	0%	138	8,954	1%
337	Furniture and related product manufacturing	12	396	0%	54	1,768	1%	269	4,402	0%
339	Miscellaneous manufacturing	20	531	1%	90	1,394	1%	382	5,862	1%
	Wholesale Trade									
423	Merchant wholesalers, durable goods	96	1,405	3%	568	7,983	5%	2,031	26,980	5%
424	Merchant wholesalers, nondurable goods	16	139	0%	149	8,022	7%	897	21,881	4%
425	Electronic markets and agents and broker	84	331	1%	939	2,562	2%	2,991	7,803	2%
	Transportation, warehousing and utilities									
221	Utilities	1	(c)	(c)	6	202	0%	65	2,266	1%
481	Air transportation	11	97	0%	13	98	0%	53	3,671	0%
483	Water transportation	n/a	n/a	n/a	1	20	0%	9	145	0%
484	Truck transportation	20	139	0%	123	1,394	1%	764	11,003	1%
485	Transit and ground passenger transportation	3	12	0%	20	442	0%	115	2,489	0%
486		n/a	n/a	n/a	n/a	n/a	n/a	1	8	0%
487	Scenic and sightseeing transportation	n/a	n/a	n/a	3	6	0%	11	343	0%
488	Support activities for transportation	16	245	0%	64	666	0%	411	5,710	1%
491	Postal servicee	n/a	n/a	n/a	n/a	n/a	n/a	5	52	0%
492	Couriers and messengers	2	20	0%	26	1,138	0%	127	4,806	1%
493	Warehousing and storage	3	2	0%	16	260	0%	131	4,100	1%
	Information									
511	Publishing industries, except Internet	26	1,045	4%	172	3,477	3%	531	9,010	2%
512	Motion picture and sound recording industries	3	81	0%	27	290	0%	186	1,826	0%
515	Broadcasting, except Internet	2	23	0%	5	230	0%	49	1,822	0%
516	Internet publishing and broadcasting	n/a	n/a	n/a	11	35	0%	39	119	0%
517	Telecommunications	13	285	1%	71	1,850	1%	258	7,042	1%
518	ISPs, search portals, and data processing	5	39	0%	61	842	0%	209	3,205	1%
519	Other information services	1	(c)	(c)	5	116	0%	16	191	0%

Source: Oregon Employment Department, Washington State Employment Security Department and Leland Consulting Group.

In 2005, as shown in Table IV-7, Hillsboro's average annual covered employment was 52,381, approximately 24 percent of average annual employment in Washington County and 6 percent of average annual employment in the Portland Metro Area. As shown in Table IV-8, employment in the Manufacturing industry sector accounted for an estimated 61 percent of Hillsboro's covered payroll ($1.9 billion) in 2005. The industry sector with the second highest annual payroll, Retail Trade, accounted for only 5 percent of gross payroll receipts ($147 million).

Among industry sectors where industrial uses are predominant, including the Construction, Manufacturing, Wholesale Trade, Transportation, Warehousing and Utilities, and Information industries, payroll in three industry sub sectors exceeded $100 million within the City of Hillsboro (see Table IV-9). Hillsboro's industrial economy is fueled by companies such as Intel and Sun Microsystems that specialize in computer and electronic product manufacturing (NAICS 334). In 2005, this industry sub sector consisted of 87 firms with an average annual employment of 17,446 and a total payroll of $1.7 billion or 56 percent of Hillsboro's total annual payroll. Within the wholesale trade sector, merchant wholesalers specializing in durable goods (NAICS 423) employed an average of 1,405 persons with a total payroll of around $101 million or 4 percent of Hillsboro's total annual payroll. Within the Information sector, publishing industries employed an average of 1,045 persons with a total payroll of around $110 million or 3 percent of Hillsboro's total annual payroll.

Metro Employment Estimates

Table IV-9 below shows Metro 2005 and 2030 employment estimates for Washington County and the Portland Metro Region.

Table IV-9: 2005 Covered Employment, Industrial Uses by 3-Digit NAICS

	2005 Estimate	2030 Estimate	Absolute Change	Percent Change
Washington County	269,660	450,970	181,310	67%
Portland Metro Region	1,075,877	1,758,330	682,452	63%

Source: Metro and Leland Consulting Group.

Between 2005 and 2030, Washington County and the 4-County Metro Area are projected to experience significant job growth. A disproportionate share of employment growth is anticipated to occur in the service sector, particularly in Washington County, where the number of service jobs is projected to increase by 126 percent.

Major Employers

Currently, as shown in Table IV-10, 18 companies employing 200 or more workers are located within the City of Hillsboro. In addition to several large, high-tech manufacturing employers, major healthcare facilities and customer service call centers are located in Hillsboro.

Table IV-10: Hillsboro Major Employers

Employer	Business Product/Service	Employees
Intel	Semiconductor integrated circuits	15,500
Wells Fargo	Customer Service Call Center	1,700
Tuality Health Care	Healthcare	1,200
ConvergysCorporation	Customer service call center	544
Sun Microsystems	Computer electronics & support systems	530
Credence Systems Corp	Provider of design-to-test solutions for the global semiconductor industry	480
Triquint Semiconductor Inc	Supplies high performance modules and components for the communications industry.	400
RadiSys Corporation	Provider of advanced embedded solutions used in commercial, enterprise, and serivce provider systems markets.	411
FEI Company	Focused ion and electron-beam technologies deliver 3D characterization, analysis and modification capabilities with resolution down to the sub-Angstrom level.	375
Masterbrand Cabinets Inc.	Custom cabinets	365
Lattice Semiconductor Corporation	Designs, develops and markets high performance programmable logic devices, or PLDs, and related software.	356
Epson Portland Inc	Ink cartridge manufacturing	350
ACS Inc	Business process and information technology services provider	332
Planar Systems Inc	Flat panel display provider for the industrial, medical, commercial, and consumer markets	265
Corillian Corp	Provides highly scalable and secure Internet banking applications	270
Tokyo Electron America	Sales & Service for semiconductor equipment	220
Integrated Device Technology Inc	Semiconductor devices	200
V W Credit Inc	Customer Service Call Center	200

Source: City of Hillsboro Economic Development Department and Leland Consulting Group.

C. Real Estate Market Conditions and Factors

1. Industrial Market

According to interviewed real estate professionals, sales of industrial land in the Sunset Corridor have been slow. Currently, industrial land is selling for around $6.00 per square foot. Aside from Genentech's recent purchase of approximately 80 acres of land adjacent to the Evergreen Area and SolarWorld's acquisition of the old Komatsu facility, there have been relatively few land transactions.

The majority of existing industrial users on the Westside are within the high-tech cluster. However, investments by companies such as Genentech and SolarWorld, both of which will open new facilities in Hillsboro during the next couple of years, have increased interest and speculation with regard to the City's potential to attract biosciences and sustainable industries firms. Local real estate and economic development experts generally agree that the Evergreen and Helvetia Areas are most likely to accommodate growth in the high-tech and semiconductor industries and sustainable industries. Distribution and Logistics facilities are unlikely to locate to the Areas because they are not close enough to a major freeway and there are more suitable locations in the region for these facilities.

Table IV-11 below shows vacancy, absorption and average rental rates in the Portland metro area by industrial market sector, as reported by Colliers International. The Evergreen and Helvetia Areas are located in the Westside market sector and the Beaverton/Hillsboro sub-market.

Table IV-11: Vacancy, Absorption and New Construction by Industrial Market Sector

	Inventory (SF)	Vacant SF	4Q Vacancy	2006 Absorption	Average Annual Rental Rate
Central	9,976,388	1,237,318	12.4%	207,196	$6.90
Westside	55,810,084	5,441,750	9.8%	1,264,704	$6.55
North/Northeast	40,872,513	2,829,584	6.9%	2,183,318	$4.67
Southeast	16,573,547	1,687,726	10.2%	432,366	$4.51
Clark County	13,075,220	921,594	7.0%	384,936	$5.08
Outlying	15,535,621	2,440,668	15.7%	(284,009)	$6.38
Total Metro	151,843,373	14,558,640	9.6%	4,188,511	$5.85

Source: Colliers International 4th Quarter Portland Industrial Market Report and Leland Consulting Group.

Detailed industrial statistics for the Westside Market Sector are shown in Table IV-12.

Table IV-12: Westside Industrial Sub-Market Characteristics

Sub-market	Buildings	Inventory (SF)	Total Vacant SF	4Q 2006 Vacancy	2006 Absorption	Average Annual Rental Rate	Average Sales Price Per SF
NW/Guilds Lake	186	8,887,221	363,044	4.1%	20,702	$4.48	n/a
Beaverton/Hillsboro	447	26,745,882	3,690,585	13.8%	98,213	$7.18	$49.04
I-5 South	424	20,176,981	1,388,121	6.9%	1,145,789	$5.40	$68.74
Westside Total	**1,057**	**55,810,084**	**5,441,750**	**9.8%**	**1,264,704**	**$6.55**	**$62.03**

Source: Colliers International 4th Quarter Portland Industrial Market Report and Leland Consulting Group.

Findings:

- At 13.8 percent, the fourth quarter vacancy rate in the Beaverton/Hillsboro sub-market was significantly higher than the overall vacancy rate for the Westside (9.8 percent) and the metro area, which had an overall vacancy rate of 9.6 percent.
- However, despite its higher vacancy rate, the Beaverton/Hillsboro sub-market achieved the highest average annual rental rates on the Westside - $7.18 per square foot compared to $6.55 per square foot for all Westside sub-markets. Further, the Beaverton/Hillsboro submarket achieved a higher average annual rent than the metro area as a whole, where the average rental rate was $5.85 in 2006.
- Total net annual absorption of industrial space in the metro area was 4,188,511 square feet in 2006. An estimated 1.3 million square feet of industrial space, or 30 percent of the metro area's total net annual absorption, was absorbed on the Westside.

2. Office Market

Table IV-13 below shows 2006 general office statistics for the Portland Office Market published by Colliers International. The Portland Office Market consists of six sub-markets. The Westside sub-market encompasses office development in several areas, including Highway 217, Washington Square, the southwest portion of the Portland metro area, Sylvan and the Sunset Corridor, where the Evergreen and Helvetia Areas are located.

Table IV-13: 2006 Office Statistics, Portland Office Market

	Inventory (SF)	Vacancy	2006 Absorption	Average Quoted Rent
All Classes	**62,142,717**	**11.7%**	**721,722**	**$18.61**
Central City	27,283,524	11.3%	394,027	$18.87
Suburban	34,859,524	11.9%	327,695	$18.42

Source: Colliers International 4th Quarter Portland Office Market Report and Leland Consulting Group.

Detailed office statistics for the Westside sub-market are shown in Table IV-14 below.

Table IV-14: Westside Submarket Office Statistics

	Buildings	Inventory (SF)	2006 Vacancy	2006 Absorption	Average Annual Rental Rate	Average Sales Price Per SF
Class A	46	6,563,849	7.9%	(21,415)	$19.70	n/a
Class B	176	6,725,893	16.5%	147,167	$16.98	$189.78
Class C	69	1,541,943	13.6%	58,191	$14.62	$222.37
Westside Total	**291**	**14,831,685**	**12.4%**	**183,943**	**$17.48**	**$198.37**

Source: Colliers International 4th Quarter Portland Office Market Report and Leland Consulting Group.

Findings:

- At 12.4 percent, the 2006 vacancy rate for all classes of office space in the Westside sub-market was only slightly higher than the fourth quarter vacancy rate for the metro area (11.9 percent). In recent years, office vacancy on the Westside and, in particular, in the Sunset Corridor, has decreased as the market gradually recovers from the economic recession that occurred in the early 2000s.

- An estimated 25 percent of the metro area's total net annual absorption of office space occurred in the Westside sub-market in 2006.
- At $17.48 per square foot, the average annual rent for office space in the Westside sub-market was nearly a dollar less than the average quoted per square foot rent for the broader suburban market ($18.42) in 2006.

V. Public Infrastructure

A. Sanitary Sewer System

The existing sanitary sewer system in the Helvetia concept planning area includes a 10-inch and 12-inch sanitary sewer conveyance line adjacent to the east border of the Helvetia Planning Area (Figure V.1). It appears a major portion of the Helvetia area is excluded from the City of Hillsboro sanitary plant boundary limits. Therefore, it is assumed that the existing sanitary sewer would not be available or have the capacity to serve the Helvetia concept planning area. No sanitary sewer service mains have been identified along NW Jacobson Road to the south, Helvetia Road to the west, or West Union Road to the north. Appears new sanitary sewer services will need to be provided to support the Helvetia Planning Area.

Clean Water Services is the public utility responsible for providing wastewater and stormwater services in the Tualatin River Watershed. The primary regulatory driver for sanitary sewer is Clean Water Services and their Design and Construction Standards. These standards regulate the design, conveyance, and installation of sanitary sewer within the Washington County UGB. The current standards were published in March 2004; however, these are currently in the revision process. These revisions have been in process for nearly a year and the public comment process closed in March, 2007. The adoption date for the revised standards is anticipated for summer of 2007. Therefore, the draft revisions are the appropriate standards through which future development requirements will be evaluated.

B. Water System

There is currently a water distribution network adjacent to the east and south sides of the Helvetia concept planning area (Figure V.2). The existing 24-inch service main along NW Jacobson Road to the south would most likely be used to serve development in the Helvetia area. No water distribution service mains have been identified along Helvetia to the west or West Union Road to the north. However, the 12-inch existing service main located along West Union Road that terminates east of the Helvetia Planning Area may be extended to serve the area from the north. This line could then be extended south along Helvetia Road and connected to the 24-inch main along NW Jacobson Road to provide a looped system to service the area from all sides.

The primary regulatory driver for water distribution network is Tualatin Valley Water District and their Water System Standards. These standards regulate the design and installation of water distribution within the Tualatin Valley Water District. The current standards were published in March 2002.

C. Stormwater System

This section reviews the stormwater conditions in the Helvetia Planning Area. The Helvetia area is flat to gently sloping and populated primarily with hydrologic group C and D soils. These soils have relatively low rates of infiltration and high runoff potential, particularly when wet. Average annual precipitation is on the order of 40-inches per year, with the majority of precipitation falling during the winter months.

There is currently no stormwater conveyance system within the Helvetia concept planning area with the exception of a discharge from the Jacobson Road stormwater system to the southern drainage swale in the planning area (Figure V.3). A 12-inch diameter storm system currently serving the south side NW Jacobson Road discharges to Wiable Gulch at Jacobson and Helvetia Road. The north side of Jacobson Road is not curbed and is served by a roadside drainage ditch. Helvetia Road, along the west side of the planning area, is served by roadside ditches that discharge in to Wiable Gulch. West Union Road along the north side of the planning area is also served by roadside ditches draining into Wiable Gulch or its tributary.

The primary regulatory driver for stormwater management is Clean Water Services and their Design and Construction Standards. These standards regulate the conveyance, detention and water quality treatment of stormwater with the Washington County UGB. The current standards were published in March 2004; however, these are currently in the revision process. These revisions have been in process for nearly a year and the public comment process closed in March, 2007. The adoption date for the revised standards is anticipated for summer of 2007. Therefore, we believe the draft revisions are the appropriate standards through which we should evaluate future development requirements. The draft standards require stormwater quality treatment for all impervious area created by the development, whether it is new or re-developed impervious area. Stormwater treatment is required for the first 0.36-inchs of precipitation over a 4-hour period.

The draft standards also allow the use of Low Impact Development (LID) techniques in concert with traditional quality and quantity control methods. LID techniques can be used to provide quality treatment and reduce the requirements for quantity control. The inclusion of LID techniques in the Design and Construction Standards are new to the draft standards and are not included in the current standards.

Quantity control, or detention, is required when there is an identified downstream deficiency. The discharger can either be required to improve the downstream conveyance system to eliminate the downstream deficiency or provide detention to prevent an increase in peak runoff rates for the 2, 10, and 25-year discharges. There is currently extensive flooding of Waible Gulch in the Helvetia area; therefore, it is reasonable to assume that quantity control will be required for the creation of new impervious area.

The draft standards require stormwater conveyance for the 25-year build-out flow. All public storm systems components that are located in private rights-of-way will require easements granted to Clean Water Services. This is inclusive of pipes and management facilities.

A potential additional regulatory driver for stormwater in the Helvetia concept planning area is the Endangered Species Act. If a federal nexus exists in the permitting of any development within the Helvetia planning area, stormwater management guidelines promulgated by the National Marine Fisheries Service (NMFS) could be required. These guidelines could potentially increase the requirements for stormwater management. NMFS guidelines specify water quality treatment for 72-percent of the 2-year, 24-hour storm, or

1.80-inches I 24 hours. Detention is to be provided for ½ of the 2-year, 24-hour event through the 50-year, 24-hour event. Providing facilities to meet these standards will require greater commitment of area a resources than those required under the Clean Water Services standards.

D. *Private Utilities*

1. Portland General Electric

Electric power is supplied to the planning area by Portland General Electric (PGE). PGE's Sunset Reliability Center is a power substation designed and built to meet the requirements of several semiconductor fabrication facilities in the area, including Intel's Ronler Acres site, and other high tech customers in the vicinity. The power substation is located at 235th and Evergreen. PGE is also planning to build a technology enhanced substation on approximately 10 acres within the Evergreen concept planning area. This substation will be configured in a manner similar to PGE's existing Sunset substation.[11]

2. NW Natural Gas

NW Natural Gas is the natural gas provider to the planning area.

3. Communications

Communications companies serving the area include Qwest and Verizon (telephone) and Comcast (digital phone, cable and broadband services).

4. Bonneville Power Administration

An existing Bonneville Power Administration (BPA) high-voltage transmission line runs in the north-south direction through the eastern portion of the Helvetia concept planning area (Figure V.4). The routing is approximately 425 feet west of the eastern border of the area and is within a 500-foot wide public utility easement. The eastern boundary of the easement also aligns with the eastern border of the Helvetia planning area. Development within the eastern 500 feet of the area is limited. The transmission line falls within a public utility easement and, therefore, development within and adjacent to the transmission line must be in accordance with BPA criteria and standards. Criteria pertaining to vertical and horizontal clearances, acceptable structures that may fall within the easement, and construction within the easement will restrict development in this area.

[11] April 19, 2007 Memo from PGE System Planning Department regarding Evergreen UGB Expansion Area Vision.

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Figure V.1

Sanitary Utilities from the City of Hillsboro

Helvetia UGB Concept Plan

LEGEND

- Helvetia Site (Planning Area = 242.12 ac)
- UGB
- Roads
- Tax Lots

City of Hillsboro Sanitary Utilities

- Manhole
- Cleanout
- Pump Station
- Gravity Mainline
- Stub Out
- Forces
- Dry Line
- Abandoned Mainline
- Lateral
- Sanitary Plant Boundary

N

0 500 1,000
Feet

Angelo planning group

CH2MHILL

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Figure V.2

Utilities from the Tualatin Valley Water District

Helvetia UGB Concept Plan

LEGEND

- Helvetia Site (Planning Area = 242.12 ac)
- UGB
- Roads
- Tax Lots

TVWD Utilities

- Fire Flow Point
- Commercial Backflow
- Hydrant
- Fitting
- Meter
- Regulator
- BF Valve
- B Valve
- G Valve
- Fire Service Line
- Service Lateral
- Water Line

N

0 500 1,000

Feet

Angelo planning group

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Figure V.3

Stormwater Utilities from the City of Hillsboro

Helvetia UGB Concept Plan

LEGEND

- Helvetia Site (Planning Area = 242.12 ac)
- UGB
- Roads
- Tax Lots

City of Hillsboro Stormwater Utilities

- Manhole
- Catch Basin
- Cleanout
- Inlet
- OF
- Water Quality Facility
- Active Mainline
- Abandoned Mainline
- Private Active Mainline
- Structure Lateral
- Service Lateral
- Private Lateral

N

0 500 1,000

Feet

Angelo planning group

CH2MHILL

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Figure V.4

BPA Transmission Lines

Helvetia UGB Concept Plan

LEGEND

- BPA Transmission Line
- Helvetia Site (Planning Area = 242.12 ac)
- UGB
- Roads
- Tax Lots

N

0 500 1,000

Feet

Angelo planning group

CH2MHILL

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VI. Public Facilities

A. Parks

There are currently no public parks or designated public open spaces within the Helvetia planning area. The City of Hillsboro Parks and Recreation District will serve this area once land is incorporated into the city, after annexation.

B. Schools

The Helvetia area is within the Hillsboro School District. There are no public schools within the Helvetia planning area. The West Union Elementary School, 23870 NW West Union Rd North, lies to the northeast of the concept planning area. This area is within the West Union Elementary School, Evergreen Middle School, and Liberty High School service boundaries.

C. Fire

There are currently no public service facilities within the Helvetia planning area. Through an intergovernmental agreement with Washington County, the City of Hillsboro's Fire and Rescue serves the area. The nearest fire station is the Ronler Acres Fire Station, Station 3, located at 4455 NW 229th Avenue. Staffed by a 9-person company, Station 3 serves Hillsboro's high-tech area and is equipped to handle associated hazardous materials emergencies.[12]

D. Police

There are currently no public service facilities within the Helvetia planning area. Through an intergovernmental agreement with Washington County, the City of Hillsboro's Police Department serves the Helvetia area.

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[12] See Hillsboro Fire and Rescue, http://www.ci.hillsboro.or.us/Fire/103.aspx

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VII. Natural Resources

The following overview provides a guide to natural resources planning in the Helvetia concept planning area. Figure VII.1 provides an orientation to the significant natural resources in the vicinity of the Evergreen area. The focus of this section is on generalized natural features and related regulatory information. The information is intended as an initial overview based upon published information and does not reflect observations from site survey. Natural features characterizations could change as supplemental data and field information become available. For a more complete preliminary list of natural features in the Helvetia area and the regulatory framework applicable to concept planning for Helvetia see Appendix B, *Natural Resources Report*.

A. Natural Features

Defining the natural landscape in the Evergreen area is the Lower McKay Creek streamshed. Two tributaries to Waible Gulch, a tributary of McKay Creek., cross the planning area; both tributaries flow directly to Waible Gulch at the western edge of the planning area. The topography of the site is gently sloping to rolling, ranging from about 255 feet elevation in the eastern portion of the planning area to about 185 feet at the Waible Gulch floodplain to the west. Natural features and environmental constraints identified in the 249-acre Helvetia concept planning area include riparian corridors, wetlands, floodplains, groundwater resources, and natural areas.

1. Groundwater Hydrology

Most rainfall infiltrates the soil mantle in the Helvetia area. The amount of impervious surface area is relatively low. Surface runoff mostly occurs during storms, and then only at low elevations. Infiltrated water enters a dynamic soil storage zone that meters out the steady downslope movement of water. The amount of water stored in soil affects the volume and duration of flow discharged to surface waters.

Shallow groundwater is present at varying soil depths, and varies by season and rainfall. Agricultural and rural residential land uses probably altered groundwater quantity and quality through ditching and tiling.

Currently, there is no local groundwater program. In the Tualatin Basin, the general hydrogeologic units consist of the Lower Sedimentary Unit, which overlies the Columbia River Basalt and the Basement Confining units (USGS 2005). (See Appendix B for characteristics of hydrogeologic units.)

2. Soils

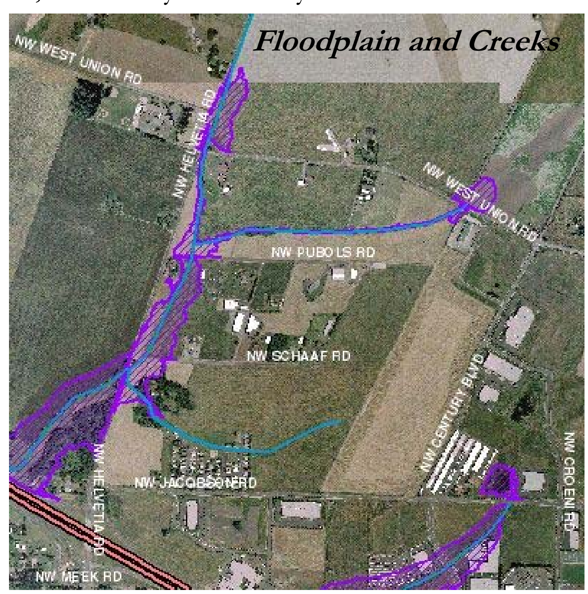
The presence and distribution of soil types at the planning area suggest that lands are best suited to certain uses, or limited by slope steepness, erosion hazard, or other factors. According to the Soil Survey of Washington County, soil types range from silt loam and silty clay loam along lowland drainages to silt loam on adjacent higher areas; correspondingly, lowlands are characterized by frequent flooding, low productivity, and severe limitation for building site development; uplands have no flooding, high productivity, and moderate to severe limitations for building site development.

- Lowland soils along Waible Gulch and its two tributary drainages on the Helvetia planning area are primarily Dayton silt loam, or Cove or Verboort silty clay loams.
- Soils on adjacent uplands are Amity, Willamette, or Woodburn silt loams
- Steep slopes:
- No surfaces with greater than 25% slope are found within the study area (Figure VII .4)
- Erosion hazard is:
  - Moderate to slight at Willamette and Woodburn silt loams
  - Slight at all other soil units in the planning area

3. Floodplain

The Helvetia area is flat to gently sloping and populated primarily with hydrologic group C and D soils. These soils have relatively low rates of infiltration and high runoff potential, particularly when wet. Average annual precipitation is on the order of 40-inches per year, with the majority of precipitation falling during the winter months.

The major stream in the Helvetia area is Waible Gulch, a tributary of McKay Creek. Waible Gulch runs north to south near the east side of Helvetia Road, crossing under Helvetia Road near the south end of the planning area. It is mapped as a FEMA Zone A floodplain. A Zone A floodplain is an approximate area of flooding during the 1-percent or 100-yerar annual recurrence event. This area is not included in the detailed floodplain study and no base flood (100-year) elevations or flood hazard factors have been determined. Clean Water Services' "Watershed 2000" study predicts that 100-year flows in the McKay Creek area over the next 40 years will increase by 0.6-percent. To determine the actual extent of the Wiable Gulch floodplain in the planning area a hydrologic and hydraulic analysis would be required prior to any design work.



Two other drainages are tributary to Waible Gulch in the planning area. Both drainages flow from east to west, one along the north side of the planning area and the other along the south side.

Clean Water Services standards, both current and proposed (see Section V., Public Infrastructure, Sanitary Sewer System and Stormwater System subsections in this report), require no net fill within a FEMA floodplain. To determine the actual extent of the floodplain in the planning area a hydrologic and hydraulic analysis would be required prior to any design work. The flows and extent of flooding in the two east to west drainages should also be determined through hydrologic and hydraulic analysis.

Waible Gulch looking north from Schaaf Road

B. Regulatory Framework

1. Washington County Comprehensive Plan

Washington County has identified significant natural resources in the planning area. These are shown on the County's Rural/Natural Resources Plan Significant Natural Resources map (mapped natural features are approximate, subject to refinement of boundaries through site assessment) (see Figure VII.2) and include the following:

- Water Area and Wetlands & Fish and Wildlife Habitat—Water areas and wetlands (i.e., 100-year floodplain, drainage hazard areas, and ponds) that are also fish and wildlife habitat:
- Waible Gulch, including its floodplain and riparian corridor along the western boundary of the planning area
- Tributary to Waible Gulch including its floodplain and riparian corridor north of NW Pubols Road
- Water Area and Wetlands—100-year floodplain, drainage hazard areas, and ponds, except those already developed:
    - Along western edge of planning area, associated with Waible Gulch drainage.
    - Along western portion of north tributary to Waible Gulch
- No other natural features are identified on the resources map

2. Clean Water Services

Clean Water Services, in partnership with local jurisdictions and the watershed community, manages the surface water system of the urban portion of the Tualatin River Basin. The *Healthy Streams Action Plan* identifies policy and program refinements, as well as surface water and stormwater projects to be funded through CWS' capital improvement program to improve water quality, water quantity management, and aquatic species habitat. The Healthy Streams Plan articulates the latest scientific information related to watershed and stream management, and identifies and prioritizes projects and activities that could be implemented to further improve regional water resources management. For example, the plan proposes three types of stream health improvement projects in the Lower McKay Creek Watershed:

- Flow Restoration project at McKay Creek near Glencoe and Zion Church Road;
- Community Tree Planting Challenge projects along Waible Gulch and tributaries;
- Four Culvert and Weir Retrofit projects at Waible Gulch and tributaries.

The Healthy Streams' *Environmental Data and Analysis* describe current baseline environmental conditions in the watershed. The socioeconomic and scientific data and analysis were used to develop the recommendations in the Action Plan. Detailed methodology, data, and maps are available through the Healthy Streams Plan's electronic Appendices and Internet links provided in the text, all of which is too extensive to be covered in this technical memorandum. Environmental conditions highlighted by the plan are:

Lower McKay Creek: This creek contains high gradient headwaters and low gradient valley bottom stream types. The upper watershed to the headwaters is relatively undisturbed and in good health, where the Effective Impervious Area is only about 0-10%. The lower watershed is more disturbed and in moderately good health. The Effective Impervious Area varies, but is as high as 40% in some areas. Stream flow is relatively healthy with few deficiencies caused by water diversions (typically as low as 0-4 cubic feet per second total diversions). Tree canopy along the creek is high in the upper reaches of the watershed and moderate to high in the lower reaches. Streambed material is typically clay/silt throughout most of the system with areas of bedrock and gravel/cobble in a tributary at North Plains. Large woody debris is deficient in the upper reaches of the watershed, but plentiful in the lower reaches. McKay Creek is used by cutthroat trout for spawning and rearing in the upper reaches and for rearing and migration in the lower reaches; consequently, the fish management priority is for cutthroat trout. The priorities for stormwater management are for both quantity and quality. Base flow management is a high priority for the watershed.

Waible Gulch: This creek contains high gradient headwaters, low gradient headwaters, and low gradient valley bottom types. Stream flow is relatively healthy with few deficiencies caused by water diversions (typically as low as 0-4 cubic feet per second total diversions). Although Effective Impervious area is very low (0-10%), agricultural practices have affected stream quality. Stream quality in the lower watershed and most tributaries is moderately good. Stream quality in upper watershed is moderate. Tree canopy along the creek is variable, with low to very low coverage. Streambed material is typically clay/silt from headwaters to confluence with McKay Creek. Large woody debris is deficient at most stream reaches in the watershed. The lower reach of Waible Gulch is used by cutthroat trout for rearing and migration; consequently, the fish management priority is for cutthroat trout. The priorities for stormwater management are for both quantity and quality. Base flow management is a high priority for this watershed.

The *Sensitive Areas and Vegetated Corridors* program, the District's stormwater management program intends to improve water quality, protect fish habitat and manage drainage by operating and maintaining the stormwater conveyance system, establishing design and construction standards, regulating activities that can impact the watershed and enhancing streams and floodplains. The program regulates development activities in water quality sensitive areas, and in vegetated corridors along waters and wetlands, such as these features in the Helvetia planning area:

- Sensitive Areas include Waible Gulch, Waible Gulch tributaries; existing and created wetlands, ponds, and instream impoundments
- Vegetated Corridors include variable-width buffers adjacent to Sensitive Areas that protect the water quality functions of the water quality Sensitive Area
- Mapped Vegetated Corridors are only estimates. Exact determinations are made on a site at the time of development through the requirements of Clean Water Services' Design and Construction Standards and Washington County Community Development Code. Corridors may be adjusted based on slope, stream size, and status, or site conditions.

3. Tualatin Basin Fish and Wildlife Program

The Tualatin Basin Goal 5 Program is the result of a cooperative effort among Metro, Washington County, CWS, and cities in the Tualatin River Basin to develop a watershed approach that improves urban fish and wildlife habitat. The program is based upon an inventory of regionally significant Goal 5 fish and wildlife habitat conducted by Metro (see Figure VII.3). The basin program was adopted by the specially-formed Tualatin Basin Natural Resources Coordinating Committee in April 2005, by Metro in September 2005, and is pending acknowledgment by LCDL based on a decision made in October 2006. Local jurisdictions are currently in the process of implementing initial program compliance efforts.

The program is non-traditional in the sense that it is based upon cooperative proactive efforts, incentives, and investment rather than on regulation of natural resources areas. Nonetheless, there is a regulatory aspect to the efforts which focuses on allowing and encouraging habitat-friendly development practices and low impact development techniques. The Basin program recognizes that fish and wildlife habitat in riparian resource areas is potentially affected by activities that impact water quality, and that these activities can occur anywhere in the watershed—not just in identified resource areas. The program therefore describes three general categories of land that may occur in the planning area (subject to field delineation) and described below.

- Strictly Limit (SL) is applied to areas where existing protection and conservation measures are already in place which restrict development, consistent with Clean Water Services' standards for Vegetated Corridors (generally 50 feet or wider buffers along streams and 125-foot buffers along the Tualatin River, with requirements for enhancement of degraded conditions).

- Moderately Limit (ML) is applied to Class I and II Riparian resource areas identified in Metro's Goal 5 inventory which fall beyond Vegetated Corridor buffers. For such natural areas, conservation and restoration area encouraged, and the revenue tools the Basin has at its disposal will be directed to help make such conservation and restoration happen. These revenue tools include a $95 million investment with the Partners' plan to spend on stream system improvements over the next 20 years, under the guidance of Clean Water Services' Healthy Streams Plan. Program efforts applicable to the SL and ML areas are intended to protect and improve critical core urban habitat areas throughout the basin.

- Lightly Limit (LL) is applied to all other classes of habitat resource identified in Metro's inventory. Protection efforts for LL resource areas are discretionary, primarily relying upon incentives to encourage property owners and developers to preserve and improve conditions in these areas. This can be achieved in a variety of ways, some of which may yet be determined through concept planning for new urban areas. The LL designation also applies to non-resource areas within the basin, in effect including the entire urban watershed. For these areas, low-impact development practices are encouraged through education and incentives. The program recognizes new urban areas as an opportunity to explore a mores comprehensive approach to mitigating environmental impacts of stormwater.

4. City of Hillsboro

As of May 2, 2006, the City of Hillsboro had not annexed the Helvetia concept planning area nor revised its Significant Natural Resources Overlay District map to include the planning area.

On January 5, 2007, the City of Hillsboro proposed text amendments to the Hillsboro Comprehensive Plan (HCP), Zoning & Subdivision Ordinances (ZOA and SOA) related to implementation of the Tualatin Basin Fish & Wildlife Program to comply with Metro Urban Growth Management Functional Plan, Title 13: Nature in Neighborhoods.

There are no additional regulations being proposed for the Tualatin Basin Program. The regulatory component of the Program consists of existing Clean Water Services Design & Construction standards/vegetated corridor requirements applicable to proposed development and redevelopment activities within and adjacent to areas designated as Water Quality Sensitive Areas (see subsection 2, Clean Water Services, above). The Program is intended to convey a benefit to the developer in exchange for the use of habitat-friendly development practices. It is not intended to increase development restrictions. Use of the habitat friendly development standards would be at the option of the developer/property owner.

The Tualatin Basin Program encourages the use of environmentally sensitive site design and construction practices throughout the watershed in order to reduce the impact of new development on fish and wildlife habitat in the basin, and to aid in improving environmental health. These design and construction practices include a variety of techniques known collectively as Habitat Friendly Development. A subset of Habitat Friendly Development is Low Impact Development (LID) which includes methods of reducing stormwater runoff and the overloading of storm sewers through the integration of open space and pervious surfaces into new development or existing development through retrofitting.

The Tualatin Basin Goal 5 Program Report recognizes that most jurisdictions in the Basin will need to remove barriers in their existing regulations in order to allow for a Habitat Friendly/LID approach to meeting stormwater management requirements. The proposed HCP, ZOA, and SOA amendments will fulfill Hillsboro's obligation under the Tualatin Basin Natural Resources Coordinating Committee's Intergovernmental Agreement with Metro to remove barriers to utilization of LID techniques and to encourage and facilitate the use of other habitat-friendly development practices.

5. National Wetland Inventory

The National Wetlands Inventory Map for the Hillsboro, Oregon quadrangle, as mapped by the USDI Fish and Wildlife Service (USFWS), indicates that potential wetland features are associated with the Waible Gulch drainage along the western boundary of the Helvetia concept planning area and with a tributary to Waible Gulch in the northern portion of the Helvetia planning area:

- The channel of Waible Gulch is identified as a *palustrine emergent seasonally flooded excavated* (PEMCx) wetland
- The channel of the northern tributary to Waible Gulch is also identified as a *palustrine emergent seasonally flooded excavated* (PEMCx) wetland near its confluence with Waible Gulch
- Another portion of this same tributary is identified as a *palustrine forested temporarily flooded* (PFOA) wetland

6. Federally and State Listed Species

The USFWS list of *Federally Listed Threatened, Endangered, Proposed, Candidate Species and Species of Concern Which May Occur in Washington County* identifies 16 listed, proposed, or candidate species that may occur in the City of Hillsboro. Of those 16 species, five animals and six plants have the potential to occur in the vicinity of the Helvetia concept planning area:

Birds	
Bald eagle	T
Yellow-billed cuckoo	C
Streaked horned lark	C
Fish	
Steelhead (upper Willamette River)	T
Amphibians & Reptiles	
Oregon spotted frog	C
Plants	
Golden Indian paintbrush	T
Willamette daisy	E
Howellia	T
Bradshaw's lomatium	E
Kincaid's lupine	T
Nelson's checker mallow	T

E = Endangered
T = Threatened
C = Candidate

The Oregon Natural Heritage Information Center (ORNHIC) lists two records of state- or federally-listed species in the vicinity of the planning area. These records indicate that Oregon Department of Fish and Wildlife fisheries biologists determined that steelhead (Upper Willamette River ESU, winter run) - federally listed as Threatened - previously were undocumented, but should be considered as potentially occurring in the Tualatin River and its tributaries, and in McKay Creek and its tributaries.

The ORHNIC database contains no other records of federal or state listed species within two miles of the Evergreen planning area.

7. Permitting Requirements

The following is a preliminary list of potential environmental permitting requirements for implementing the Helvetia concept plan, and reflects potential federal, state, and local requirements. The environmental considerations identified in this regulatory list should be considered preliminary; actual environmental effects and regulatory requirements will become better known after finalizing the plan and refining the natural features and their boundaries.

Some permitting requirements may yet be identified, and others may be eliminated during plan development. The affected jurisdictions recommend pre-application meetings to refine possible permit requirements. In some cases, permitting requirements are presumed at this conceptual level of project development, although uncertainty exists. Some regulated activities and requirements may only be fully understood after development plans are set because construction methods vary. Mitigation measures during construction can reduce environmental effects that cannot be avoided or minimized through engineering design. All of the regulations require some form of compensation for resources that would be impacted.

- **Federal**
  - Clean Water Act—for disturbances to waters and wetlands; also, effects on water quality
  - Endangered Species Act/Magnuson-Stevens Act—for effects on listed threatened or endangered species, their habitats, and fisheries (e.g., steelhead trout)
  - National Historic Preservation Act—for effects on cultural and historic resources

- **Oregon**
  - Oregon Wetland Removal/Fill Law—for disturbances to waters and wetlands
  - Fish Passage Rule—for passage by native migratory fish

- **Clean Water Services District**
  - Design and Construction Standards & Service Provider Letters (SPL)—for impacts to vegetated corridors
  - Site Development Permit—for erosion control and water quality protection

- **Washington County/City of Hillsboro**
  - Development Permit—for impacts to Significant Natural and Cultural Resources, including wildlife habitat, floodplains, and drainage hazard areas

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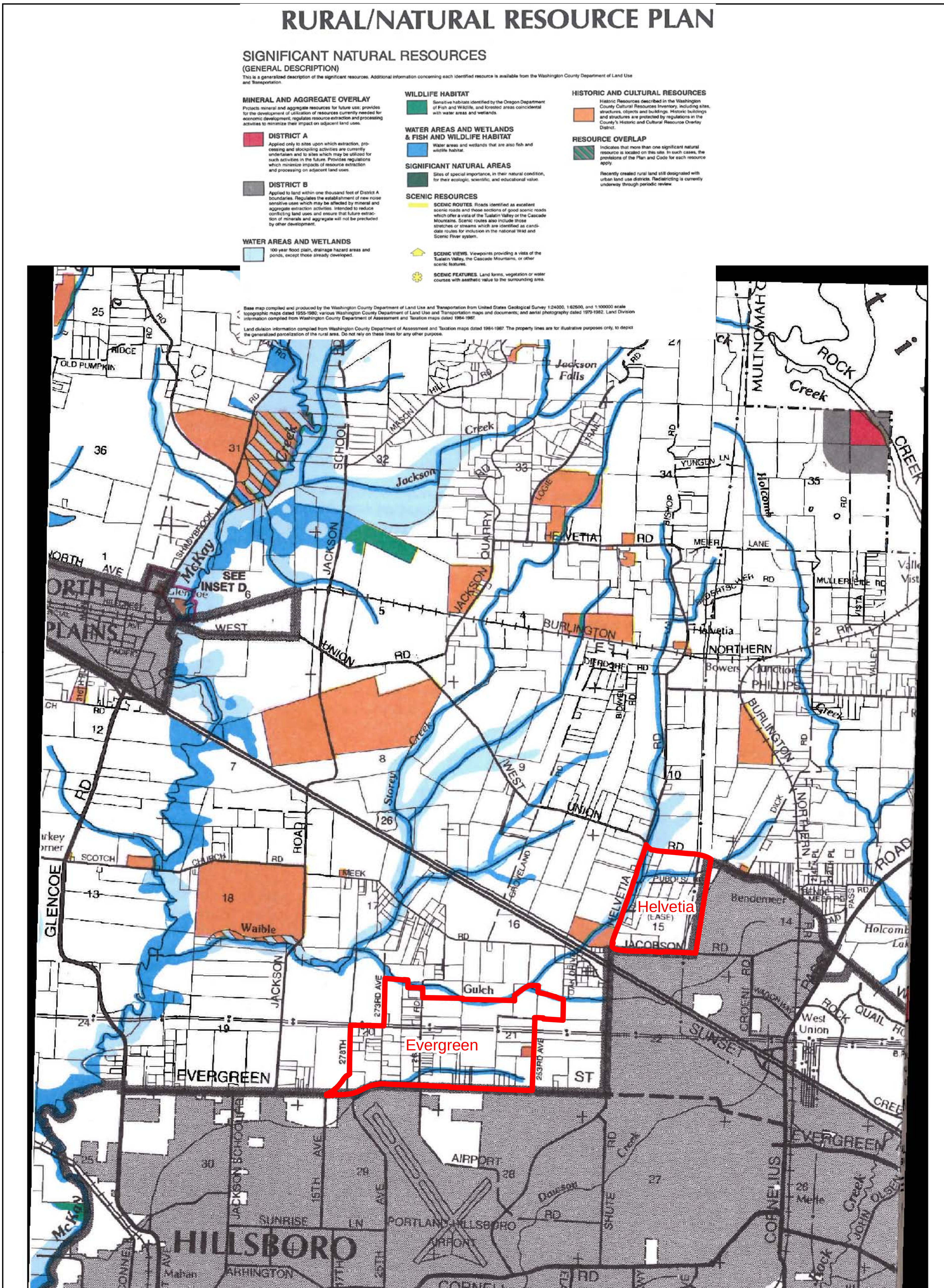

LEGEND

Project Sites

N

0 3,500 7,000
Feet

Figure VII.1
Broad Scale Natural Resources Study Area
Evergreen/Helvetia UGB Concept Plan

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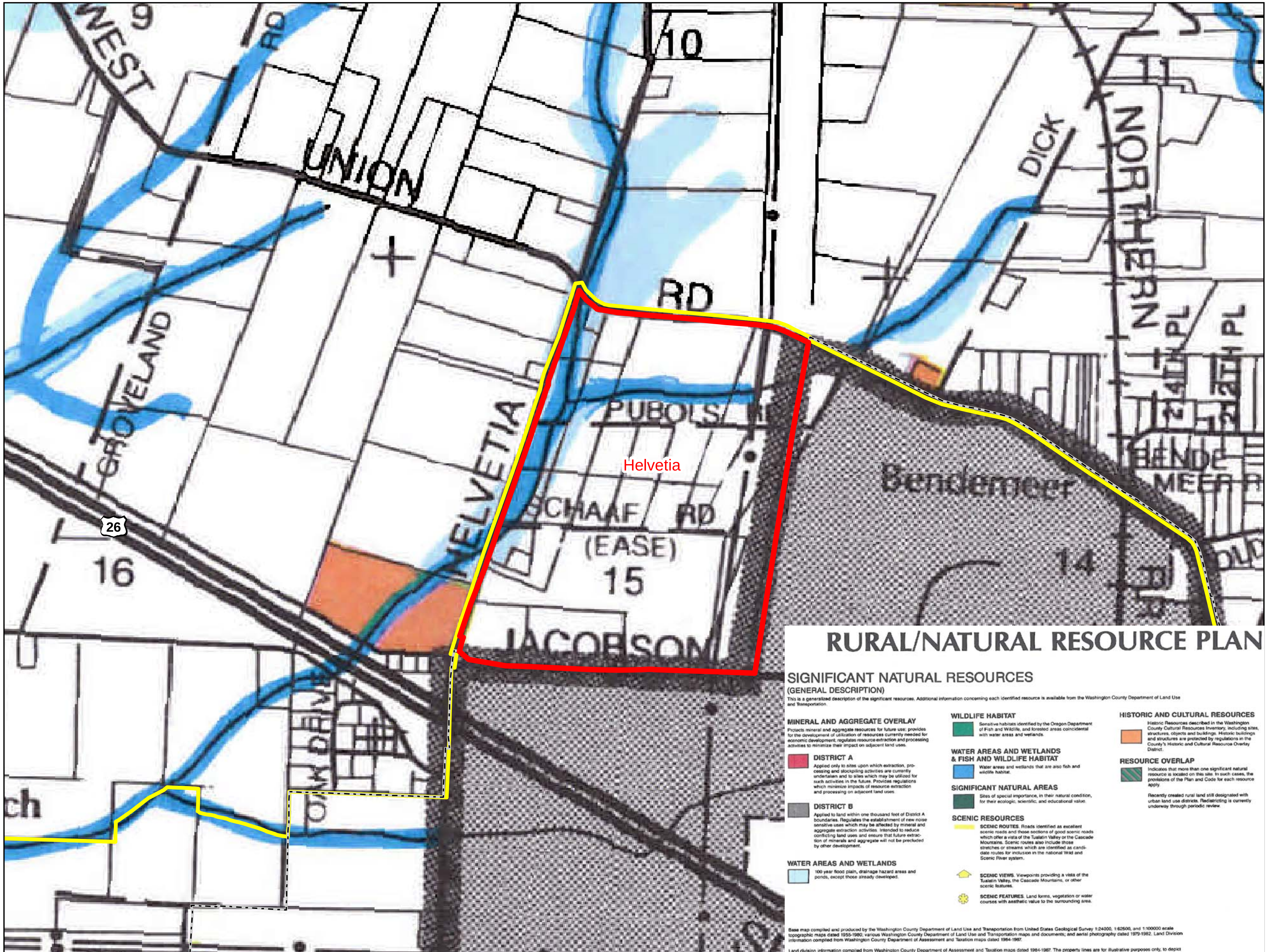

Figure VII.2

Significant Natural Resources, Rural/Natural Resource Plan Element, Washington County Comprehensive Plan

Helvetia UGB Concept Plan

LEGEND

- Helvetia Site (Planning Area = 242.12 ac)
- Hillsboro City Limits
- Hillsboro UGB

N

0 1,000 2,000
Feet

Angelo planning group

CH2MHILL

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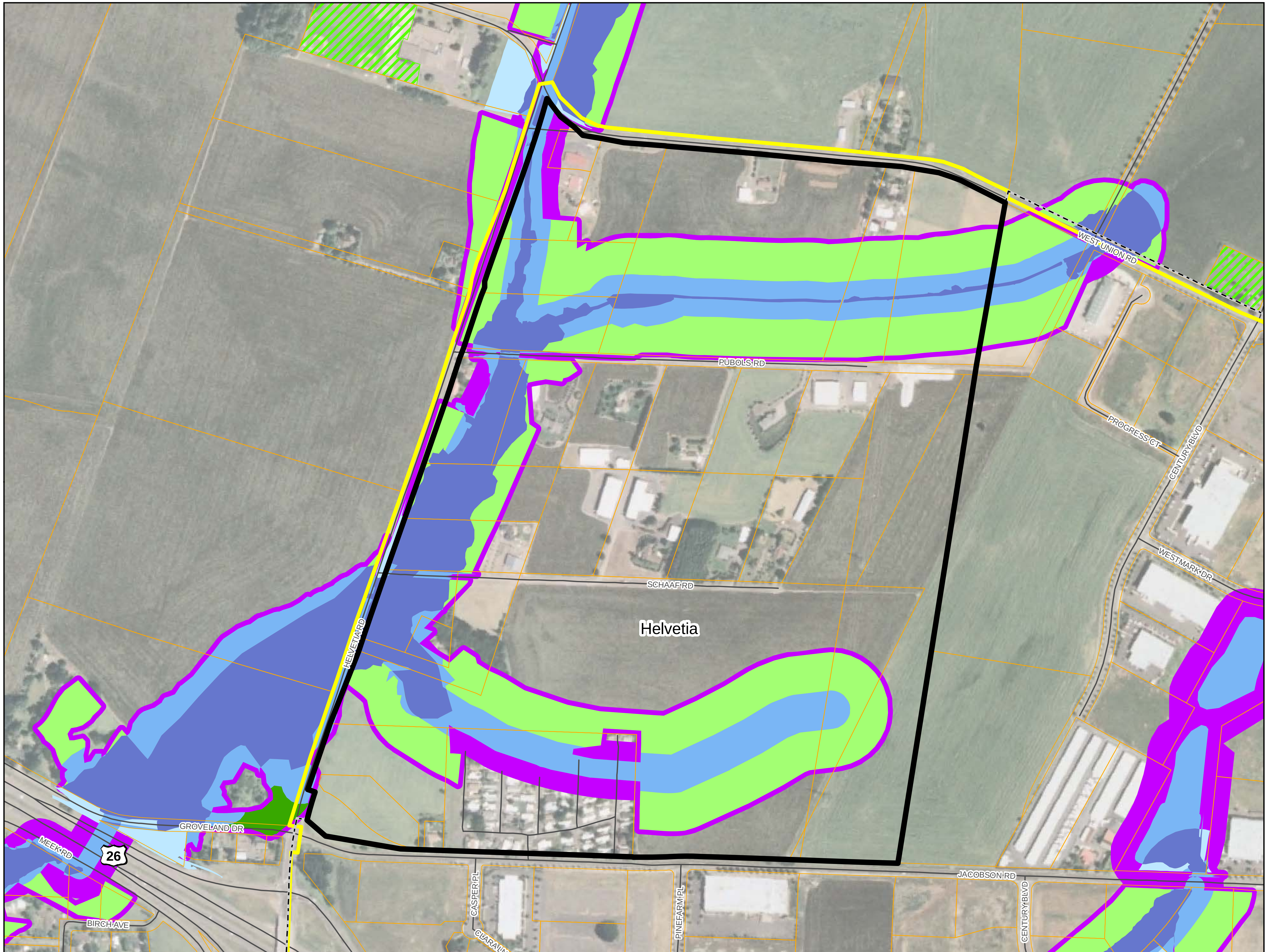
Figure VII.3

METRO Regionally Significant Habitat Inventory (2004)

Helvetia UGB Concept Plan



LEGEND

- Helvetia Site (Planning Area = 242.12 ac)
- Hillsboro City Limits
- Hillsboro UGB
- Roads
- Tax Lots
- Parks

METRO Goal 5 NIN

- Class I Riparian
- Class II Riparian
- Class III Riparian
- Class B Habitat
- Class C Habitat
- Impact Area

N

0 500 1,000

Feet

Angelo planning group

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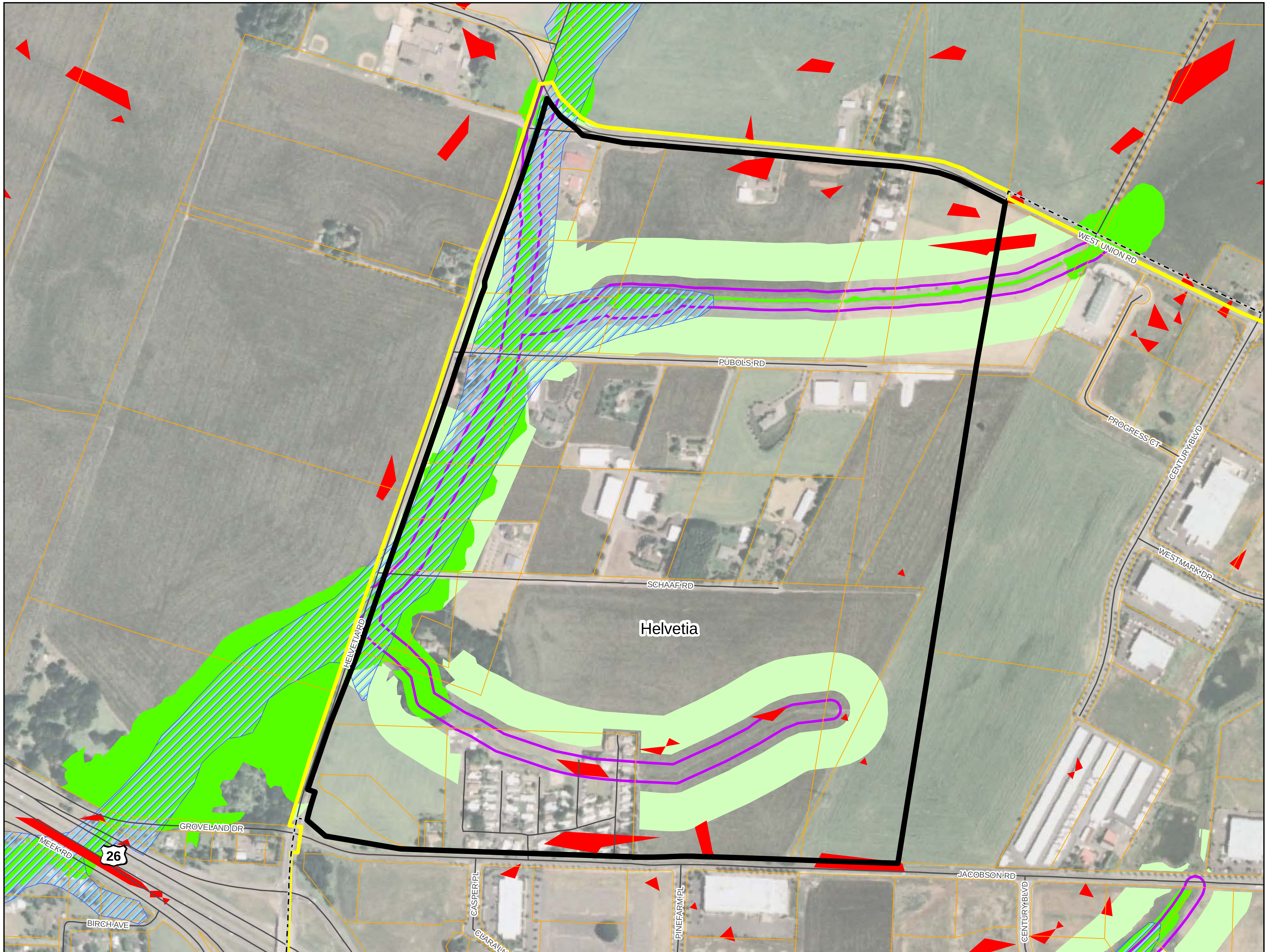

Figure VII.4

Steep Slopes and Development Limitations

Helvetia UGB Concept Plan

LEGEND

- Helvetia Site (Planning Area = 242.12 ac)
- Hillsboro City Limits
- Hillsboro UGB
- Roads
- Tax Lots
- >= 25% Slope
- 100-year FEMA Floodplain
- Vegetated Corridor
- Strictly Limit
- Moderately Limit
- Lightly Limit

N

0 500 1,000

Feet

Angelo planning group

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VIII. Cultural Resources

A file search was conducted at the Oregon State Historic Preservation Office to identify previously recorded historic sites or resources in the Helvetia concept planning area. General Land Office (GLO) maps were examined for the area to identify early Donation Land Claims. Additional research was conducted at the Washington County Historical Museum and the Oregon Historical Society. The following information is not based on intensive surface or archaeological field surveys of the area. (See Appendix C for the complete *Cultural Resources Report*.)

The Helvetia concept planning area is part of the original D. T. Lennox Donation Land Claim (DLC)(General Land Office 1862) (see Figure III.1). Lennox was born in 1802 in Catskill, New York and settled his claim in Washington County in 1844. A review of abstracts from applications for Donation Land Claims shows Lennox to have been a prominent and active member of the community (Genealogical Forum of Portland 1957).

Two notable landmarks are present on lands adjacent to the Helvetia site: West Union Baptist Church and the Five Oaks Meeting Place.

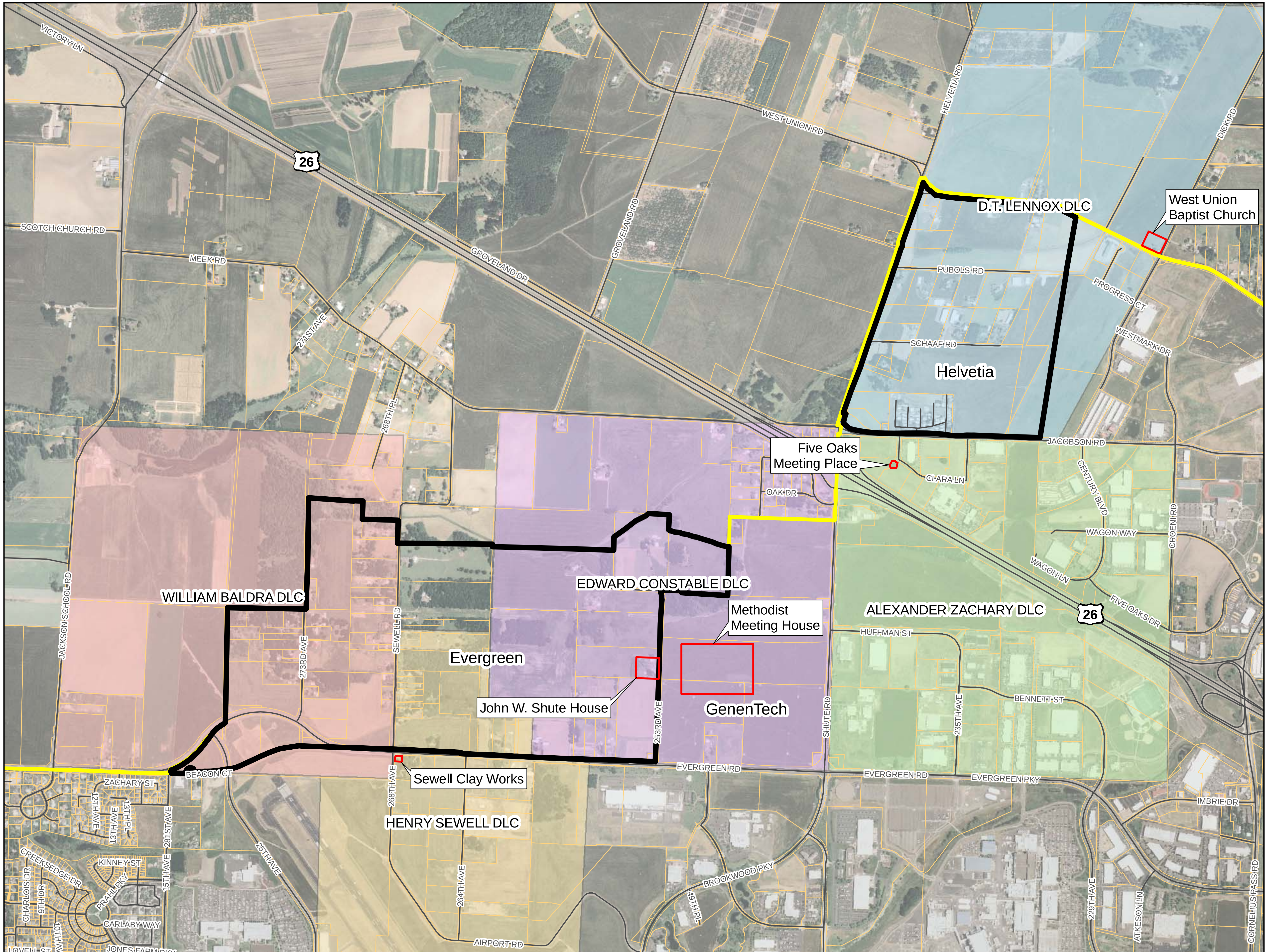
- **West Union Baptist Church and Cemetery.** Constructed in 1844 on land donated by D.T. Lennox, the church is notable for being the first Baptist Church west of the Rocky Mountains. The church is located in the northwest quadrant of the intersection of West Union Road and Dick Road. The church is listed on the National Register of Historic Places. D. T. Lennox is buried in the adjacent church cemetery.

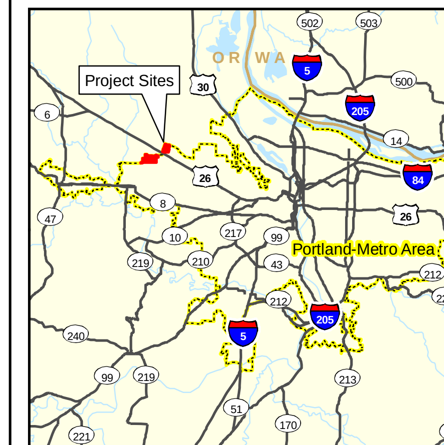

West Union Baptist Church

- **Five Oaks Meeting Place.** This location, originally the site of five large Oregon White Oaks, is located on the Alexander Zachary DLC (General Land Office 1862). It is a locally significant historic site known as a meeting place for local historic figure Joseph Meek and other early mountain men and settlers. Parades, picnics, religious meetings horse races and sessions of the County Court were all held at this location as late as the early 1900s. Two of the original five oaks remain on the site. The site is located just south of the Helvetia Parcel off of Casper Place and is marked by an informational kiosk.

Figure VIII.1
Historic Areas Near Project Sites

Evergreen/Helvetia UGB
Concept Plan





LEGEND

- Cultural Sites of Interest
- Alexander Zachary DLC
- D.T. Lennox DLC
- Edward Constable DLC
- Henry Sewell DLC
- William Baldra DLC
- Project Sites
- UGB
- Roads
- Tax Lots

N

0 1,500 3,000
Feet

Angelo planning group

CH2MHILL

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IX. Transportation

This section provides a review of existing transportation conditions for the Helvetia Conceptual Design Plan. An analysis of how the transportation system performs today was made to establish a baseline for later evaluation of the impact of the proposed industrial development. This information is compared to identified performance or design standards, as appropriate, and any elements that are found to be deficient are identified. A discussion of the existing pedestrian, bicycle and transit facilities is also included.

The following study intersections, as shown on Figure IX.1, were chosen for the Helvetia planning area:

- NW Helvetia Road / NW West Union Road (analyzed as three intersections)
- NW Helvetia Road / NW Jacobson Road
- NW Shute Road / Hwy 26 WB Ramps
- NW Shute Road / Hwy 26 EB Ramps
- NW Shute Road / NW Huffman Street
- NW Shute Road / NW Evergreen Parkway
- NW Jacobson Road / NW Century Boulevard
- NW Corneilus Pass Road / NW Jacobson Road

At each location, traffic data was gathered and analyzed to evaluate current conditions and performance for all modes of travel. Additional data was collected for other aspects of the transportation system including built facilities as described by Metro GIS data, and reported traffic volumes on state and county facilities. The following sections describe the characteristics, usage, and performance of the study intersections in the City of Hillsboro and Washington County.

A. Existing Street Network

Inventories were conducted to determine characteristics of major roadways in the study area. Data collected included intersection geometry, traffic controls and turn movement counts, as shown on Figure IX.2. Five of the eight study intersections are controlled by traffic signals. The intersection geometry of Helvetia Road/West Union Road creates five intersections, all of which are stop-controlled on the minor street approach. The other two intersections at Helvetia Road/Jacobson Road and at Shute Road/Huffman Street are also stop-controlled on the minor street approaches.

For each roadway, jurisdiction, functional classification by various agencies, and the approximate average daily traffic (ADT) were recorded in Table IX-1. Intersection control types at study intersections are shown on Figure IX.2.

Table IX-1: Existing Roadway Jurisdiction, Functional Classification and Characteristics

Roadway	Jurisdiction	Motor Vehicle Functional Class			Approximate ADT
		ODOT	Washington County	City of Hillsboro	
Hwy 26 west of Shute Rd	ODOT	Rural Principal Arterial	Freeway	Freeway	40,800
Hwy 26 east of Shute Rd	ODOT	Urban Principal Arterial – Freeway	Freeway	Freeway	56,300
West Union Rd	County	N/A	Arterial	Arterial	3,970
Evergreen Rd	County	N/A	Arterial	Arterial	12,770
Evergreen Pkwy	County	N/A	Arterial	Arterial	12,920
Helvetia Rd	County	N/A	Arterial	Arterial	5,080
Shute Rd	County	N/A	Arterial	Arterial	30,600
Cornelius Pass Rd	County	N/A	Arterial	Arterial	27,410
Jacobson Rd	City	N/A	Collector	Collector	3,840
Huffman St	City	N/A	Collector	Collector	1,350
Meek Rd	County	N/A	Collector	N/A	340
NW 229th Ave	City	N/A	Collector	Collector	10,380
Century Blvd	City	N/A	Collector	Collector	N/D

Notes: ADT obtained from published ODOT, Washington County, and City of Hillsboro data.
N/A = Not Applicable
N/D = No Data Available

Level of service (LOS) and volume to capacity (v/c) ratios are both used as measures of effectiveness for intersection operation. LOS is similar to a "report card" rating based upon average vehicle delay. Level of service A, B, and C indicate conditions where traffic moves without significant delays over periods of peak hour travel demand. Level of service D and E are progressively worse peak hour operating conditions. Level of service F represents conditions where average vehicle delay exceeds 80 seconds per vehicle entering a signalized intersection and demand has exceeded capacity. This condition is typically evident in long queues and delays. Unsignalized intersections provide levels of service for major and minor street turning movements. For this reason, LOS E and even LOS F can occur for a specific turning movement; however, the majority of traffic may not be delayed (in cases where major street traffic is not required to stop). LOS E or F conditions at unsignalized intersections generally provide a basis to study intersections further to determine availability of acceptable gaps, safety and traffic signal warrants.

A volume to capacity ratio (v/c) is the peak hour traffic volume at an intersection divided by the maximum volume that intersection can handle. For example, when a v/c is 0.80, peak hour traffic is using 80 percent of the intersection capacity. If traffic volumes exceed capacity, queues will form and will lengthen until demand subsides below the available capacity. When the v/c approaches 1.0, intersection operation becomes unstable and small disruptions can cause traffic flow to break down.

Level of service, delay and volume to capacity ratios are used as measures of effectiveness for study intersection performance. Washington County's target performance standard for the study intersections is a maximum volume-to-capacity (V/C) ratio of 0.9. The ODOT operating performance standard requires facilities such as US 26 that are inside an Urban Growth Boundary and within the Portland Metropolitan Region to operate below the maximum v/c of 0.99.

The PM peak hour intersection volumes were used to determine the existing study intersection operating conditions based on the 2000 Highway Capacity Manual methodology for signalized and unsignalized intersections. Traffic volumes and level of service calculations can be found in Appendix D. Table IX-2 summarizes the existing weekday PM peak hour intersection operation at study intersections.

All of the study intersections currently operate within the performance standards during the PM peak hour. The greatest delay at an unsignalized intersection is experienced at Helvetia Road/Jacobson Road where over 180 vehicles make a westbound left turn during the evening peak hour.

Table IX-2: Weekday PM Peak Hour Intersection Level of Service

Intersection	LOS	Average Delay (sec)	Volume/ Capacity (v/c)
Signalized Intersections			
Shute Rd/Hwy 26 WB Ramps	C	20.4	0.72
Shute Rd/Hwy 26 EB Ramps	A	7.7	0.64
Shute Rd/Evergreen Parkway	D	35.0	0.73
Cornelius Pass Rd/Jacobson Rd	B	17.9	0.67
Unsignalized Intersections			
Helvetia Rd/West Union Road (North)	A/A	0.5	0.00/0.02
Helvetia Rd/West Union Road	A/C	8.5	0.08/0.26
Helvetia Rd/West Union Road (South)	A/A	0.0	0.00/0.00
Helvetia Rd/Jacobson Road	A/E	8.3	0.01/0.74
Shute Rd/Huffman Street	C/D	1.3	0.03/0.36
Jacobson Rd/Century Blvd	A/B	1.0	0.00/0.08

Notes: Deficiencies are indicated in **bold**.
LOS = Level of service
Delay = Average vehicle delay in the peak hour for entire intersection in seconds.
Unsignalized Intersection Operations:
A/A = Major street turn LOS / Minor street turn LOS
#/# = Major street turn v/c / Minor street turn v/c

B. Access Management

Proper roadway access spacing is important to maintain operating characteristics and safety. The Washington County access management standards, as defined in Section 501-8.5 of the Washington County Development Code, call for minimum distances between access points on the same side of the roadway.

Jacobson Road is planned to be realigned to the north where it intersects Helvetia Road, to better conform with ODOT access spacing standards, and to provide more balanced access for developing properties within the site. Intersection spacing along Helvetia Road should be placed to conform to county standards, which restricts full access to no closer than 600 feet on an arterial facility, and to allow for future potential expansion of the UGB further west. Internal collectors proposed will be subject to a minimum driveway spacing of 100 feet.

C. Freight

Efficient truck movement plays a vital role in the economical movement of raw materials and finished products. The designation of through truck routes provides for this efficient movement while at the same time maintaining neighborhood livability, public safety, and minimizing maintenance costs of the roadway system. ODOT identifies US 26 as a state freight route and Washington County identifies arterial roadways as county freight routes within the study area as shown on Figure IX.3.

Truck (heavy vehicle) volumes were collected as part of the intersection turn movement counts and were used in motor vehicle operations calculations. Truck volumes and percentages at the study intersections are shown on Figure IX.3. Of the eight study intersections, the three nearest to the Helvetia Concept Plan site experience the lowest truck volumes.

D. Pedestrian and Bicycle Network

Narrow sidewalks exist along many of the study area roadways with gaps occurring mostly where there are vacant properties or properties outside the city limits of Hillsboro. A sidewalk inventory from Metro GIS data is shown on Figure IX.4.

In the study area, bike lanes are provided on many of the arterial roadways within the city limits of Hillsboro. There are no bike lanes provided outside city limits or adjacent to the Helvetia Concept Plan area. A bicycle facility inventory from Metro GIS data is shown on Figure IX.5.

Pedestrian and bicycle volumes at the study intersections were counted between during the PM peak periods. The weather on the days of the counts was cloudy to partly cloudy with precipitation under 0.02 inches and high temperatures in the low 50s. The peak hour volumes indicate the relative differences in pedestrian and bicycle demand at study intersections. Although the study area vehicular evening peak hour typically occurs between 4:00 and 6:00 PM, intersections located near schools and other activity centers may experience higher pedestrian and bicycle volumes earlier in the day. Pedestrian and bicycle volumes at each study intersection are shown in Table IX-3.

Table IX-3: PM Peak Hour Pedestrian and Bicycle Volumes at Study Intersections

Intersection	Pedestrian Volume		Bicycle Volume	
	North-South	East-West	North-South	East-West
Helvetia Rd/West Union Road (North)	0	0	1	0
Helvetia Rd/West Union Road	0	0	2	1
Helvetia Rd/West Union Road (South)	0	0	2	0
Helvetia Rd/Jacobson Road	0	0	2	3
Shute Rd/Hwy 26 WB Ramps	0	0	3	0
Shute Rd/Hwy 26 EB Ramps	0	0	3	0
Shute Rd/Huffman Street	0	0	2	0
Shute Rd/Evergreen Parkway	1	0	0	2
Jacobson Rd/Century Blvd	1	1	0	0
Cornelius Pass Rd/Jacobson Rd	5	4	7	0

E. Public Transit

Transit service is provided in the study area by the Tri County Metropolitan Transportation District of Oregon (TriMet), which provides transit service for the Portland Metro area including the counties of Clackamas, Multnomah and Washington. Route 47 travels along Baseline Road, NW 229th Avenue, and Evergreen Parkway, connecting the Hillsboro Transit Center to the Willow Creek/SW 185th Ave Transit Center. This bus route connects to MAX stops for the MAX Blue Line, which travels east-west through the metro area from Hillsboro to Gresham via downtown Portland. The existing transit routes and stop locations are shown on Figure IX.6. Current TriMet level of service within the study area is summarized in Table IX-4.

Table IX-4: Transit Service Route Weekday Peak Period Level of Service

Transit Route	Average Headways (minutes)			Level of Service Based on Time between Buses		
	AM	Midday	PM	AM	Midday	PM
#47 to Hillsboro TC	31	45	31	E	E	E
#47 to 185th Ave TC	30	53	30	E	E	E

Note: AM Period = 6:00-08:30 AM, Midday Period = 8:30 AM-4:00 PM, PM Period = 4:00-6:00 PM
Level of Service for transit service based on headway: less than 10 minutes = LOS A;
10-14 minutes = LOS B; 14-19 minutes = LOS C; 20-29 minutes = LOS D; 30-60 minutes = LOS E;
And greater than 60 minutes = LOS F.

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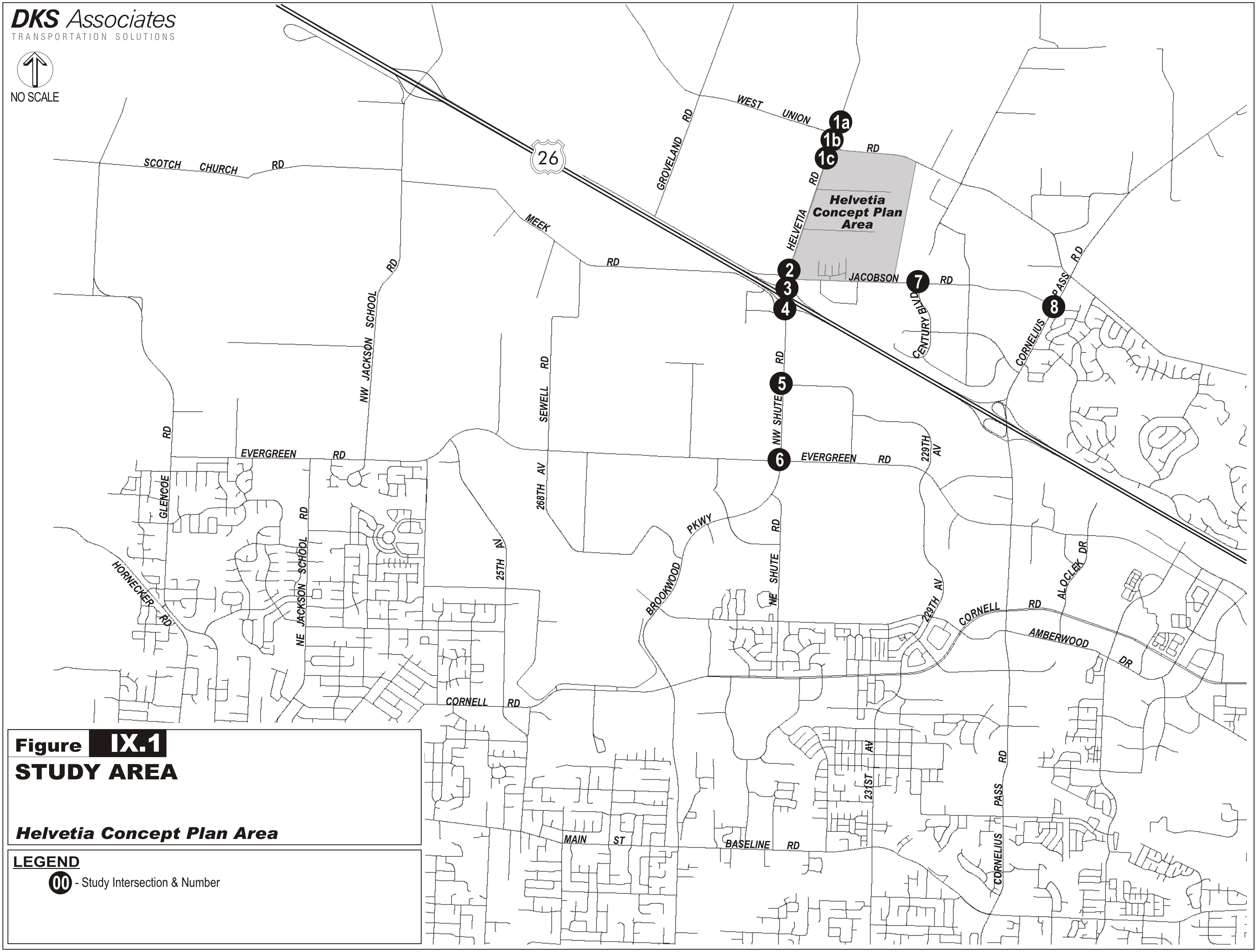


Figure IX.1
STUDY AREA

Helvetia Concept Plan Area

LEGEND

00 - Study Intersection & Number

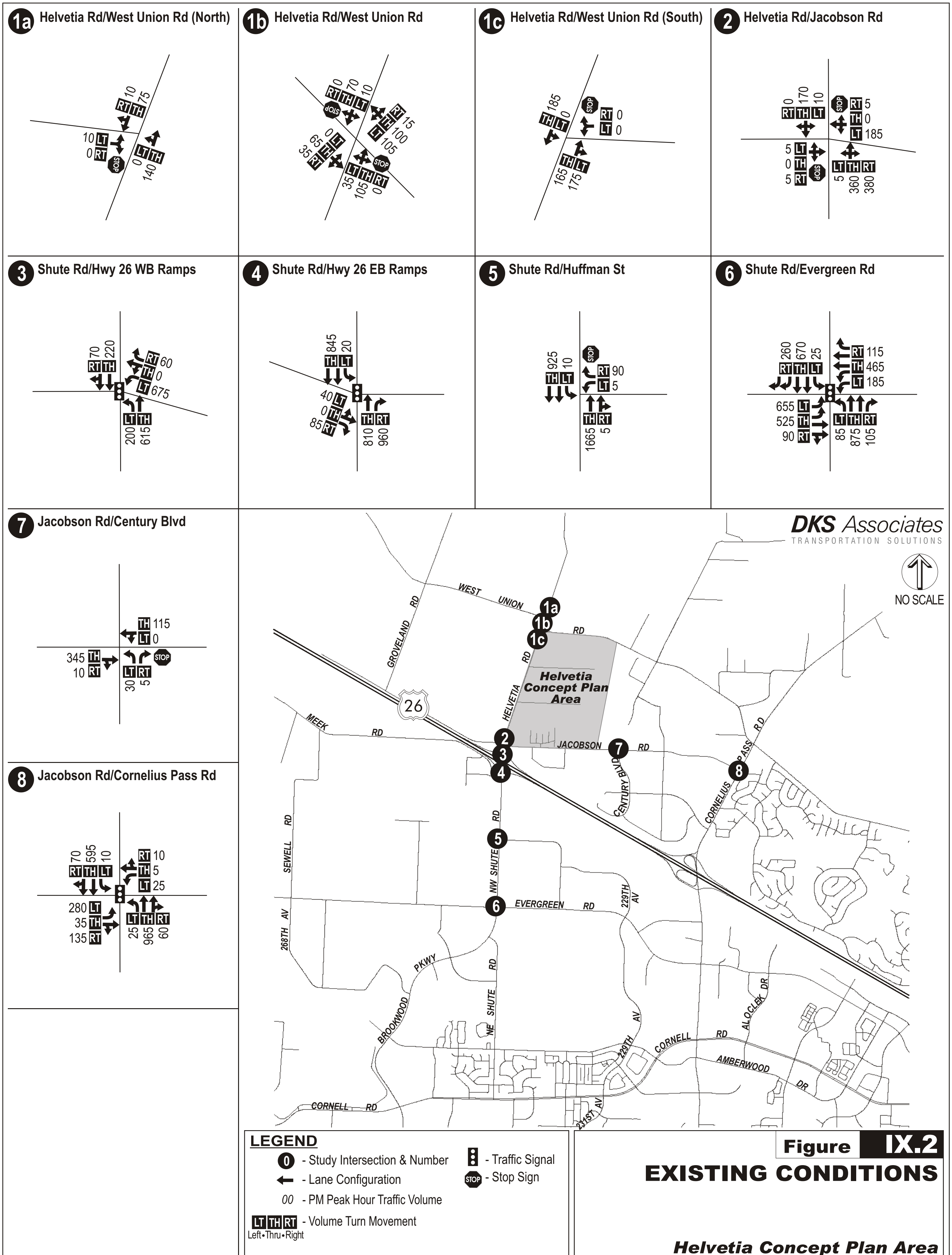


Figure IX.2
EXISTING CONDITIONS
Helvetia Concept Plan Area

Figure IX.3: Freight Routes

Helvetia Concept Plan Area

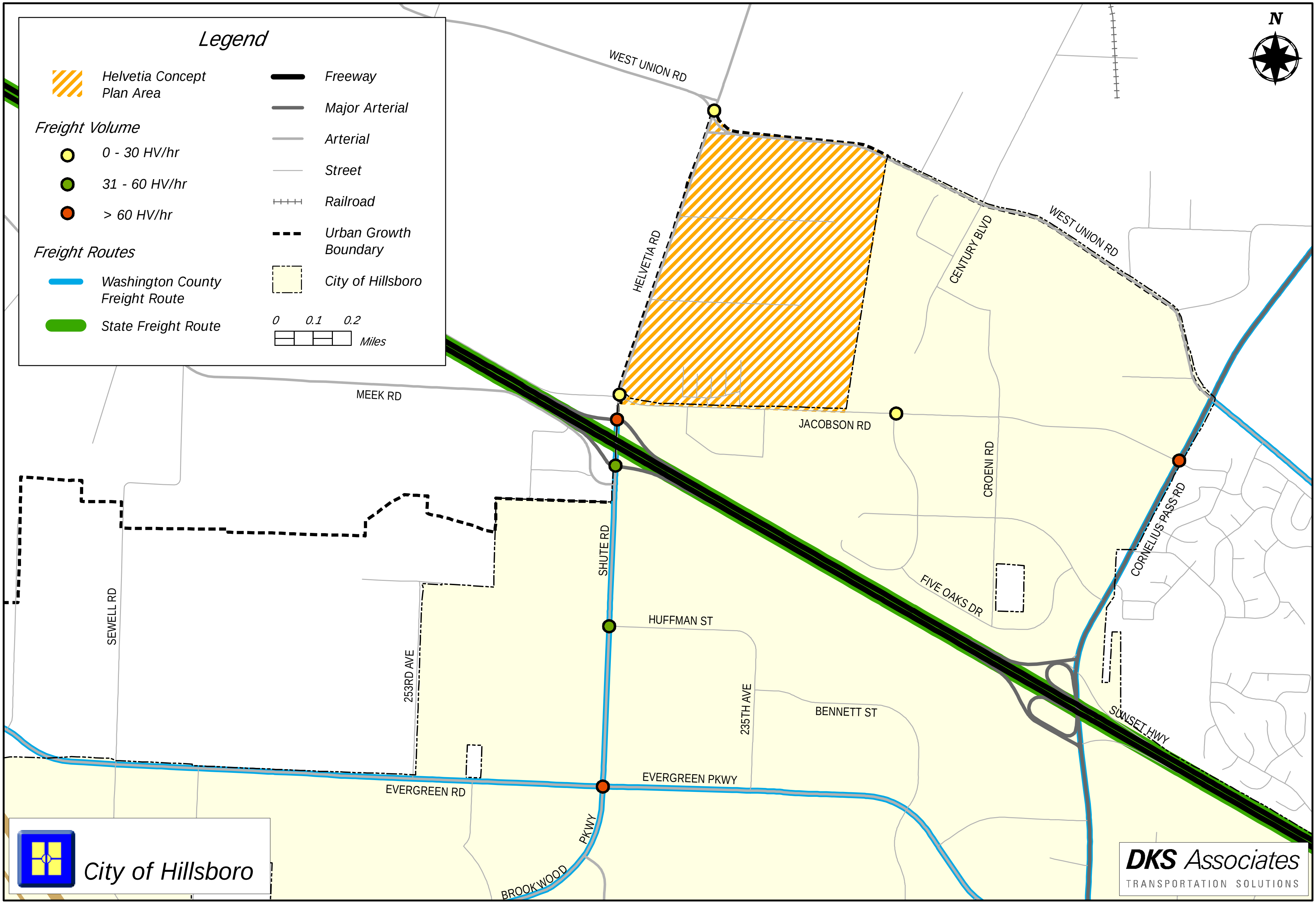


Figure IX.4: Sidewalk Inventory

Helvetia Concept Plan Area

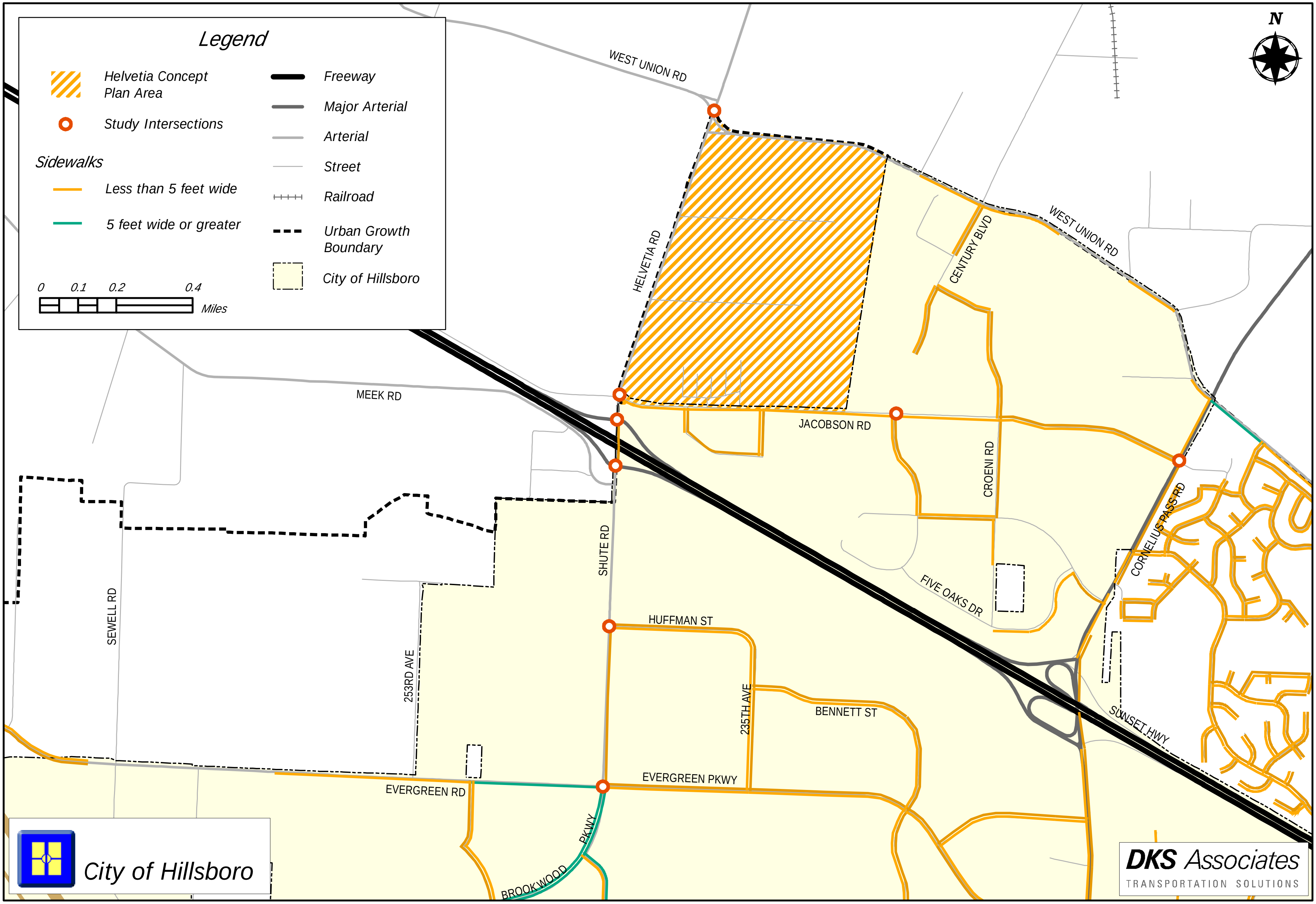


Figure IX.5: Bicycle Inventory

Helvetia Concept Plan Area

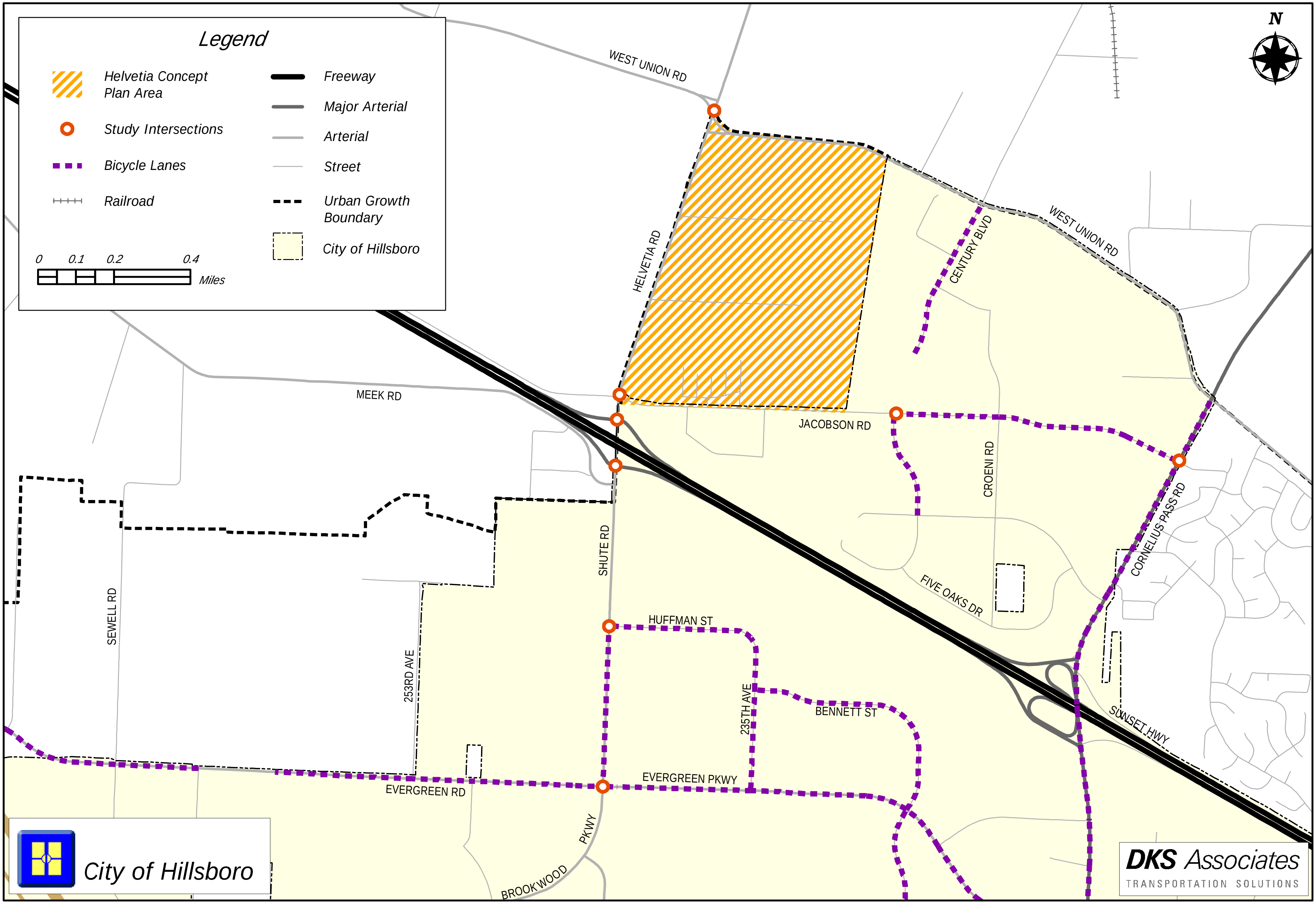
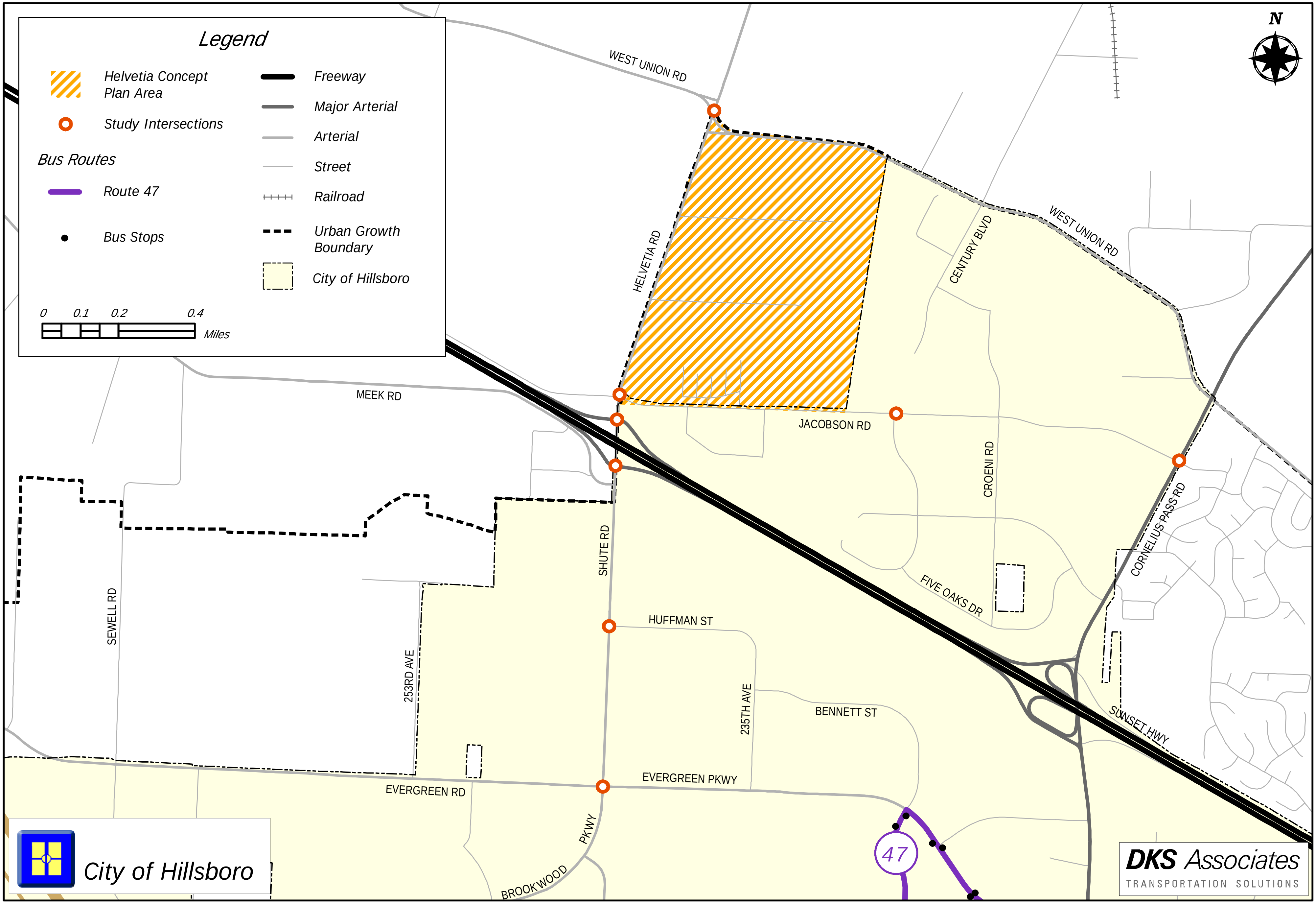


Figure IX.6: Existing Transit Facilities

Helvetia Concept Plan Area



Appendix A

Helvetia Area Landowners

Helvetia Area Landowners

Appendix A: Helvetia Area Landowners with 10+ Acres

Owner Name	Total Acres	Total Lots
Baker-Bindewold Investments LLC	50.78	1
Stephen L., Ralph G. and Susan L. Coan	14.55	1
Julian F. and Sharon D. Cranford Trustees	28.51	1
Valentine and Jean P. Schaff Living Trust	14.76	4
Total	**108.59**	**7**
Percent of Total Acres in Helvetia Area	**45.44%**	**-**

Source: Washington County 2006 Assessment and Taxation database and Leland Consulting Group.

Appendix B

Natural Resources Report

Appendix B

Natural Resources

Purpose of this Technical Memorandum

This technical memorandum presents a broad-scale natural features overview of the Helvetia Concept Plan area and vicinity. This overview will guide natural resources planning as well as infrastructure and land use layout during the concept planning process. This memorandum is only intended as an initial overview based upon published information – the data do not reflect observations from site survey. The focus here is on generalized natural features and related regulatory information. Natural features characterizations could change as supplemental data and field information become available.

Four natural features and environmental constraints were identified in the undeveloped 249-acre Helvetia planning area :

- Riparian corridors, including water and riparian areas and fish habitat
- Wetlands
- Groundwater resources
- Natural areas

Continued on next page

Broad-Scale Natural Features

Broad-Scale Natural Features Study Area

- The broad-scale study area provides the landscape context for concept planning, and suggests linkages between the Helvetia planning area and surrounding natural communities and habitats.
- The broad-scale study area for identifying natural features around the Helvetia planning area is the Lower McKay Creek streamshed, known as Metro Regional Site 6 (see Figure VII.1). The streamshed encompasses five Tualatin Basin Partners Local Sites:

- #19 Dairy Creek
- #32 Glencoe Swale
- #45 McKay Creek
- #55 Storey Creek
- #66 Waible Gulch

Landscape Overview

Important landscape characteristics of the broad-scale study area:

- The lower McKay streamshed is located in low hills and valley terraces of the Tualatin subbasin;
- Topography is generally flat to gently sloping;
- Scenic views of the horizon extend south to the Chehalem Mountains, north to the Tualatin Mountains, and west to the Coast Range;
- Annual precipitation is 40 to 60 inches;
- The flow of water and energy is generally southward, toward the Tualatin River;
- 100-year floodplains (mapped by FEMA) are associated with the McKay Creek and Waible Gulch floodplain, but Washington County drainage hazard areas extend up lesser creeks and their tributaries; floodplains have been modified by drainage, realignment of waterways, and road crossings; other than the creeks, surface water typically exists as created ponds for agricultural or water supply;
- Ground is underlain by the Woodburn-Quatama-Willamette soil association—very deep, moderately well drained and well drained, nearly level to moderately steep silt loams and loams;
- Land use is primarily agricultural rural-residential;
- Predominantly agricultural habitats support a moderate diversity of wildlife; woodlots and wetlands provide forage and nesting habitats, and riparian areas provide movement corridors for aquatic and terrestrial wildlife.

Continued on next page

Washington County Comprehensive Plan

Although the Helvetia planning area has been brought into the City of Hillsboro's Urban Growth Boundary (UGB), the following natural features of the broad-scale study area are identified on the Washington County Rural/Natural Resource Plan Significant Natural Resources map (mapped natural features are approximate, subject to refinement of boundaries during development permitting) (see Figure VII.2):

- Water Area and Wetlands & Fish and Wildlife Habitat—Water areas and wetlands (i.e., 100-year floodplain, drainage hazard areas, and ponds) that are also fish and wildlife habitat:
  - McKay Creek, including its floodplain and riparian corridor
  - Tributaries to McKay Creek, including their floodplains and riparian corridor
  - Waible Gulch, including its floodplain and riparian corridor
  - Tributaries to Waible Gulch including their floodplains and riparian corridors
- Water Area and Wetlands—100-year floodplain, drainage hazard areas, and ponds, except those already developed:
  - In the floodplains of Waible Gulch and McKay Creek and many of their tributaries
- No other natural features are identified on the resources map

Metro Natural Areas Bond Measure: Measure 26-80

Metro Council's proposed $227.4 million package isdesigned to preserve natural areas and protect rivers, streams and creeks at the regional, local and neighborhood level. The bond measure was subject to popular vote last November and passed. One area, near the concept plan area, has been identified by Metro as target areas for purchase, subject to a willing seller program (Figure VII.3).

McKay Creek in the vicinity of its confluence with Dairy Creek—A major tributary of the Diary Creek, McKay Creek and its tributaries are under intense development pressure as urban growth expands throughout the watershed. The creeks converge at the interface of farmland and the urban growth boundary, forming broad wetlands accessible to a rapidly urbanizing area. Metro believes that protecting the riparian areas and associated wetlands in the confluence area will contribute significantly to improved water quality in these major tributaries of the Tualatin River.

Tualatin Basin Existing Environmental Health Report

The relative environmental health of the Lower McKay Creek streamshed was described by the Tualatin Basin Existing Environmental Health Report Steering Committee as:

Criterion	Assessment
Effective Impervious Area [EIA]	Fair to Good
Stream Flow	Fair
Aquatic Habitat	Poor
Geomorphology	Low Gradient
Riparian Vegetation	Fair
Water Quality	Fair to Poor
Wildlife Habitat	Fair
Overall Environmental Health	Fair

Clean Water Services Healthy Streams Plan

Clean Water Services, in partnership with local jurisdictions and the watershed community, manages the surface water system of the urban portion of the Tualatin River Basin. The *Healthy Streams Action Plan* identifies policy and program refinements, as well as surface water and stormwater projects to be funded through CWS' capital improvement program to improve water quality, water quantity management, and aquatic species habitat. The Healthy Streams Plan articulates the latest scientific information related to watershed and stream management, and identifies and prioritizes projects and activities that could be implemented to further improve regional water resources management. For example, the plan proposes three types of stream health improvement projects in the Lower McKay Creek Watershed:

- Flow Restoration project at McKay Creek near Glencoe and Zion Church Road;
- Community Tree Planting Challenge projects along Waible Gulch and tributaries;
- Four Culvert and Weir Retrofit projects at Waible Gulch and tributaries.

The Healthy Streams' *Environmental Data and Analysis* describe current baseline environmental conditions in the watershed. The socioeconomic and scientific data and analysis were used to develop the recommendations in the Action Plan. Detailed methodology, data, and maps are available through the Healthy Streams Plan's electronic Appendices and Internet links provided in the text, all of which is too extensive to be covered in this technical memorandum. Environmental conditions highlighted by the plan are:

Lower McKay Creek: This creek contains high gradient headwaters and low gradient valley bottom stream types. The upper watershed to the headwaters is relatively undisturbed and in good health, where the Effective

Impervious Area is only about 0-10%. The lower watershed is more disturbed and in moderately good health. The Effective Impervious Area varies, but is as high as 40% in some areas. Stream flow is relatively healthy with few deficiencies caused by water diversions (typically as low as 0-4 cubic feet per second total diversions). Tree canopy along the creek is high in the upper reaches of the watershed and moderate to high in the lower reaches. Streambed material is typically clay/silt throughout most of the system with areas of bedrock and gravel/cobble in a tributary at North Plains. Large woody debris is deficient in the upper reaches of the watershed, but plentiful in the lower reaches. McKay Creek is used by cutthroat trout for spawning and rearing in the upper reaches and for rearing and migration in the lower reaches; consequently, the fish management priority is for cutthroat trout. The priorities for stormwater management are for both quantity and quality. Base flow management is a high priority for the watershed.

Waible Gulch: This creek contains high gradient headwaters, low gradient headwaters, and low gradient valley bottom types. Stream flow is relatively healthy with few deficiencies caused by water diversions (typically as low as 0-4 cubic feet per second total diversions). Although Effective Impervious area is very low (0-10%), agricultural practices have affected stream quality. Stream quality in the lower watershed and most tributaries is moderately good. Stream quality in upper watershed is moderate. Tree canopy along the creek is variable, with low to very low coverage. Streambed material is typically clay/silt from headwaters to confluence with McKay Creek. Large woody debris is deficient at most stream reaches in the watershed. The lower reach of Waible Gulch is used by cutthroat trout for rearing and migration; consequently, the fish management priority is for cutthroat trout. The priorities for stormwater management are for both quantity and quality. Base flow management is a high priority for this watershed.

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Groundwater Hydrology

- Currently, most rainfall infiltrates the soil mantle. The amount of impervious surface area is relatively low. Surface runoff mostly occurs during storms, and then only at low elevations. Infiltrated water enters a dynamic soil storage zone that meters out the steady downslope movement of water. The amount of water stored in soil affects the volume and duration of flow discharged to surface waters.
- Shallow groundwater is present at varying soil depths, and varies by season and rainfall. Agricultural and rural residential land uses probably altered groundwater quantity and quality through ditching and tiling.
- Currently, there is no local groundwater program. In the Tualatin Basin, the general hydrogeologic units consist of the Lower Sedimentary Unit, which overlies the Columbia River Basalt and the Basement Confining units (USGS 2005).
  1. The Lower Sedimentary Unit includes unconsolidated, nonmarine, basin-fill sediments. The predominantly fine-grained formation has an aggregate maximum thickness of about 1,400 feet. Discontinuous beds of silty sand with minor gravel, deposited by low-gradient meandering streams, are common in the upper part of the formation, but become less common with depth.
  2. The Columbia River Basalt Unit consists of a series of flood-basalt lavas. The altitude of the upper surface of the basalt is about -1,200 feet in the center of the Tualatin Basin. The unit generally ranges from 200 to 1,000 feet in thickness, and is characterized by thin, often permeable, interflow zones separated by thick, low permeability flow interiors. Interflow zones include the top of one flow, the base of an overlying flow, and intervening sediments where permeability and porosity are enhanced. Permeable interflow zones vary considerably in thickness and extent. Permeable interflow zones probably comprise less than 10 percent of the total flow thickness and the porosity of these zones is probably less than 25 percent. Therefore, bulk porosity of the Columbia River Basalt Unit probably averages less than 3 percent and perhaps as little as 1 percent. Well yields in the Columbia River Basalt Unit are moderate to high. Most high-capacity wells are open to multiple interflow zones. Large-diameter irrigation and public-supply wells commonly produce more than 250 gal/min (gallons per minute) and some are capable of 1,000 gal/min; smaller diameter domestic wells are generally capable of producing 20 gal/min.
  3. The Basement Confining Unit is composed of rocks in which most of the primary porosity has been destroyed by secondary mineralization. The Basement Confining Unit is characterized by low permeability, low porosity, and low well yield. Well yields are commonly less than 5 gal/min, and the unit is generally able to provide sufficient water for domestic uses only.

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Natural Features of the Helvetia Concept Plan Area

Helvetia Concept Planning Area

- The Helvetia Concept Planning Area north of Oregon Highway 26 (Sunset Highway), west of Helvetia Road from NW Jacobsen Road on the south to West Union Road on the north. The 270-acre Helvetia expansion area located at Township 1 North, Range 2 West, Section 15 (Figure VII .1). It lies within the City of Hillsboro's UGB.

Concept Plan Area Overview

Landscape characteristics of the Helvetia planning area:

- Topography is gently sloping to rolling, ranging from about 255 feet elevation in the eastern portion of the planning area to about 185 feet at the Waible Gulch floodplain (west)
- Flow of water and energy is generally from east to west; runoff flows to one of two tributaries to Waible Gulch which cross the planning area; both tributaries flow directly to Waible Gulch at the western edge of the planning area

Soil Survey of Washington County

The presence and distribution of soil types at the planning area suggest that lands are best suited to certain uses, or limited by slope steepness, erosion hazard, or other factors. Soil types range from silt loam and silty clay loam along lowland drainages to silt loam on adjacent higher areas; correspondingly, lowlands are characterized by frequent flooding, low productivity, and severe limitation for building site development; uplands have no flooding, high productivity, and moderate to severe limitations for building site development.

- Lowland soils along Waible Gulch and its two tributary drainages on the Helvetia planning area are primarily Dayton silt loam, or Cove or Verboort silty clay loams.
- Soils on adjacent uplands are Amity, Willamette, or Woodburn silt loams
- Steep slopes:
  - No surfaces with greater than 25% slope are found within the study area (Figure VII .4)
- Erosion hazard is:
  - Moderate to slight at Willamette and Woodburn silt loams
  - Slight at all other soil units in the planning area

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Washington County Comprehensive Plan

Washington County has identified significant natural resources in the planning area. These are shown on its Rural/Natural Resources Plan Significant Natural Resources map (mapped natural features are approximate, subject to refinement of boundaries through site assessment) (see Figure VII.2) and include the following:

- Water Area and Wetlands & Fish and Wildlife Habitat—Water areas and wetlands (i.e., 100-year floodplain, drainage hazard areas, and ponds) that are also fish and wildlife habitat:
  - Waible Gulch, including its floodplain and riparian corridor along the western boundary of the planning area
  - Tributary to Waible Gulch including its floodplain and riparian corridor north of NW Pubols Road
- Water Area and Wetlands—100-year floodplain, drainage hazard areas, and ponds, except those already developed:
  - Along western edge of planning area, associated with Waible Gulch drainage.
  - Along western portion of north tributary to Waible Gulch
- No other natural features are identified on the resources map

Clean Water Services' Sensitive Areas and Vegetated Corridors

The District's stormwater management program intends to improve water quality, protect fish habitat and manage drainage by operating and maintaining the stormwater conveyance system, establishing design and construction standards, regulating activities that can impact the watershed and enhancing streams and floodplains. The program regulates development activities in water quality sensitive areas, and in vegetated corridors along waters and wetlands, such as these features in the Helvetia planning area:

- Sensitive Areas include Waible Gulch, Waible Gulch tributaries; existing and created wetlands, ponds, and instream impoundments
- Vegetated Corridors include variable-width buffers adjacent to Sensitive Areas that protect the water quality functions of the water quality Sensitive Area
- Mapped Vegetated Corridors are only estimates. Exact determinations are made on a site at the time of development through the requirements of Clean Water Services' Design and Construction Standards and Washington County Community Development Code. Corridors may be adjusted based on slope, stream size, and status, or site conditions.

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National Wetlands Inventory

The National Wetlands Inventory Map for the Hillsboro, Oregon quadrangle – mapped by the USDI Fish and Wildlife Service (USFWS) - indicates that potential wetland features are associated with the Waible Gulch drainage along the western boundary of the Helvetia planning area and with a tributary to Waible Gulch in the northern portion of the Helvetia planning area:

- The channel of Waible Gulch is identified as a *palustrine emergent seasonally flooded excavated* (PEMCx) wetland
- The channel of the northern tributary to Waible Gulch is also identified as a *palustrine emergent seasonally flooded excavated* (PEMCx) wetland near its confluence with Waible Gulch
- Another portion of this same tributary is identified as a *palustrine forested temporarily flooded* (PFOA) wetland

Federally Listed T&E Species

The USFWS list of *Federally Listed Threatened, Endangered, Proposed, Candidate Species and Species of Concern Which May Occur in Washington County* identifies 16 listed, proposed, or candidate species that may occur in Washington County. Of those 16 species, five animals and six plants have the potential to occur in the vicinity of the Helvetia planning area:

Birds	
Bald eagle	T
Yellow-billed cuckoo	C
Streaked horned lark	C
Fish	
Steelhead (upper Willamette River)	T
Amphibians & Reptiles	
Oregon spotted frog	C
Plants	
Golden Indian paintbrush	T
Willamette daisy	E
Howellia	T
Bradshaw's lomatium	E
Kincaid's lupine	T
Nelson's checker mallow	T

E = Endangered
T = Threatened
C = Candidate

Continued on next page

Oregon Natural Heritage Information Center

The Oregon Natural Heritage Information Center (ORNHIC) list two records of state- or federally-listed species in the vicinity of the planning area. These records indicate Oregon Department of Fish and Wildlife fisheries biologists determined that steelhead (Upper Willamette River ESU, winter run)—federally listed as Threatened—previously were undocumented, but should be considered as potentially occurring in the Tualatin River and its tributaries and in McKay Creek and its tributaries.

The ORHNIC database contains no other records of federal or state listed species within two miles of the Helvetia planning area.

Continued on next page

Regulatory and Planning Constraints Imposed by Natural Features

Regulatory Constraints

The following is a preliminary list of potential environmental permitting requirements for implementing the Helvetia concept plan, and reflects potential federal, state, and local requirements.

The environmental considerations identified in this regulatory list should be considered preliminary; actual environmental effects and regulatory requirements will become better known after finalizing the plan and refining the natural features and their boundaries. Some permitting requirements may yet be identified, and others may be eliminated during plan development. The affected jurisdictions recommend pre-application meetings to refine possible permit requirements.

In some cases, permitting requirements are presumed at this conceptual level of project development, although uncertainty exists. Some regulated activities and requirements may only be fully understood after development plans are set because construction methods vary. Mitigation measures during construction can reduce environmental effects that cannot be avoided or minimized through engineering design. All of the regulations require some form of compensation for resources that would be impacted.

Federal

- Clean Water Act—for disturbances to waters and wetlands; also, effects on water quality
- Endangered Species Act/Magnuson-Stevens Act—for effects on listed threatened or endangered species, their habitats, and fisheries (e.g., steelhead trout)
- National Historic Preservation Act—for effects on cultural and historic resources

Oregon

- Oregon Wetland Removal/Fill Law—for disturbances to waters and wetlands
- Fish Passage Rule—for passage by native migratory fish

Clean Water Services District

- Design and Construction Standards & Service Provider Letters (SPL)—for impacts to vegetated corridors
- Site Development Permit—for erosion control and water quality protection

Washington County/City of Hillsboro

- Development Permit—for impacts to Significant Natural and Cultural Resources, including wildlife habitat, floodplains, and drainage hazard areas

Continued on next page

Tualatin Basin Fish and Wildlife Program

The Tualatin Basin Goal 5 Program is the result of a cooperative effort among Metro, Washington County, CWS, and cities in the Tualatin River Basin to develop a watershed approach that improves urban fish and wildlife habitat. The program is based upon an inventory of regionally significant Goal 5 fish and wildlife habitat conducted by Metro. The basin program was adopted by the specially-formed Tualatin Basin Natural Resources Coordinating Committee in April 2005, by Metro in September 2005, and is pending acknowledgment by LCDL based on a decision made in October 2006. Local jurisdictions are currently in the process of implementing initial program compliance efforts.

The program is non-traditional in the sense that it is based upon cooperative proactive efforts, incentives, and investment rather than on regulation of natural resources areas. Nonetheless, there is a regulatory aspect to the efforts which focuses on allowing and encouraging habitat-friendly development practices and low impact development techniques. The Basin program recognizes that fish and wildlife habitat in riparian resource areas is potentially affected by activities that impact water quality, and that these activities can occur anywhere in the watershed – not just in identified resource areas. The program therefore describes three general categories of land possibly occurring in the planning area (subject to field delineation) and described below.

- <u>Strictly Limit</u> (SL) is applied to areas where existing protection and conservation measures are already in place which restrict development, consistent with Clean Water Services' standards for Vegetated Corridors (generally 50 feet or wider buffers along streams and 125-foot buffers along the Tualatin River, with requirements for enhancement of degraded conditions).
- <u>Moderately Limit</u> (ML) is applied to Class I and II Riparian resource areas identified in Metro's Goal 5 inventory which fall beyond Vegetated Corridor buffers. For such natural areas, conservation and restoration area encouraged, and the revenue tools the Basin has at its disposal will be directed to help make such conservation and restoration happen. These revenue tools include a $95 million investment with the Partners' plan to spend on stream system improvements over the next 20 years, under the guidance of Clean Water Services' Healthy Streams Plan. Program efforts applicable to the SL and ML areas are intended to protect and improve critical core urban habitat areas throughout the basin.
- <u>Lightly Limit</u> (LL) is applied to all other classes of habitat resource identified in Metro's inventory. Protection efforts for LL resource areas

are discretionary, primarily relying upon incentives to encourage property owners and developers to preserve and improve conditions in these areas. This can be achieved in a variety of ways, some of which may yet be determined through concept planning for new urban areas.

The LL designation also applies to non-resource areas within the basin, in effect including the entire urban watershed. For these areas, low-impact development practices are encouraged through education and incentives. The program recognizes new urban areas as an opportunity to explore a mores comprehensive approach to mitigating environmental impacts of storm water.

City of Hillsboro

As of May 2, 2006, the City of Hillsboro had not annexed the Helvetia planning area nor revised its Significant Natural Resources Overlay District map to include the planning area.

On January 5, 2007, the City of Hillsboro proposed text amendments to the Hillsboro Comprehensive Plan (HCP), Zoning & Subdivision Ordinances (ZOA and SOA) related to implementation of the Tualatin Basin Fish & Wildlife Program to comply with Metro Urban Growth Management Functional Plan, Title 13: Nature in Neighborhoods.

There are no additional regulations being proposed for the Tualatin Basin Program. The regulatory component of the Program consists of existing CWS Design & Construction standards/vegetated corridor requirements applicable to proposed development and redevelopment activities within and adjacent to areas designated as Water Quality Sensitive Areas. The Program is intended to convey a benefit to the developer in exchange for the use of habitat-friendly development practices. It is not intended to increase development restrictions. Use of the habitat friendly development standards would be at the option of the developer/property owner.

The Tualatin Basin Program encourages the use of environmentally sensitive site design and construction practices throughout the watershed in order to reduce the impact of new development on fish and wildlife habitat in the basin, and to aid in improving environmental health. These design and construction practices include a variety of techniques known collectively as Habitat Friendly Development. A subset of Habitat Friendly Development is Low Impact Development (LID) which includes methods of reducing stormwater runoff and the overloading of storm sewers through the integration of open space and pervious surfaces into new development or existing development through retrofitting.

The Tualatin Basin Goal 5 Program Report recognizes that most jurisdictions in the Basin will need to remove barriers in their existing regulations in order to allow for a Habitat Friendly/LID approach to meeting stormwater management requirements. The proposed HCP, ZOA, and SOA amendments will fulfill Hillsboro’s obligation under the Tualatin Basin Natural Resources Coordinating Committee’s Intergovernmental Agreement with Metro to remove barriers to utilization of LID techniques and to encourage and facilitate the use of other habitat-friendly development practices.

Continued on next page

References

References

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Appendix C

Cultural Resources Report

Cultural Resources

Introduction

The Evergreen and Helvetia Road planning areas are located northeast of downtown Hillsboro, Oregon (Figure VIII.1). A file search was conducted at the Oregon State Historic Preservation Office to identify previously recorded sites or resources. General Land Office (GLO) maps were examined for the area to identify early Donation Land Claims. Additional research was conducted at the Washington County Historical Museum and the Oregon Historical Society. No intensive surface or archaeological field surveys were conducted for this assessment.

Helvetia Parcel - *Figure VIII.1*

No systematic archaeological surveys have been conducted in this parcel. This area is part of the original D. T. Lennox Donation Land Claim (DLC)(General Land Office 1862). Lennox was born in 1802 in Catskill, New York and settled his claim in Washington County in 1844. A review of abstracts from applications for Donation Land Claims shows Lennox to have been a prominent and active member of the community (Genealogical Forum of Portland 1957).

Two notable landmarks are present on lands adjacent to the Helvetia Parcel: West Union Baptist Church and the Five Oaks Meeting Place.

West Union Baptist Church and Cemetery - Constructed in 1844 on land donated by D.T. Lennox, the church is notable for being the first Baptist Church west of the Rocky Mountains. The church is located in the northwest quadrant of the intersection of West Union Road and Dick Road. The church is listed on the National Register of Historic Places. D. T. Lennox is buried in the adjacent church cemetery.

Five Oaks Meeting place - This location, originally the site of five large Oregon White Oaks, is located on the Alexander Zachary DLC (General Land Office 1862). It is a locally significant historic site known as a meeting place for local historic figure Joseph Meek and other early mountain men and settlers. Parades, picnics, religious meetings horse races and sessions of the County Court were all held at this location as late as the early 1900s. Two of the original five oaks remain on the site. The site is located just south of the Helvetia Parcel off of Casper Place and is marked by an informational kiosk.

Summary and Recommendations

No systematic archaeological or cultural surveys have been conducted within the Helvetia parcel. A search of the State Historic Preservation Office, The Washington County Museum, and the Oregon Historical Society, identified no significant historic, or archaeological properties or resources within the parcel. It is possible that future surveys could identify significant resources. Two historic properties are present on lands adjacent to the Helvetia parcel: The West Union Baptist Church, and the Five Oaks Meeting Place. The West Union Baptist Church is listed on the National Register of Historic Places. The Five Oaks Meeting place currently has an informational kiosk marking the location.

Figure 2: West Union Baptist Church

Figure 3: Five Oaks Meeting Place

Cited References

Genealogical Forum of Portland

1957 *Genealogical Material in Oregon Donation Land Claims;* Vol. 1, Oregon City Land Office, Claims 1-2500. On file at the Washington County Museum.

General Land Office (GLO)

1862 Plat of Township No. 1 North, Range No. 2 West, Willamette Meridian. http://libweb.uoregon.edu/map/GIS/Data/Oregon/GLO

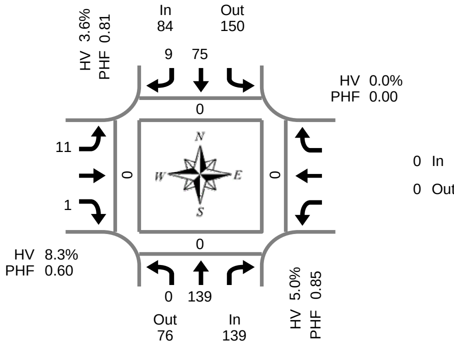
Appendix D

Traffic Volumes and Level of Service Calculations

Appendix D

Total Vehicle Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740



NW Helvetia Rd & NW West Union Rd North

Tuesday, February 13, 2007

4:00 PM to 6:00 PM

Peak Hour Summary
4:30 PM to 5:30 PM

5-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound NW Helvetia Rd			Southbound NW Helvetia Rd			Eastbound NW West Union Rd North			Westbound NW West Union Rd North	Interval Total	Pedestrians Crosswalk			
	L	T	Bikes	T	R	Bikes	L	R	Bikes	Bikes		North	South	East	West
4:00 PM	0	7	0	4	3	0	0	0	0	0	14	0	0	0	0
4:05 PM	0	3	0	6	1	0	0	0	0	0	10	0	0	0	0
4:10 PM	1	6	0	2	1	0	1	0	0	0	11	0	0	0	0
4:15 PM	0	4	0	12	0	0	0	0	0	0	16	0	0	0	0
4:20 PM	1	16	0	7	1	0	1	0	0	0	26	0	0	0	0
4:25 PM	0	6	0	7	0	0	0	1	0	0	14	0	0	0	0
4:30 PM	0	10	0	8	1	0	0	0	0	0	19	0	0	0	0
4:35 PM	0	14	0	6	2	0	2	0	0	0	24	0	0	0	0
4:40 PM	0	9	1	2	0	0	2	0	0	0	13	0	0	0	0
4:45 PM	0	15	0	11	1	0	1	0	0	0	28	0	0	0	0
4:50 PM	0	12	0	4	0	0	1	0	0	0	17	0	0	0	0
4:55 PM	0	10	0	10	0	0	0	0	0	0	20	0	0	0	0
5:00 PM	0	12	0	3	1	0	1	0	0	0	17	0	0	0	0
5:05 PM	0	11	0	6	2	0	0	0	0	0	19	0	0	0	0
5:10 PM	0	5	0	5	0	0	2	0	0	0	12	0	0	0	0
5:15 PM	0	14	0	8	0	0	0	0	0	0	22	0	0	0	0
5:20 PM	0	15	0	2	1	0	2	0	0	0	20	0	0	0	0
5:25 PM	0	12	0	10	1	0	0	1	0	0	24	0	0	0	0
5:30 PM	1	8	0	2	0	0	0	0	0	0	11	0	0	0	0
5:35 PM	0	14	0	13	0	0	1	0	0	0	28	0	0	0	0
5:40 PM	0	10	0	5	1	0	0	0	0	0	16	0	0	0	0
5:45 PM	0	7	0	1	0	0	1	0	0	0	9	0	0	0	0
5:50 PM	0	9	0	8	2	0	2	0	0	0	21	0	0	0	0
5:55 PM	0	13	0	5	0	0	0	0	0	0	18	0	0	0	0
Total Survey	3	242	1	147	18	0	17	2	0	0	429	0	0	0	0

15-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound NW Helvetia Rd			Southbound NW Helvetia Rd			Eastbound NW West Union Rd North			Westbound NW West Union Rd North	Interval Total	Pedestrians Crosswalk			
	L	T	Bikes	T	R	Bikes	L	R	Bikes	Bikes		North	South	East	West
4:00 PM	1	16	0	12	5	0	1	0	0	0	35	0	0	0	0
4:15 PM	1	26	0	26	1	0	1	1	0	0	56	0	0	0	0
4:30 PM	0	33	1	16	3	0	4	0	0	0	56	0	0	0	0
4:45 PM	0	37	0	25	1	0	2	0	0	0	65	0	0	0	0
5:00 PM	0	28	0	14	3	0	3	0	0	0	48	0	0	0	0
5:15 PM	0	41	0	20	2	0	2	1	0	0	66	0	0	0	0
5:30 PM	1	32	0	20	1	0	1	0	0	0	55	0	0	0	0
5:45 PM	0	29	0	14	2	0	3	0	0	0	48	0	0	0	0
Total Survey	3	242	1	147	18	0	17	2	0	0	429	0	0	0	0

Peak Hour Summary
4:30 PM to 5:30 PM

By Approach	Northbound NW Helvetia Rd				Southbound NW Helvetia Rd				Eastbound NW West Union Rd North				Westbound NW West Union Rd North				Total
	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes	
Volume	139	76	215	1	84	150	234	0	12	9	21	0	0	0	0	0	235
%HV	5.0%				3.6%				8.3%				0.0%				4.7%
PHF	0.85				0.81				0.60				0.00				0.89

Pedestrians Crosswalk			
North	South	East	West
0	0	0	0

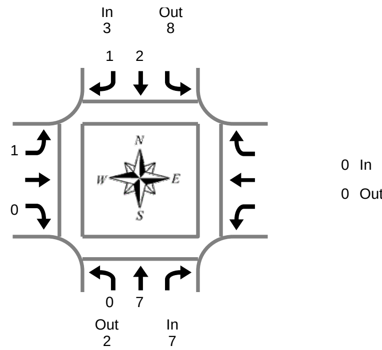
By Movement	Northbound NW Helvetia Rd				Southbound NW Helvetia Rd				Eastbound NW West Union Rd North				Westbound NW West Union Rd North				Total
	L	T		Total		T	R	Total	L		R	Total				Total	
Volume	0	139		139		75	9	84	11		1	12				0	235
%HV	0.0%	5.0%	NA	5.0%	NA	2.7%	11.1%	3.6%	9.1%	NA	0.0%	8.3%	NA	NA	NA	0.0%	4.7%
PHF	0.00	0.85		0.85		0.75	0.75	0.81	0.55		0.25	0.60				0.00	0.89

Rolling Hour Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound NW Helvetia Rd			Southbound NW Helvetia Rd			Eastbound NW West Union Rd North			Westbound NW West Union Rd North	Interval Total	Pedestrians Crosswalk			
	L	T	Bikes	T	R	Bikes	L	R	Bikes	Bikes		North	South	East	West
4:00 PM	2	112	1	79	10	0	8	1	0	0	212	0	0	0	0
4:15 PM	1	124	1	81	8	0	10	1	0	0	225	0	0	0	0
4:30 PM	0	139	1	75	9	0	11	1	0	0	235	0	0	0	0
4:45 PM	1	138	0	79	7	0	8	1	0	0	234	0	0	0	0
5:00 PM	1	130	0	68	8	0	9	1	0	0	217	0	0	0	0

Heavy Vehicle Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740



Peak Hour Summary
4:30 PM to 5:30 PM

NW Helvetia Rd & NW West Union Rd North

Tuesday, February 13, 2007
4:00 PM to 6:00 PM

Heavy Vehicle 5-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound NW Helvetia Rd			Southbound NW Helvetia Rd			Eastbound NW West Union Rd North			Westbound NW West Union Rd North	Interval Total
	L	T	Total	T	R	Total	L	R	Total	Total	
4:00 PM	0	0	0	0	0	0	0	0	0	0	0
4:05 PM	0	0	0	0	0	0	0	0	0	0	0
4:10 PM	0	1	1	0	0	0	0	0	0	0	1
4:15 PM	0	0	0	1	0	1	0	0	0	0	1
4:20 PM	0	0	0	0	0	0	0	0	0	0	0
4:25 PM	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	1	1	0	0	0	0	0	0	0	1
4:35 PM	0	0	0	0	0	0	0	0	0	0	0
4:40 PM	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	1	0	1	1	0	1	0	2
4:50 PM	0	1	1	0	0	0	0	0	0	0	1
4:55 PM	0	1	1	0	0	0	0	0	0	0	1
5:00 PM	0	0	0	0	0	0	0	0	0	0	0
5:05 PM	0	1	1	0	1	1	0	0	0	0	2
5:10 PM	0	2	2	0	0	0	0	0	0	0	2
5:15 PM	0	0	0	1	0	1	0	0	0	0	1
5:20 PM	0	1	1	0	0	0	0	0	0	0	1
5:25 PM	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	1	1	0	0	0	0	0	0	0	1
5:35 PM	0	0	0	0	0	0	0	0	0	0	0
5:40 PM	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0
5:50 PM	0	1	1	0	0	0	0	0	0	0	1
5:55 PM	0	0	0	0	0	0	0	0	0	0	0
Total Survey	0	10	10	3	1	4	1	0	1	0	15

Heavy Vehicle 15-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound NW Helvetia Rd			Southbound NW Helvetia Rd			Eastbound NW West Union Rd North			Westbound NW West Union Rd North	Interval Total
	L	T	Total	T	R	Total	L	R	Total	Total	
4:00 PM	0	1	1	0	0	0	0	0	0	0	1
4:15 PM	0	0	0	1	0	1	0	0	0	0	1
4:30 PM	0	1	1	0	0	0	0	0	0	0	1
4:45 PM	0	2	2	1	0	1	1	0	1	0	4
5:00 PM	0	3	3	0	1	1	0	0	0	0	4
5:15 PM	0	1	1	1	0	1	0	0	0	0	2
5:30 PM	0	1	1	0	0	0	0	0	0	0	1
5:45 PM	0	1	1	0	0	0	0	0	0	0	1
Total Survey	0	10	10	3	1	4	1	0	1	0	15

Heavy Vehicle Peak Hour Summary
4:30 PM to 5:30 PM

By Approach	Northbound NW Helvetia Rd			Southbound NW Helvetia Rd			Eastbound NW West Union Rd North			Westbound NW West Union Rd North			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	7	2	9	3	8	11	1	1	2	0	0	0	11
PHF	0.58			0.38			0.25			0.00			0.55

By Movement	Northbound NW Helvetia Rd			Southbound NW Helvetia Rd			Eastbound NW West Union Rd North			Westbound NW West Union Rd North	Total
	L	T	Total	T	R	Total	L	R	Total	Total	
Volume	0	7	7	2	1	3	1	0	1	0	11
PHF	0.00	0.58	0.58	0.50	0.25	0.38	0.25	0.00	0.25	0.00	0.55

Heavy Vehicle Rolling Hour Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound NW Helvetia Rd			Southbound NW Helvetia Rd			Eastbound NW West Union Rd North			Westbound NW West Union Rd North	Interval Total
	L	T	Total	T	R	Total	L	R	Total	Total	
4:00 PM	0	4	4	2	0	2	1	0	1	0	7
4:15 PM	0	6	6	2	1	3	1	0	1	0	10
4:30 PM	0	7	7	2	1	3	1	0	1	0	11
4:45 PM	0	7	7	2	1	3	1	0	1	0	11
5:00 PM	0	6	6	1	1	2	0	0	0	0	8

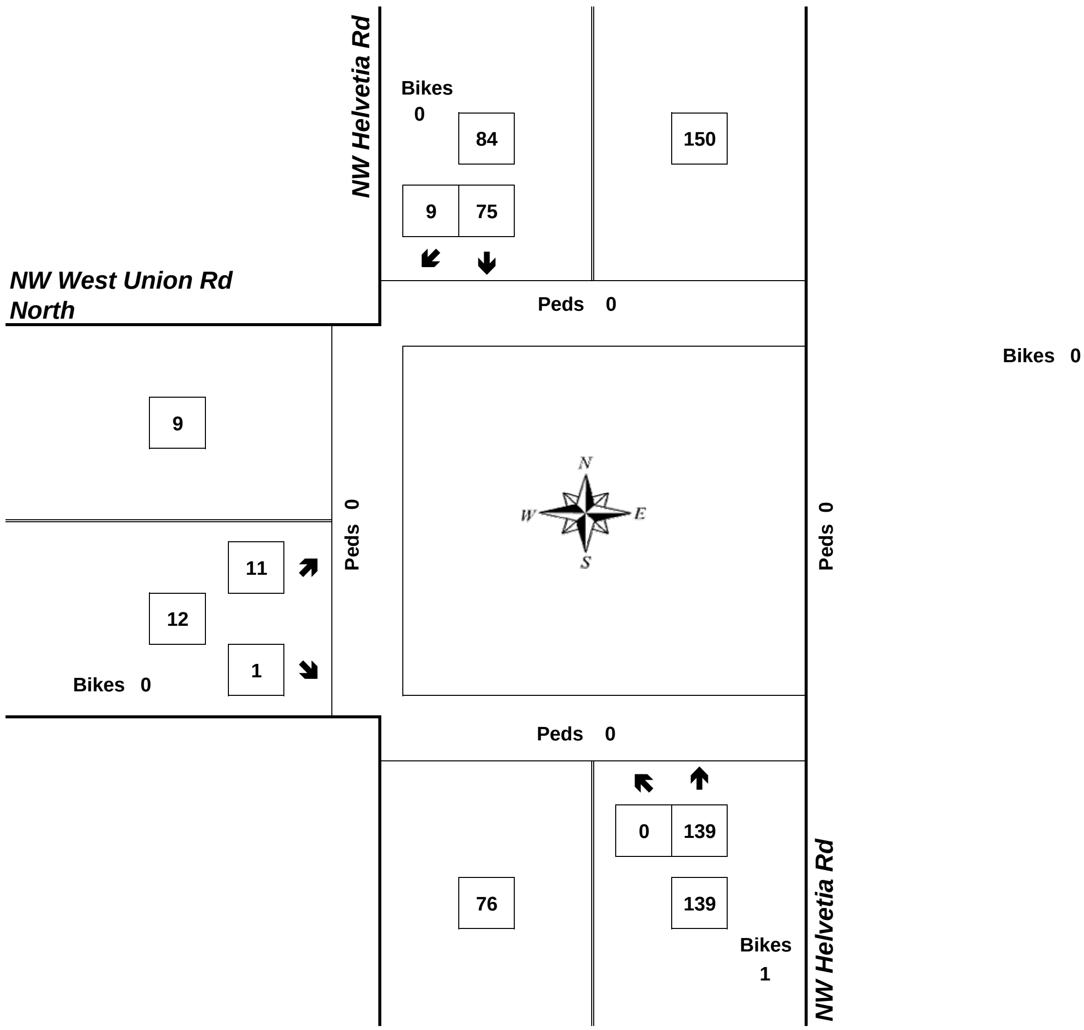
Peak Hour Summary

All Traffic Data Services Inc.

Clay Carney
(503) 833-2740

NW Helvetia Rd & NW West Union Rd North

4:30 PM to 5:30 PM
Tuesday, February 13, 2007

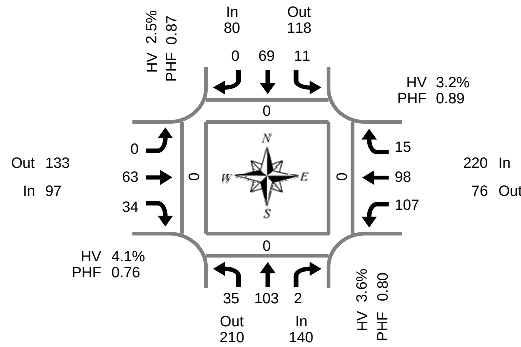


Approach	PHF	HV%	Volume
EB	0.60	8.3%	12
WB	0.00	0.0%	0
NB	0.85	5.0%	139
SB	0.81	3.6%	84
Intersection	0.89	4.7%	235

Count Period: 4:00 PM to 6:00 PM

Total Vehicle Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740



Peak Hour Summary
4:05 PM to 5:05 PM

NW Helvetia Rd & NW West Union Rd

Tuesday, February 13, 2007
4:00 PM to 6:00 PM

5-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound NW Helvetia Rd L	T	R	Bikes	Southbound NW Helvetia Rd L	T	R	Bikes	Eastbound NW West Union Rd L	T	R	Bikes	Westbound NW West Union Rd L	T	R	Bikes	Interval Total	Pedestrians Crosswalk North	South	East	West
4:00 PM	5	3	1	0	1	2	0	0	0	4	2	0	5	4	2	0	29	0	0	0	0
4:05 PM	2	2	0	0	0	7	0	0	0	4	3	0	6	6	0	0	30	0	0	0	0
4:10 PM	3	6	0	0	1	5	0	0	0	4	2	0	8	7	1	0	37	0	0	0	0
4:15 PM	3	4	0	0	1	6	0	0	0	3	5	0	14	8	1	0	45	0	0	0	0
4:20 PM	4	11	0	0	1	6	0	0	0	8	4	0	8	10	1	0	53	0	0	0	0
4:25 PM	2	9	0	0	1	7	0	0	0	4	2	0	9	10	1	0	45	0	0	0	0
4:30 PM	6	8	0	0	1	5	0	0	0	9	5	0	8	11	3	0	56	0	0	0	0
4:35 PM	3	13	1	0	1	8	0	0	0	3	4	0	13	6	0	0	52	0	0	0	0
4:40 PM	1	7	0	1	0	4	0	0	0	2	1	0	9	6	2	0	32	0	0	0	0
4:45 PM	5	14	0	0	3	6	0	0	0	9	2	0	11	13	1	0	64	0	0	0	0
4:50 PM	2	13	0	0	1	3	0	0	0	7	3	0	7	7	2	0	45	0	0	0	0
4:55 PM	3	6	0	0	0	8	0	0	0	5	1	0	6	9	0	0	38	0	0	0	0
5:00 PM	1	10	1	1	1	4	0	0	0	5	2	0	8	5	3	0	40	0	0	0	0
5:05 PM	3	5	0	0	0	3	0	0	0	3	2	0	5	3	2	0	26	0	0	0	0
5:10 PM	3	8	0	0	3	6	0	0	0	4	3	0	4	4	1	0	36	0	0	0	0
5:15 PM	5	11	0	0	0	8	0	0	0	5	2	0	3	4	2	0	40	0	0	0	0
5:20 PM	1	15	1	0	2	2	0	0	0	4	1	1	6	2	1	0	35	0	0	0	0
5:25 PM	6	12	0	0	1	7	0	0	0	9	1	0	9	13	0	0	58	0	0	0	0
5:30 PM	7	10	0	0	1	6	0	0	0	5	3	0	7	11	1	0	51	0	0	0	0
5:35 PM	3	11	0	0	0	8	0	0	0	7	2	0	5	8	2	0	46	0	0	0	0
5:40 PM	4	8	0	0	2	3	0	0	0	10	4	0	3	3	2	0	39	0	0	0	0
5:45 PM	3	7	0	0	0	2	0	0	0	3	1	0	10	10	2	0	38	0	0	0	0
5:50 PM	4	4	0	0	2	5	0	0	0	4	1	0	7	4	2	0	33	0	0	0	0
5:55 PM	5	9	1	0	1	4	0	0	0	8	2	0	6	15	3	0	54	0	0	0	0
Total Survey	84	206	5	2	24	125	0	0	0	129	58	1	177	179	35	0	1,022	0	0	0	0

15-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound NW Helvetia Rd L	T	R	Bikes	Southbound NW Helvetia Rd L	T	R	Bikes	Eastbound NW West Union Rd L	T	R	Bikes	Westbound NW West Union Rd L	T	R	Bikes	Interval Total	Pedestrians Crosswalk North	South	East	West
4:00 PM	10	11	1	0	2	14	0	0	0	12	7	0	19	17	3	0	96	0	0	0	0
4:15 PM	9	24	0	0	3	19	0	0	0	15	11	0	31	28	3	0	143	0	0	0	0
4:30 PM	10	28	1	1	2	17	0	0	0	14	10	0	30	23	5	0	140	0	0	0	0
4:45 PM	10	33	0	0	4	17	0	0	0	21	6	0	24	29	3	0	147	0	0	0	0
5:00 PM	7	23	1	1	4	13	0	0	0	12	7	0	17	12	6	0	102	0	0	0	0
5:15 PM	12	38	1	0	3	17	0	0	0	18	4	1	18	19	3	0	133	0	0	0	0
5:30 PM	14	29	0	0	3	17	0	0	0	22	9	0	15	22	5	0	136	0	0	0	0
5:45 PM	12	20	1	0	3	11	0	0	0	15	4	0	23	29	7	0	125	0	0	0	0
Total Survey	84	206	5	2	24	125	0	0	0	129	58	1	177	179	35	0	1,022	0	0	0	0

Peak Hour Summary
4:05 PM to 5:05 PM

By Approach	Northbound NW Helvetia Rd In	Out	Total	Bikes	Southbound NW Helvetia Rd In	Out	Total	Bikes	Eastbound NW West Union Rd In	Out	Total	Bikes	Westbound NW West Union Rd In	Out	Total	Bikes	Total	Pedestrians Crosswalk North	South	East	West
Volume	140	210	350	2	80	118	198	0	97	133	230	0	220	76	296	0	537	0	0	0	0
%HV	3.6%				2.5%				4.1%				3.2%				3.4%				
PHF	0.80				0.87				0.76				0.89				0.87				

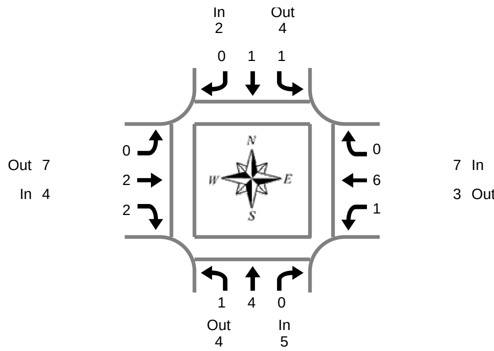
By Movement	Northbound NW Helvetia Rd L	T	R	Total	Southbound NW Helvetia Rd L	T	R	Total	Eastbound NW West Union Rd L	T	R	Total	Westbound NW West Union Rd L	T	R	Total	Total
Volume	35	103	2	140	11	69	0	80	0	63	34	97	107	98	15	220	537
%HV	2.9%	3.9%	0.0%	3.6%	9.1%	1.4%	0.0%	2.5%	0.0%	3.2%	5.9%	4.1%	0.9%	6.1%	0.0%	3.2%	3.4%
PHF	0.73	0.76	0.50	0.80	0.69	0.86	0.00	0.87	0.00	0.75	0.77	0.76	0.81	0.79	0.75	0.89	0.87

Rolling Hour Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound NW Helvetia Rd L	T	R	Bikes	Southbound NW Helvetia Rd L	T	R	Bikes	Eastbound NW West Union Rd L	T	R	Bikes	Westbound NW West Union Rd L	T	R	Bikes	Interval Total	Pedestrians Crosswalk North	South	East	West
4:00 PM	39	96	2	1	11	67	0	0	0	62	34	0	104	97	14	0	526	0	0	0	0
4:15 PM	36	108	2	2	13	66	0	0	0	62	34	0	102	92	17	0	532	0	0	0	0
4:30 PM	39	122	3	2	13	64	0	0	0	65	27	1	89	83	17	0	522	0	0	0	0
4:45 PM	43	123	2	1	14	64	0	0	0	73	26	1	74	82	17	0	518	0	0	0	0
5:00 PM	45	110	3	1	13	58	0	0	0	67	24	1	73	82	21	0	496	0	0	0	0

Heavy Vehicle Summary

Clay Carney
(503) 833-2740



Peak Hour Summary
4:05 PM to 5:05 PM

NW Helvetia Rd & NW West Union Rd

Tuesday, February 13, 2007
4:00 PM to 6:00 PM

Heavy Vehicle 5-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound NW Helvetia Rd				Southbound NW Helvetia Rd				Eastbound NW West Union Rd				Westbound NW West Union Rd				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
4:00 PM	2	0	0	2	0	0	0	0	0	0	0	0	0	1	0	1	3
4:05 PM	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	1
4:10 PM	0	1	0	1	0	0	0	0	0	0	0	0	0	2	0	2	3
4:15 PM	0	0	0	0	0	1	0	1	0	1	0	1	0	1	0	1	3
4:20 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:25 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
4:30 PM	1	0	0	1	0	0	0	0	0	0	0	0	1	0	0	1	2
4:35 PM	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
4:40 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	1	0	0	1	0	1	0	1	0	1	0	1	3
4:50 PM	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
4:55 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	1	0	1	0	0	0	0	0	0	1	1	0	1	0	1	3
5:05 PM	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	2	2
5:10 PM	0	1	0	1	0	0	0	0	0	0	0	0	0	0	1	1	2
5:15 PM	0	0	0	0	0	1	0	1	0	1	0	1	0	1	0	1	3
5:20 PM	0	1	0	1	0	0	0	0	0	1	0	1	0	0	0	0	2
5:25 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
5:35 PM	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
5:40 PM	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	1
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:50 PM	0	0	0	0	0	0	0	0	0	1	0	1	1	0	0	1	2
5:55 PM	0	1	0	1	0	0	0	0	0	0	0	0	0	1	0	1	2
Total Survey	4	8	0	12	1	2	0	3	0	5	3	8	3	9	2	14	37

Heavy Vehicle 15-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound NW Helvetia Rd				Southbound NW Helvetia Rd				Eastbound NW West Union Rd				Westbound NW West Union Rd				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
4:00 PM	2	1	0	3	0	0	0	0	0	0	1	1	0	3	0	3	7
4:15 PM	0	0	0	0	0	1	0	1	0	1	0	1	0	2	0	2	4
4:30 PM	1	1	0	2	0	0	0	0	0	0	0	0	1	0	0	1	3
4:45 PM	0	1	0	1	1	0	0	1	0	1	0	1	0	1	0	1	4
5:00 PM	0	2	0	2	0	0	0	0	0	0	1	1	1	1	2	4	7
5:15 PM	0	1	0	1	0	1	0	1	0	2	0	2	0	1	0	1	5
5:30 PM	1	1	0	2	0	0	0	0	0	0	1	1	0	0	0	0	3
5:45 PM	0	1	0	1	0	0	0	0	0	1	0	1	1	1	0	2	4
Total Survey	4	8	0	12	1	2	0	3	0	5	3	8	3	9	2	14	37

Heavy Vehicle Peak Hour Summary
4:05 PM to 5:05 PM

By Approach	Northbound NW Helvetia Rd			Southbound NW Helvetia Rd			Eastbound NW West Union Rd			Westbound NW West Union Rd			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	5	4	9	2	4	6	4	7	11	7	3	10	18
PHF	0.63			0.50			0.50			0.58			0.64

By Movement	Northbound NW Helvetia Rd				Southbound NW Helvetia Rd				Eastbound NW West Union Rd				Westbound NW West Union Rd				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	1	4	0	5	1	1	0	2	0	2	2	4	1	6	0	7	18
PHF	0.25	0.50	0.00	0.63	0.25	0.25	0.00	0.50	0.00	0.50	0.50	0.50	0.25	0.50	0.00	0.58	0.64

Heavy Vehicle Rolling Hour Summary
4:00 PM to 6:00 PM

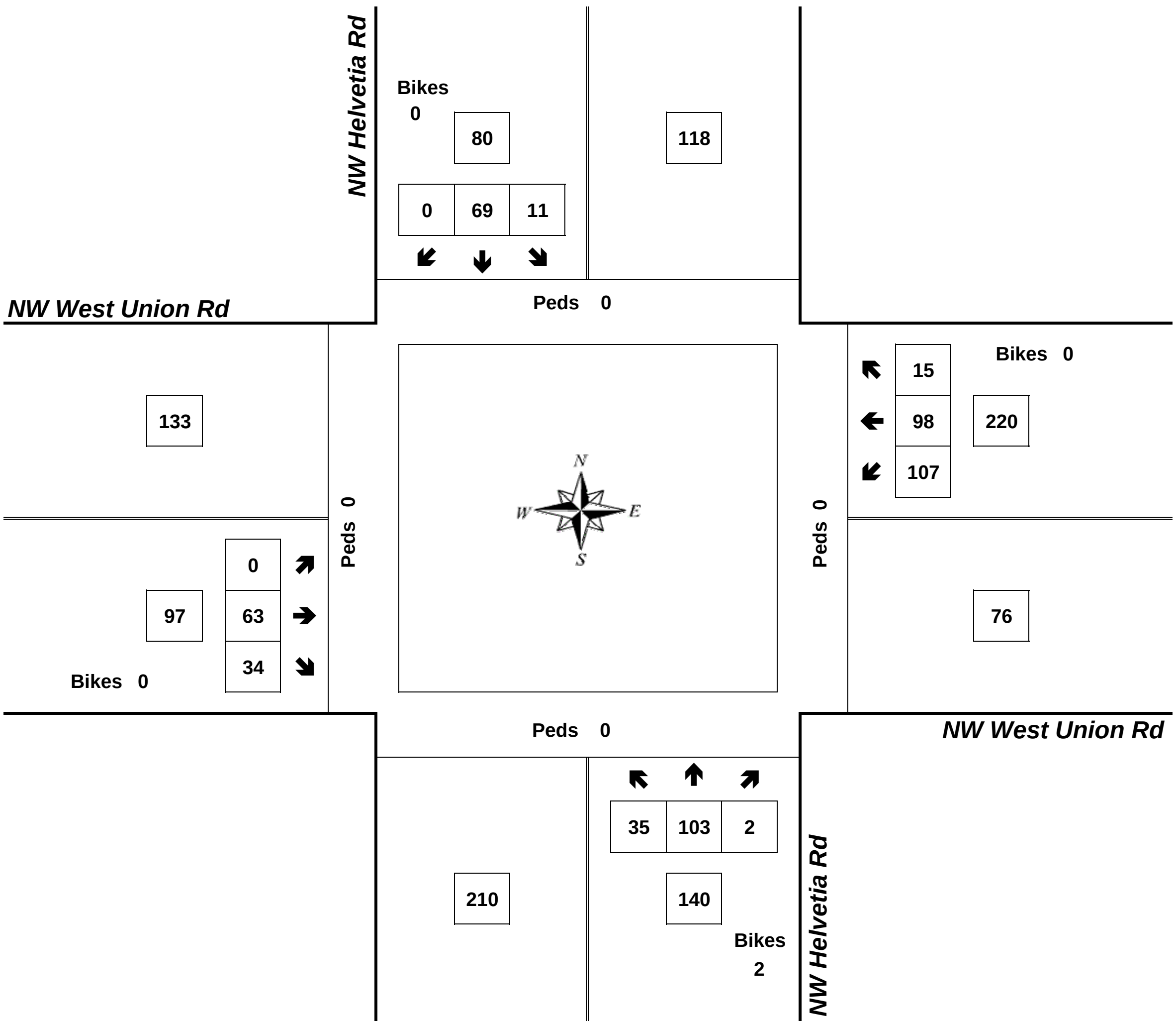
Interval Start Time	Northbound NW Helvetia Rd				Southbound NW Helvetia Rd				Eastbound NW West Union Rd				Westbound NW West Union Rd				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
4:00 PM	3	3	0	6	1	1	0	2	0	2	1	3	1	6	0	7	18
4:15 PM	1	4	0	5	1	1	0	2	0	2	1	3	2	4	2	8	18
4:30 PM	1	5	0	6	1	1	0	2	0	3	1	4	2	3	2	7	19
4:45 PM	1	5	0	6	1	1	0	2	0	3	2	5	1	3	2	6	19
5:00 PM	1	5	0	6	0	1	0	1	0	3	2	5	2	3	2	7	19

Peak Hour Summary

Clay Carney
(503) 833-2740

NW Helvetia Rd & NW West Union Rd

4:05 PM to 5:05 PM
Tuesday, February 13, 2007

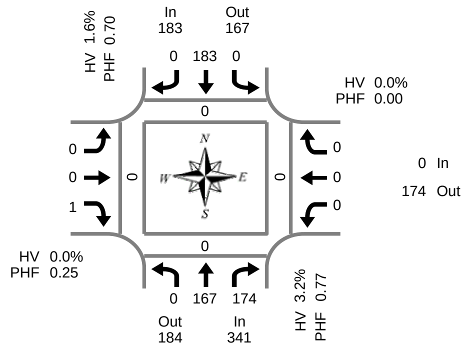


Approach	PHF	HV%	Volume
EB	0.76	4.1%	97
WB	0.89	3.2%	220
NB	0.80	3.6%	140
SB	0.87	2.5%	80
Intersection	0.87	3.4%	537

Count Period: 4:00 PM to 6:00 PM

Total Vehicle Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740



NW Helvetia Rd & NW West Union Rd South

Tuesday, February 13, 2007
4:00 PM to 6:00 PM

Peak Hour Summary
4:35 PM to 5:35 PM

5-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound NW Helvetia Rd				Southbound NW Helvetia Rd				Eastbound NW West Union Rd South				Westbound NW West Union Rd South				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
4:00 PM	0	10	12	0	0	11	0	0	0	0	0	0	0	0	0	0	33	0	0	0	0
4:05 PM	0	3	7	0	0	16	0	0	0	0	0	0	0	0	0	0	26	0	0	0	0
4:10 PM	0	9	11	0	0	17	0	0	0	0	0	0	0	0	0	0	37	0	0	0	0
4:15 PM	0	10	7	0	0	24	0	0	0	0	0	0	0	0	0	0	41	0	0	0	0
4:20 PM	0	11	8	0	0	18	0	0	0	0	0	0	0	0	0	0	37	0	0	0	0
4:25 PM	0	11	9	0	0	18	0	0	0	0	0	0	0	0	0	0	38	0	0	0	0
4:30 PM	0	14	12	0	0	13	0	0	0	0	0	0	0	0	0	0	39	0	0	0	0
4:35 PM	0	15	15	0	0	29	0	0	0	0	0	0	0	0	0	0	59	0	0	0	0
4:40 PM	0	10	16	1	0	15	0	0	0	0	0	0	0	0	0	0	41	0	0	0	0
4:45 PM	0	17	12	0	0	21	0	0	0	0	0	0	0	0	0	0	50	0	0	0	0
4:50 PM	0	16	12	0	0	11	0	0	0	0	0	0	0	0	0	0	39	0	0	0	0
4:55 PM	0	9	9	0	0	16	0	0	0	0	0	0	0	0	0	0	34	0	0	0	0
5:00 PM	0	9	11	1	0	13	0	0	0	0	0	0	0	0	0	0	33	0	0	0	0
5:05 PM	0	11	15	0	0	10	0	0	0	0	0	0	0	0	0	0	36	0	0	0	0
5:10 PM	0	10	18	0	0	11	0	0	0	0	0	0	0	0	0	0	39	0	0	0	0
5:15 PM	0	19	21	0	0	13	0	0	0	0	1	0	0	0	0	0	54	0	0	0	0
5:20 PM	0	16	21	0	0	10	0	0	0	0	0	0	0	0	0	0	47	0	0	0	0
5:25 PM	0	21	13	0	0	16	0	0	0	0	0	0	0	0	0	0	50	0	0	0	0
5:30 PM	0	14	11	0	0	18	0	0	0	0	0	0	0	0	0	0	43	0	0	0	0
5:35 PM	0	15	17	0	0	17	0	0	0	0	0	0	0	0	0	0	49	0	0	0	0
5:40 PM	0	10	25	0	0	8	0	0	0	0	0	0	0	0	0	0	43	0	0	0	0
5:45 PM	0	10	16	0	0	13	0	0	0	0	0	0	0	0	0	0	39	0	0	0	0
5:50 PM	0	10	11	0	0	10	0	0	0	0	0	0	0	0	0	0	31	0	0	0	0
5:55 PM	0	13	9	0	0	16	0	0	0	0	0	0	0	0	0	0	38	0	0	0	0
Total Survey	0	293	318	2	0	364	0	0	0	0	1	0	0	0	0	0	976	0	0	0	0

15-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound NW Helvetia Rd				Southbound NW Helvetia Rd				Eastbound NW West Union Rd South				Westbound NW West Union Rd South				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
4:00 PM	0	22	30	0	0	44	0	0	0	0	0	0	0	0	0	0	96	0	0	0	0
4:15 PM	0	32	24	0	0	60	0	0	0	0	0	0	0	0	0	0	116	0	0	0	0
4:30 PM	0	39	43	1	0	57	0	0	0	0	0	0	0	0	0	0	139	0	0	0	0
4:45 PM	0	42	33	0	0	48	0	0	0	0	0	0	0	0	0	0	123	0	0	0	0
5:00 PM	0	30	44	1	0	34	0	0	0	0	0	0	0	0	0	0	108	0	0	0	0
5:15 PM	0	56	55	0	0	39	0	0	0	0	1	0	0	0	0	0	151	0	0	0	0
5:30 PM	0	39	53	0	0	43	0	0	0	0	0	0	0	0	0	0	135	0	0	0	0
5:45 PM	0	33	36	0	0	39	0	0	0	0	0	0	0	0	0	0	108	0	0	0	0
Total Survey	0	293	318	2	0	364	0	0	0	0	1	0	0	0	0	0	976	0	0	0	0

Peak Hour Summary
4:35 PM to 5:35 PM

By Approach	Northbound NW Helvetia Rd				Southbound NW Helvetia Rd				Eastbound NW West Union Rd South				Westbound NW West Union Rd South				Total
	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes	
Volume	341	184	525	2	183	167	350	0	1	0	1	0	0	174	174	0	525
%HV	3.2%				1.6%				0.0%				0.0%				2.7%
PHF	0.77				0.70				0.25				0.00				0.87

Pedestrians Crosswalk			
North	South	East	West
0	0	0	0

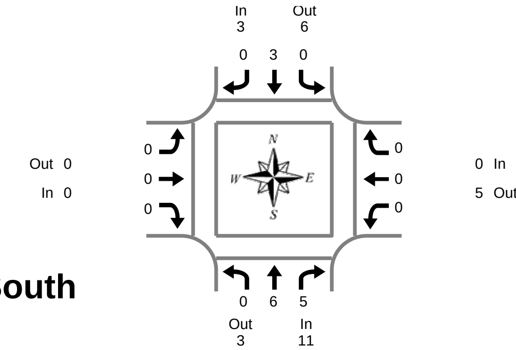
By Movement	Northbound NW Helvetia Rd				Southbound NW Helvetia Rd				Eastbound NW West Union Rd South				Westbound NW West Union Rd South				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	0	167	174	341	0	183	0	183	0	0	1	1	0	0	0	0	525
%HV	0.0%	3.6%	2.9%	3.2%	0.0%	1.6%	0.0%	1.6%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	2.7%
PHF	0.00	0.75	0.73	0.77	0.00	0.70	0.00	0.70	0.00	0.00	0.25	0.25	0.00	0.00	0.00	0.00	0.87

Rolling Hour Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound NW Helvetia Rd				Southbound NW Helvetia Rd				Eastbound NW West Union Rd South				Westbound NW West Union Rd South				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
4:00 PM	0	135	130	1	0	209	0	0	0	0	0	0	0	0	0	0	474	0	0	0	0
4:15 PM	0	143	144	2	0	199	0	0	0	0	0	0	0	0	0	0	486	0	0	0	0
4:30 PM	0	167	175	2	0	178	0	0	0	0	1	0	0	0	0	0	521	0	0	0	0
4:45 PM	0	167	185	1	0	164	0	0	0	0	1	0	0	0	0	0	517	0	0	0	0
5:00 PM	0	158	188	1	0	155	0	0	0	0	1	0	0	0	0	0	502	0	0	0	0

Heavy Vehicle Summary

Clay Carney
(503) 833-2740



Peak Hour Summary
4:35 PM to 5:35 PM

NW Helvetia Rd & NW West Union Rd South

Tuesday, February 13, 2007
4:00 PM to 6:00 PM

Heavy Vehicle 5-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound NW Helvetia Rd				Southbound NW Helvetia Rd				Eastbound NW West Union Rd South				Westbound NW West Union Rd South				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
4:00 PM	0	1	2	3	0	0	0	0	0	0	0	0	0	0	0	0	3
4:05 PM	0	1	1	2	0	1	0	1	0	0	0	0	0	0	0	0	3
4:10 PM	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
4:15 PM	0	0	1	1	0	1	0	1	0	0	0	0	0	0	0	0	2
4:20 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:25 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	1	2	3	0	1	0	1	0	0	0	0	0	0	0	0	4
4:35 PM	0	1	1	2	0	0	0	0	0	0	0	0	0	0	0	0	2
4:40 PM	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:50 PM	0	1	1	2	0	0	0	0	0	0	0	0	0	0	0	0	2
4:55 PM	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1
5:00 PM	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
5:05 PM	0	0	2	2	0	1	0	1	0	0	0	0	0	0	0	0	3
5:10 PM	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
5:15 PM	0	1	0	1	0	1	0	1	0	0	0	0	0	0	0	0	2
5:20 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:25 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
5:35 PM	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1
5:40 PM	0	1	1	2	0	1	0	1	0	0	0	0	0	0	0	0	3
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:50 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:55 PM	0	1	0	1	0	1	0	1	0	0	0	0	0	0	0	0	2
Total Survey	0	12	13	25	0	8	0	8	0	0	0	0	0	0	0	0	33

Heavy Vehicle 15-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound NW Helvetia Rd				Southbound NW Helvetia Rd				Eastbound NW West Union Rd South				Westbound NW West Union Rd South				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
4:00 PM	0	3	3	6	0	1	0	1	0	0	0	0	0	0	0	0	7
4:15 PM	0	0	1	1	0	1	0	1	0	0	0	0	0	0	0	0	2
4:30 PM	0	2	4	6	0	1	0	1	0	0	0	0	0	0	0	0	7
4:45 PM	0	1	1	2	0	1	0	1	0	0	0	0	0	0	0	0	3
5:00 PM	0	2	2	4	0	1	0	1	0	0	0	0	0	0	0	0	5
5:15 PM	0	1	0	1	0	1	0	1	0	0	0	0	0	0	0	0	2
5:30 PM	0	2	2	4	0	1	0	1	0	0	0	0	0	0	0	0	5
5:45 PM	0	1	0	1	0	1	0	1	0	0	0	0	0	0	0	0	2
Total Survey	0	12	13	25	0	8	0	8	0	0	0	0	0	0	0	0	33

Heavy Vehicle Peak Hour Summary
4:35 PM to 5:35 PM

By Approach	Northbound NW Helvetia Rd			Southbound NW Helvetia Rd			Eastbound NW West Union Rd South			Westbound NW West Union Rd South			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	11	3	14	3	6	9	0	0	0	0	5	5	14
PHF	0.69			0.38			0.00			0.00			0.58

By Movement	Northbound NW Helvetia Rd				Southbound NW Helvetia Rd				Eastbound NW West Union Rd South				Westbound NW West Union Rd South				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	0	6	5	11	0	3	0	3	0	0	0	0	0	0	0	0	14
PHF	0.00	0.75	0.63	0.69	0.00	0.38	0.00	0.38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.58

Heavy Vehicle Rolling Hour Summary
4:00 PM to 6:00 PM

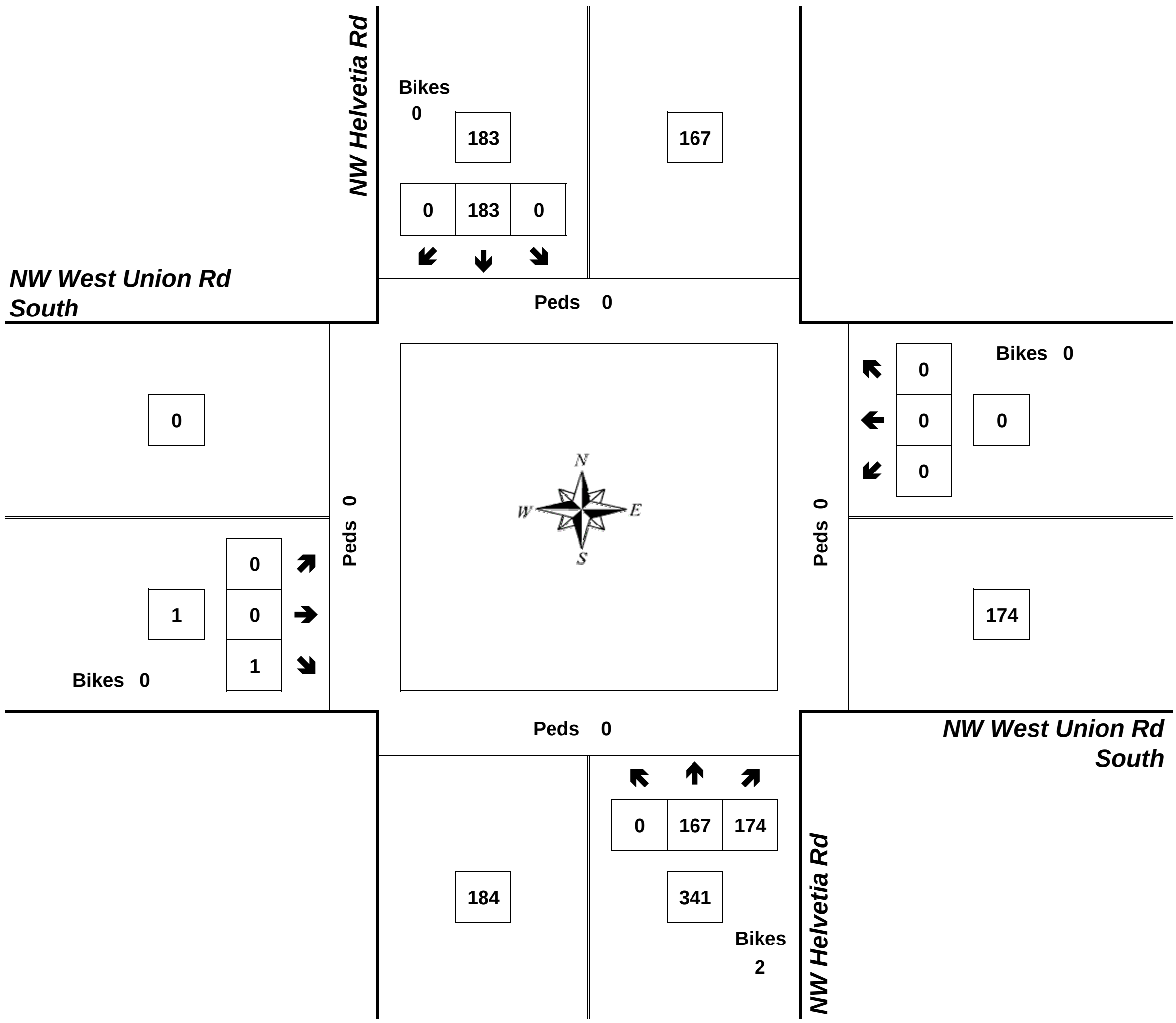
Interval Start Time	Northbound NW Helvetia Rd				Southbound NW Helvetia Rd				Eastbound NW West Union Rd South				Westbound NW West Union Rd South				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
4:00 PM	0	6	9	15	0	4	0	4	0	0	0	0	0	0	0	0	19
4:15 PM	0	5	8	13	0	4	0	4	0	0	0	0	0	0	0	0	17
4:30 PM	0	6	7	13	0	4	0	4	0	0	0	0	0	0	0	0	17
4:45 PM	0	6	5	11	0	4	0	4	0	0	0	0	0	0	0	0	15
5:00 PM	0	6	4	10	0	4	0	4	0	0	0	0	0	0	0	0	14

Peak Hour Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740

NW Helvetia Rd & NW West Union Rd South

4:35 PM to 5:35 PM
Tuesday, February 13, 2007

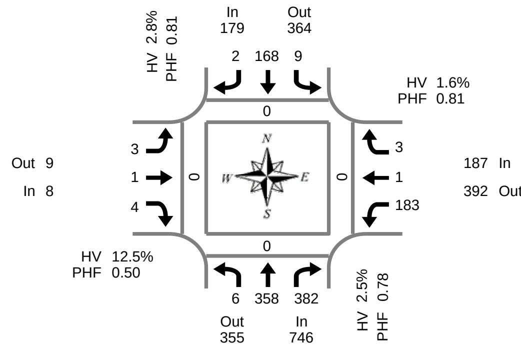


Approach	PHF	HV%	Volume
EB	0.25	0.0%	1
WB	0.00	0.0%	0
NB	0.77	3.2%	341
SB	0.70	1.6%	183
Intersection	0.87	2.7%	525

Count Period: 4:00 PM to 6:00 PM

Total Vehicle Summary

Clay Carney
(503) 833-2740



NW Helvetia Rd & NW Jacobson Rd

Tuesday, February 13, 2007
4:00 PM to 6:00 PM

Peak Hour Summary
4:40 PM to 5:40 PM

5-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start	Northbound NW Helvetia Rd				Southbound NW Helvetia Rd				Eastbound NW Jacobson Rd				Westbound NW Jacobson Rd				Interval	Pedestrians Crosswalk			
Time	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	Total	North	South	East	West
4:00 PM	1	17	17	0	0	14	0	0	0	0	0	0	14	0	0	0	63	0	0	0	0
4:05 PM	0	14	11	0	0	12	1	0	0	0	1	0	9	0	0	0	48	0	0	0	0
4:10 PM	2	20	11	0	1	19	0	0	0	0	0	0	13	0	0	0	66	0	0	0	0
4:15 PM	1	24	14	0	0	17	0	0	0	0	1	0	19	0	1	0	77	0	0	0	0
4:20 PM	0	16	19	0	2	22	0	0	0	0	0	0	11	0	0	0	70	0	0	0	0
4:25 PM	1	19	10	0	0	14	0	0	1	1	0	0	15	0	0	0	61	0	0	0	0
4:30 PM	2	34	14	0	0	23	0	0	0	0	0	0	19	0	0	1	92	0	0	0	0
4:35 PM	1	18	20	1	1	13	0	0	0	0	0	0	14	0	0	0	67	0	0	0	0
4:40 PM	0	29	29	0	2	15	0	0	0	1	0	0	20	0	0	0	96	0	0	0	0
4:45 PM	1	29	23	0	0	18	0	0	0	0	0	0	16	0	0	0	87	0	0	0	0
4:50 PM	0	21	21	0	1	17	2	0	1	0	0	0	16	1	1	0	81	0	0	0	0
4:55 PM	2	25	31	0	0	16	0	0	0	0	0	0	19	0	0	0	93	0	0	0	0
5:00 PM	0	18	19	0	1	11	0	0	0	0	0	0	18	0	0	0	67	0	0	0	0
5:05 PM	0	27	25	0	1	10	0	0	0	0	1	0	21	0	0	1	85	0	0	0	0
5:10 PM	1	32	34	0	1	11	0	0	0	0	1	0	16	0	1	0	97	0	0	0	0
5:15 PM	0	34	40	0	0	10	0	0	0	0	0	0	17	0	0	0	101	0	0	0	0
5:20 PM	1	30	54	0	0	15	0	1	0	0	1	0	10	0	0	0	111	0	0	0	0
5:25 PM	1	45	32	0	1	12	0	0	1	0	0	1	7	0	0	0	99	0	0	0	0
5:30 PM	0	30	47	0	1	15	0	0	1	0	1	0	8	0	0	0	103	0	0	0	0
5:35 PM	0	38	27	0	1	18	0	0	0	0	0	0	15	0	1	0	100	0	0	0	0
5:40 PM	0	24	29	0	0	8	0	0	0	0	0	0	15	0	0	0	76	0	0	0	0
5:45 PM	0	23	10	0	0	11	0	0	0	0	1	0	6	0	0	0	51	0	0	0	0
5:50 PM	1	23	21	0	1	12	0	0	0	0	0	0	15	0	0	0	73	0	0	0	0
5:55 PM	0	19	22	0	0	13	0	0	0	0	0	0	14	0	0	0	68	0	0	0	0
Total Survey	15	609	580	1	14	346	3	1	4	2	7	1	347	1	4	2	1,932	0	0	0	0

15-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start	Northbound NW Helvetia Rd				Southbound NW Helvetia Rd				Eastbound NW Jacobson Rd				Westbound NW Jacobson Rd				Interval	Pedestrians Crosswalk			
Time	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	Total	North	South	East	West
4:00 PM	3	51	39	0	1	45	1	0	0	0	1	0	36	0	0	0	177	0	0	0	0
4:15 PM	2	59	43	0	2	53	0	0	1	1	1	0	45	0	1	0	208	0	0	0	0
4:30 PM	3	81	63	1	3	51	0	0	0	1	0	0	53	0	0	1	255	0	0	0	0
4:45 PM	3	75	75	0	1	51	2	0	1	0	0	0	51	1	1	0	261	0	0	0	0
5:00 PM	1	77	78	0	3	32	0	0	0	0	2	0	55	0	1	1	249	0	0	0	0
5:15 PM	2	109	126	0	1	37	0	1	1	0	1	1	34	0	0	0	311	0	0	0	0
5:30 PM	0	92	103	0	2	41	0	0	1	0	1	0	38	0	1	0	279	0	0	0	0
5:45 PM	1	65	53	0	1	36	0	0	0	0	1	0	35	0	0	0	192	0	0	0	0
Total Survey	15	609	580	1	14	346	3	1	4	2	7	1	347	1	4	2	1,932	0	0	0	0

Peak Hour Summary
4:40 PM to 5:40 PM

By Approach	Northbound NW Helvetia Rd				Southbound NW Helvetia Rd				Eastbound NW Jacobson Rd				Westbound NW Jacobson Rd				Total	Pedestrians Crosswalk			
	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes		North	South	East	West
Volume	746	355	1,101	0	179	364	543	1	8	9	17	1	187	392	579	1	1,120	0	0	0	0
%HV	2.5%				2.8%				12.5%				1.6%				2.5%				
PHF	0.78				0.81				0.50				0.81				0.89				

By Movement	Northbound NW Helvetia Rd				Southbound NW Helvetia Rd				Eastbound NW Jacobson Rd				Westbound NW Jacobson Rd				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	6	358	382	746	9	168	2	179	3	1	4	8	183	1	3	187	1,120
%HV	0.0%	3.1%	2.1%	2.5%	22.2%	1.2%	50.0%	2.8%	33.3%	0.0%	0.0%	12.5%	1.6%	0.0%	0.0%	1.6%	2.5%
PHF	0.50	0.79	0.72	0.78	0.75	0.82	0.25	0.81	0.38	0.25	0.50	0.50	0.79	0.25	0.75	0.81	0.89

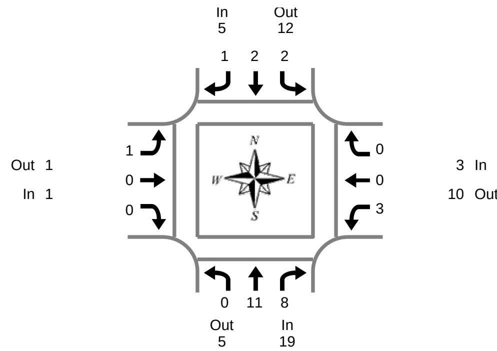
Rolling Hour Summary
4:00 PM to 6:00 PM

Interval Start	Northbound NW Helvetia Rd				Southbound NW Helvetia Rd				Eastbound NW Jacobson Rd				Westbound NW Jacobson Rd				Interval	Pedestrians Crosswalk			
Time	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	Total	North	South	East	West
4:00 PM	11	266	220	1	7	200	3	0	2	2	2	0	185	1	2	1	901	0	0	0	0
4:15 PM	9	292	259	1	9	187	2	0	2	2	3	0	204	1	3	2	973	0	0	0	0
4:30 PM	9	342	342	1	8	171	2	1	2	1	3	1	193	1	2	2	1,076	0	0	0	0
4:45 PM	6	353	382	0	7	161	2	1	3	0	4	1	178	1	3	1	1,100	0	0	0	0
5:00 PM	4	343	360	0	7	146	0	1	2	0	5	1	162	0	2	1	1,031	0	0	0	0

Heavy Vehicle Summary

All Traffic Data Services Inc.

Clay Carney
(503) 833-2740



Peak Hour Summary
4:40 PM to 5:40 PM

NW Helvetia Rd & NW Jacobson Rd

Tuesday, February 13, 2007
4:00 PM to 6:00 PM

Heavy Vehicle 5-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound NW Helvetia Rd				Southbound NW Helvetia Rd				Eastbound NW Jacobson Rd				Westbound NW Jacobson Rd				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
4:00 PM	0	2	1	3	0	0	0	0	0	0	0	0	0	0	0	0	3
4:05 PM	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
4:10 PM	0	1	2	3	0	1	0	1	0	0	0	0	0	0	0	0	4
4:15 PM	0	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	3
4:20 PM	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1
4:25 PM	0	0	1	1	0	0	0	0	0	1	0	1	0	0	0	0	2
4:30 PM	0	2	2	4	0	1	0	1	0	0	0	0	1	0	0	1	6
4:35 PM	0	3	0	3	0	0	0	0	0	0	0	0	1	0	0	1	4
4:40 PM	0	1	1	2	1	0	0	1	0	0	0	0	0	0	0	0	3
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:50 PM	0	0	0	0	0	0	1	1	1	0	0	1	0	0	0	0	2
4:55 PM	0	1	1	2	0	0	0	0	0	0	0	0	0	0	0	0	2
5:00 PM	0	1	1	2	0	0	0	0	0	0	0	0	1	0	0	1	3
5:05 PM	0	2	1	3	0	1	0	1	0	0	0	0	0	0	0	0	4
5:10 PM	0	1	2	3	0	0	0	0	0	0	0	0	0	0	0	0	3
5:15 PM	0	1	1	2	0	0	0	0	0	0	0	0	1	0	0	1	3
5:20 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:25 PM	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1
5:30 PM	0	3	0	3	1	0	0	1	0	0	0	0	0	0	0	0	4
5:35 PM	0	1	1	2	0	0	0	0	0	0	0	0	1	0	0	1	3
5:40 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	1	0	1	0	1	0	1	0	0	0	0	0	0	0	0	2
5:50 PM	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1
5:55 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Survey	0	25	15	40	2	6	1	9	1	1	0	2	5	0	0	5	56

Heavy Vehicle 15-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound NW Helvetia Rd				Southbound NW Helvetia Rd				Eastbound NW Jacobson Rd				Westbound NW Jacobson Rd				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
4:00 PM	0	5	3	8	0	1	0	1	0	0	0	0	0	0	0	0	9
4:15 PM	0	3	1	4	0	1	0	1	0	1	0	1	0	0	0	0	6
4:30 PM	0	6	3	9	1	1	0	2	0	0	0	0	2	0	0	2	13
4:45 PM	0	1	1	2	0	0	1	1	1	0	0	1	0	0	0	0	4
5:00 PM	0	4	4	8	0	1	0	1	0	0	0	0	1	0	0	1	10
5:15 PM	0	1	1	2	0	1	0	1	0	0	0	0	1	0	0	1	4
5:30 PM	0	4	1	5	1	0	0	1	0	0	0	0	1	0	0	1	7
5:45 PM	0	1	1	2	0	1	0	1	0	0	0	0	0	0	0	0	3
Total Survey	0	25	15	40	2	6	1	9	1	1	0	2	5	0	0	5	56

Heavy Vehicle Peak Hour Summary
4:40 PM to 5:40 PM

By Approach	Northbound NW Helvetia Rd			Southbound NW Helvetia Rd			Eastbound NW Jacobson Rd			Westbound NW Jacobson Rd			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	19	5	24	5	12	17	1	1	2	3	10	13	28
PHF	0.59			0.63			0.25			0.75			0.70

By Movement	Northbound NW Helvetia Rd				Southbound NW Helvetia Rd				Eastbound NW Jacobson Rd				Westbound NW Jacobson Rd				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	0	11	8	19	2	2	1	5	1	0	0	1	3	0	0	3	28
PHF	0.00	0.69	0.50	0.59	0.50	0.50	0.25	0.63	0.25	0.00	0.00	0.25	0.75	0.00	0.00	0.75	0.70

Heavy Vehicle Rolling Hour Summary
4:00 PM to 6:00 PM

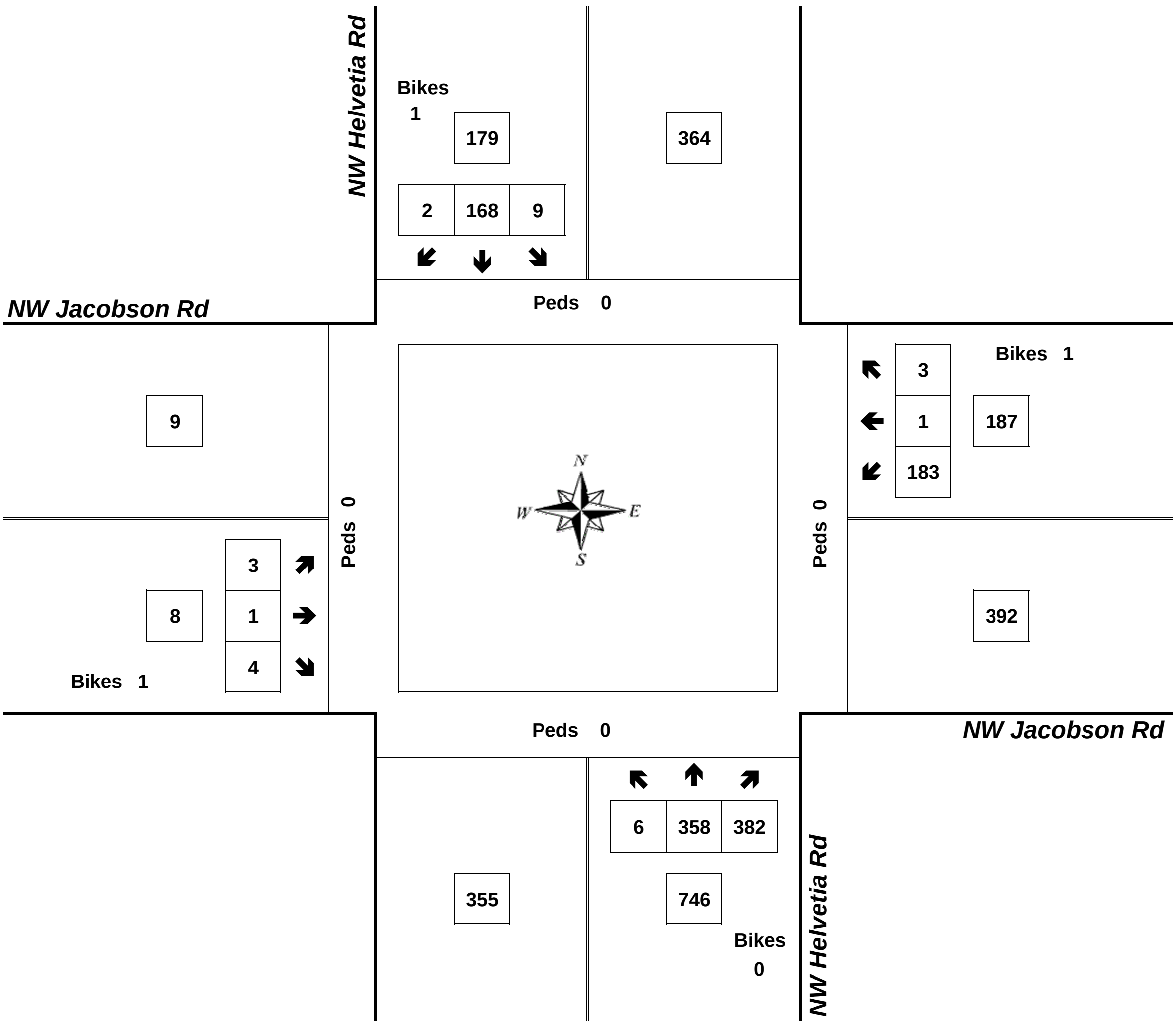
Interval Start Time	Northbound NW Helvetia Rd				Southbound NW Helvetia Rd				Eastbound NW Jacobson Rd				Westbound NW Jacobson Rd				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
4:00 PM	0	15	8	23	1	3	1	5	1	1	0	2	2	0	0	2	32
4:15 PM	0	14	9	23	1	3	1	5	1	1	0	2	3	0	0	3	33
4:30 PM	0	12	9	21	1	3	1	5	1	0	0	1	4	0	0	4	31
4:45 PM	0	10	7	17	1	2	1	4	1	0	0	1	3	0	0	3	25
5:00 PM	0	10	7	17	1	3	0	4	0	0	0	0	3	0	0	3	24

Peak Hour Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740

NW Helvetia Rd & NW Jacobson Rd

4:40 PM to 5:40 PM
Tuesday, February 13, 2007



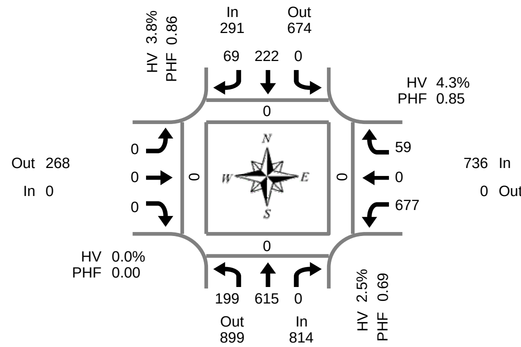
Approach	PHF	HV%	Volume
EB	0.50	12.5%	8
WB	0.81	1.6%	187
NB	0.78	2.5%	746
SB	0.81	2.8%	179
Intersection	0.89	2.5%	1,120

Count Period: 4:00 PM to 6:00 PM

Total Vehicle Summary

All Traffic Data Services Inc.

Clay Carney
(503) 833-2740



Peak Hour Summary
4:40 PM to 5:40 PM

NW Shute Rd & Hwy 26 WB Ramps

Thursday, March 15, 2007
4:00 PM to 6:00 PM

5-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound NW Shute Rd				Southbound NW Shute Rd				Eastbound Hwy 26 WB Ramps				Westbound Hwy 26 WB Ramps				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
4:00 PM	15	23	0	0	0	32	6	0	0	0	0	0	52	0	3	0	131	0	0	0	0
4:05 PM	18	22	0	0	0	27	5	0	0	0	0	0	56	0	6	0	134	0	0	0	0
4:10 PM	14	37	0	0	0	26	3	0	0	0	0	0	56	0	4	0	140	0	0	0	0
4:15 PM	21	41	0	0	0	21	3	0	0	0	0	0	65	0	3	0	154	0	0	0	0
4:20 PM	11	29	0	0	0	29	3	0	0	0	0	0	55	0	8	0	135	0	0	0	0
4:25 PM	17	37	0	0	0	20	2	0	0	0	0	0	43	0	3	0	122	0	0	0	0
4:30 PM	13	34	0	0	0	19	8	0	0	0	0	0	71	0	5	0	150	0	0	0	0
4:35 PM	14	18	0	0	0	26	6	0	0	0	0	0	73	0	3	0	140	0	0	0	0
4:40 PM	14	40	0	0	0	21	6	2	0	0	0	0	64	0	8	0	153	0	0	0	0
4:45 PM	9	41	0	0	0	23	5	0	0	0	0	0	58	0	7	0	143	0	0	0	0
4:50 PM	10	26	0	0	0	22	8	0	0	0	0	0	76	0	4	0	146	0	0	0	0
4:55 PM	12	34	0	0	0	11	10	0	0	0	0	0	55	0	8	0	130	0	0	0	0
5:00 PM	16	28	0	0	0	16	6	0	0	0	0	0	63	0	3	0	132	0	0	0	0
5:05 PM	20	46	0	1	0	17	6	0	0	0	0	0	71	0	3	0	163	0	0	0	0
5:10 PM	27	67	0	0	0	17	5	0	0	0	0	0	52	0	4	0	172	0	0	0	0
5:15 PM	25	81	0	0	0	15	2	0	0	0	0	0	56	0	4	0	183	0	0	0	0
5:20 PM	27	66	0	0	0	22	7	0	0	0	0	0	39	0	3	0	164	0	0	0	0
5:25 PM	11	64	0	0	0	18	3	0	0	0	0	0	50	0	7	0	153	0	0	0	0
5:30 PM	14	66	0	0	0	23	4	0	0	0	0	0	45	0	3	0	155	0	0	0	0
5:35 PM	14	56	0	0	0	17	7	0	0	0	0	0	48	0	5	0	147	0	0	0	0
5:40 PM	14	41	0	0	0	20	6	0	0	0	0	0	58	0	5	0	144	0	0	0	0
5:45 PM	25	31	0	0	0	13	2	0	0	0	0	0	48	0	8	0	127	0	0	0	0
5:50 PM	17	47	0	0	0	22	1	0	0	0	0	0	59	0	3	0	149	0	0	0	0
5:55 PM	13	38	0	0	0	23	3	0	0	0	0	0	44	0	2	0	123	0	0	0	0
Total Survey	391	1,013	0	1	0	500	117	2	0	0	0	0	1,357	0	112	0	3,490	0	0	0	0

15-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound NW Shute Rd				Southbound NW Shute Rd				Eastbound Hwy 26 WB Ramps				Westbound Hwy 26 WB Ramps				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
4:00 PM	47	82	0	0	0	85	14	0	0	0	0	0	164	0	13	0	405	0	0	0	0
4:15 PM	49	107	0	0	0	70	8	0	0	0	0	0	163	0	14	0	411	0	0	0	0
4:30 PM	41	92	0	0	0	66	20	2	0	0	0	0	208	0	16	0	443	0	0	0	0
4:45 PM	31	101	0	0	0	56	23	0	0	0	0	0	189	0	19	0	419	0	0	0	0
5:00 PM	63	141	0	1	0	50	17	0	0	0	0	0	186	0	10	0	467	0	0	0	0
5:15 PM	63	211	0	0	0	55	12	0	0	0	0	0	145	0	14	0	500	0	0	0	0
5:30 PM	42	163	0	0	0	60	17	0	0	0	0	0	151	0	13	0	446	0	0	0	0
5:45 PM	55	116	0	0	0	58	6	0	0	0	0	0	151	0	13	0	399	0	0	0	0
Total Survey	391	1,013	0	1	0	500	117	2	0	0	0	0	1,357	0	112	0	3,490	0	0	0	0

Peak Hour Summary
4:40 PM to 5:40 PM

By Approach	Northbound NW Shute Rd				Southbound NW Shute Rd				Eastbound Hwy 26 WB Ramps				Westbound Hwy 26 WB Ramps				Total
	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes	
Volume	814	899	1,713	1	291	674	965	2	0	268	268	0	736	0	736	0	1,841
%HV	2.5%				3.8%				0.0%				4.3%				3.4%
PHF	0.69				0.86				0.00				0.85				0.89

Pedestrians Crosswalk			
North	South	East	West
0	0	0	0

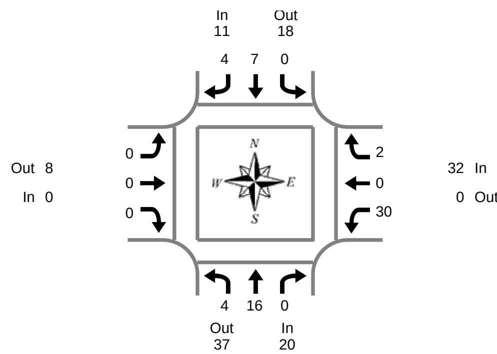
By Movement	Northbound NW Shute Rd				Southbound NW Shute Rd				Eastbound Hwy 26 WB Ramps				Westbound Hwy 26 WB Ramps				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	199	615	0	814	0	222	69	291	0	0	0	0	677	0	59	736	1,841
%HV	2.0%	2.6%	0.0%	2.5%	0.0%	3.2%	5.8%	3.8%	0.0%	0.0%	0.0%	0.0%	4.4%	0.0%	3.4%	4.3%	3.4%
PHF	0.63	0.72	0.00	0.69	0.00	0.84	0.72	0.86	0.00	0.00	0.00	0.00	0.85	0.00	0.78	0.85	0.89

Rolling Hour Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound NW Shute Rd				Southbound NW Shute Rd				Eastbound Hwy 26 WB Ramps				Westbound Hwy 26 WB Ramps				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
4:00 PM	168	382	0	0	0	277	65	2	0	0	0	0	724	0	62	0	1,678	0	0	0	0
4:15 PM	184	441	0	1	0	242	68	2	0	0	0	0	746	0	59	0	1,740	0	0	0	0
4:30 PM	198	545	0	1	0	227	72	2	0	0	0	0	728	0	59	0	1,829	0	0	0	0
4:45 PM	199	616	0	1	0	221	69	0	0	0	0	0	671	0	56	0	1,832	0	0	0	0
5:00 PM	223	631	0	1	0	223	52	0	0	0	0	0	633	0	50	0	1,812	0	0	0	0

Heavy Vehicle Summary

Clay Carney
(503) 833-2740



Peak Hour Summary
4:40 PM to 5:40 PM

NW Shute Rd & Hwy 26 WB Ramps

Thursday, March 15, 2007
4:00 PM to 6:00 PM

Heavy Vehicle 5-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound NW Shute Rd				Southbound NW Shute Rd				Eastbound Hwy 26 WB Ramps				Westbound Hwy 26 WB Ramps				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
4:00 PM	1	1	0	2	0	4	0	4	0	0	0	0	2	0	0	2	8
4:05 PM	0	2	0	2	0	0	0	0	0	0	0	0	1	0	0	1	3
4:10 PM	0	1	0	1	0	2	0	2	0	0	0	0	2	0	0	2	5
4:15 PM	0	1	0	1	0	1	1	2	0	0	0	0	4	0	0	4	7
4:20 PM	1	3	0	4	0	1	0	1	0	0	0	0	3	0	1	4	9
4:25 PM	1	2	0	3	0	2	0	2	0	0	0	0	0	0	0	0	5
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	5	0	1	6	6
4:35 PM	0	2	0	2	0	1	0	1	0	0	0	0	2	0	0	2	5
4:40 PM	0	6	0	6	0	1	0	1	0	0	0	0	3	0	0	3	10
4:45 PM	1	1	0	2	0	1	0	1	0	0	0	0	4	0	0	4	7
4:50 PM	0	2	0	2	0	1	0	1	0	0	0	0	3	0	1	4	7
4:55 PM	1	3	0	4	0	0	3	3	0	0	0	0	1	0	1	2	9
5:00 PM	1	0	0	1	0	1	0	1	0	0	0	0	3	0	0	3	5
5:05 PM	0	1	0	1	0	1	0	1	0	0	0	0	3	0	0	3	5
5:10 PM	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0	5	5
5:15 PM	0	0	0	0	0	1	1	2	0	0	0	0	2	0	0	2	4
5:20 PM	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
5:25 PM	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	3	3
5:30 PM	1	0	0	1	0	1	0	1	0	0	0	0	1	0	0	1	3
5:35 PM	0	1	0	1	0	0	0	0	0	0	0	0	2	0	0	2	3
5:40 PM	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	3	3
5:45 PM	1	1	0	2	0	0	0	0	0	0	0	0	2	0	1	3	5
5:50 PM	1	0	0	1	0	0	0	0	0	0	0	0	1	0	0	1	2
5:55 PM	1	1	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
Total Survey	10	30	0	40	0	18	5	23	0	0	0	0	55	0	5	60	123

Heavy Vehicle 15-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound NW Shute Rd				Southbound NW Shute Rd				Eastbound Hwy 26 WB Ramps				Westbound Hwy 26 WB Ramps				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
4:00 PM	1	4	0	5	0	6	0	6	0	0	0	0	5	0	0	5	16
4:15 PM	2	6	0	8	0	4	1	5	0	0	0	0	7	0	1	8	21
4:30 PM	0	8	0	8	0	2	0	2	0	0	0	0	10	0	1	11	21
4:45 PM	2	6	0	8	0	2	3	5	0	0	0	0	8	0	2	10	23
5:00 PM	1	1	0	2	0	2	0	2	0	0	0	0	11	0	0	11	15
5:15 PM	0	2	0	2	0	1	1	2	0	0	0	0	5	0	0	5	9
5:30 PM	1	1	0	2	0	1	0	1	0	0	0	0	6	0	0	6	9
5:45 PM	3	2	0	5	0	0	0	0	0	0	0	0	3	0	1	4	9
Total Survey	10	30	0	40	0	18	5	23	0	0	0	0	55	0	5	60	123

Heavy Vehicle Peak Hour Summary
4:40 PM to 5:40 PM

By Approach	Northbound NW Shute Rd			Southbound NW Shute Rd			Eastbound Hwy 26 WB Ramps			Westbound Hwy 26 WB Ramps			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	20	37	57	11	18	29	0	8	8	32	0	32	63
PHF	0.50			0.55			0.00			0.73			0.66

By Movement	Northbound NW Shute Rd				Southbound NW Shute Rd				Eastbound Hwy 26 WB Ramps				Westbound Hwy 26 WB Ramps				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	4	16	0	20	0	7	4	11	0	0	0	0	30	0	2	32	63
PHF	0.50	0.44	0.00	0.50	0.00	0.58	0.33	0.55	0.00	0.00	0.00	0.00	0.68	0.00	0.25	0.73	0.66

Heavy Vehicle Rolling Hour Summary
4:00 PM to 6:00 PM

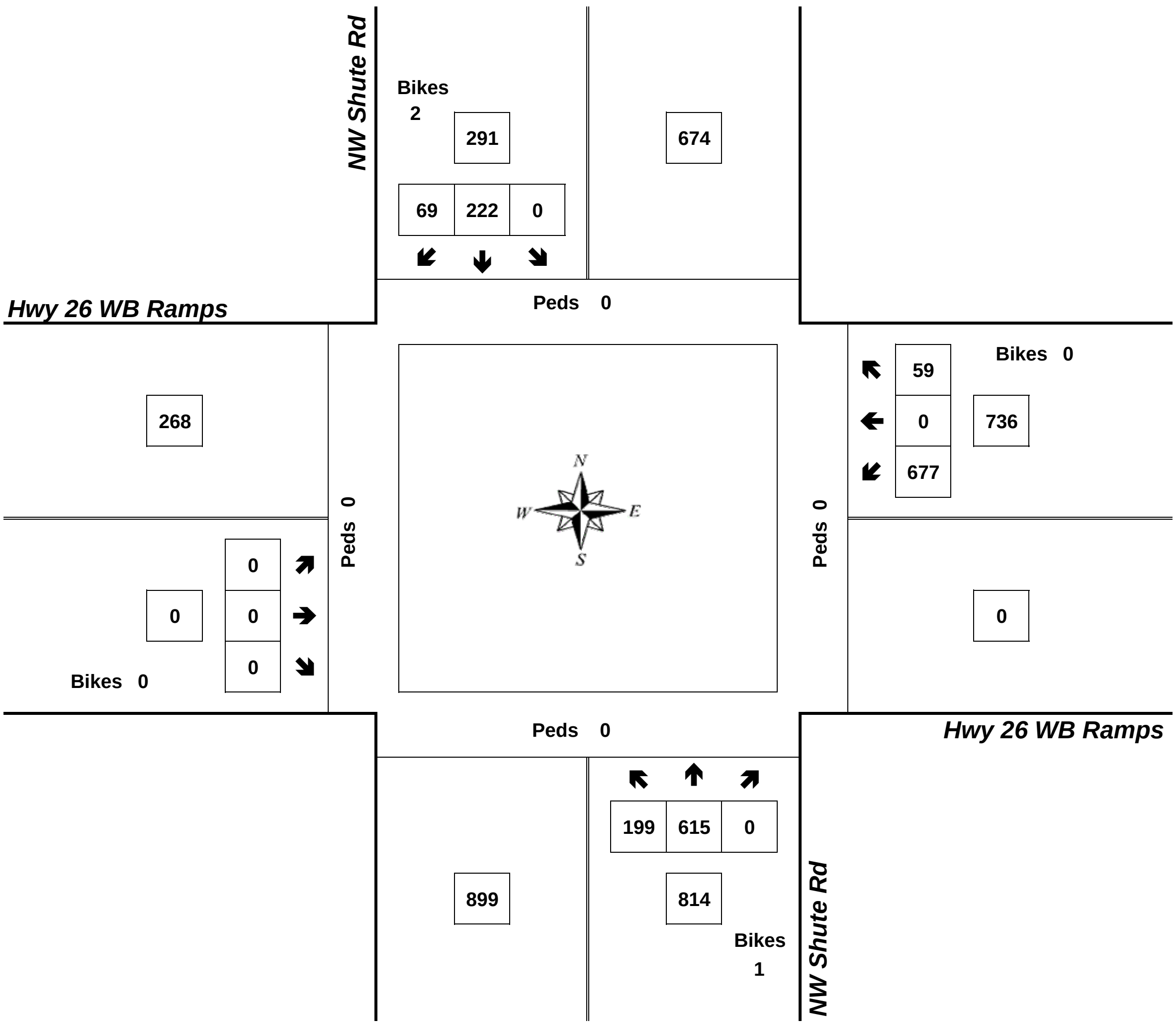
Interval Start Time	Northbound NW Shute Rd				Southbound NW Shute Rd				Eastbound Hwy 26 WB Ramps				Westbound Hwy 26 WB Ramps				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
4:00 PM	5	24	0	29	0	14	4	18	0	0	0	0	30	0	4	34	81
4:15 PM	5	21	0	26	0	10	4	14	0	0	0	0	36	0	4	40	80
4:30 PM	3	17	0	20	0	7	4	11	0	0	0	0	34	0	3	37	68
4:45 PM	4	10	0	14	0	6	4	10	0	0	0	0	30	0	2	32	56
5:00 PM	5	6	0	11	0	4	1	5	0	0	0	0	25	0	1	26	42

Peak Hour Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740

NW Shute Rd & Hwy 26 WB Ramps

4:40 PM to 5:40 PM
Thursday, March 15, 2007

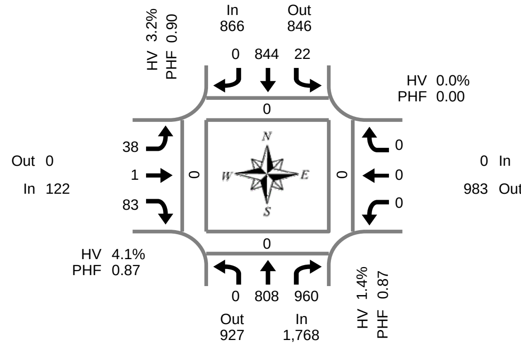


Approach	PHF	HV%	Volume
EB	0.00	0.0%	0
WB	0.85	4.3%	736
NB	0.69	2.5%	814
SB	0.86	3.8%	291
Intersection	0.89	3.4%	1,841

Count Period: 4:00 PM to 6:00 PM

Total Vehicle Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740



Peak Hour Summary
5:00 PM to 6:00 PM

NW Shute Rd & Hwy 26 EB Ramps

Thursday, March 15, 2007
4:00 PM to 6:00 PM

5-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound NW Shute Rd L	T	R	Bikes	Southbound NW Shute Rd L	T	R	Bikes	Eastbound Hwy 26 EB Ramps L	T	R	Bikes	Westbound Hwy 26 EB Ramps L	T	R	Bikes	Interval Total	Pedestrians Crosswalk North	South	East	West
4:00 PM	0	34	57	0	4	74	0	0	3	0	8	0	0	0	0	0	180	0	0	1	0
4:05 PM	0	36	67	0	4	80	0	0	2	0	4	0	0	0	0	0	193	0	0	0	0
4:10 PM	0	47	49	0	1	84	0	0	1	0	6	0	0	0	0	0	188	0	0	0	0
4:15 PM	0	52	67	0	2	78	0	0	2	0	5	0	0	0	0	0	206	0	0	0	0
4:20 PM	0	43	55	0	8	64	0	0	4	0	5	0	0	0	0	0	179	0	0	0	0
4:25 PM	0	48	75	0	2	62	0	0	1	0	9	0	0	0	0	0	197	0	0	0	0
4:30 PM	0	44	65	0	2	84	0	0	2	0	6	0	0	0	0	0	203	0	0	0	0
4:35 PM	0	42	59	0	2	94	0	0	1	0	9	0	0	0	0	0	207	0	0	0	0
4:40 PM	0	41	61	0	3	81	0	2	6	0	10	0	0	0	0	0	202	0	0	0	1
4:45 PM	0	52	62	0	4	79	0	0	1	0	9	0	0	0	0	0	207	0	0	0	0
4:50 PM	0	32	49	0	7	87	0	0	3	0	5	0	0	0	0	0	183	0	0	0	0
4:55 PM	0	46	63	0	2	68	0	0	3	0	5	0	0	0	0	0	187	0	0	0	1
5:00 PM	0	61	58	0	3	75	0	0	2	0	10	0	0	0	0	0	209	0	0	0	0
5:05 PM	0	74	80	1	0	81	0	0	2	0	8	0	0	0	0	0	245	0	0	0	0
5:10 PM	0	74	84	0	1	81	0	0	1	0	8	0	0	0	0	0	249	0	0	0	0
5:15 PM	0	87	75	0	2	67	0	0	4	0	9	0	0	0	0	0	244	0	0	0	0
5:20 PM	0	84	84	0	2	59	0	0	7	1	4	0	0	0	0	0	241	0	0	0	0
5:25 PM	0	88	89	0	2	60	0	0	4	0	6	0	0	0	0	0	249	0	0	0	0
5:30 PM	0	65	91	0	0	70	0	0	2	0	11	0	0	0	0	0	239	0	0	0	0
5:35 PM	0	61	85	0	1	72	0	0	4	0	6	0	0	0	0	0	229	0	0	0	0
5:40 PM	0	63	94	0	3	65	0	0	2	0	2	0	0	0	0	0	229	0	0	0	0
5:45 PM	0	48	69	0	5	65	0	0	4	0	3	0	0	0	0	0	194	0	0	0	0
5:50 PM	0	51	76	0	1	77	0	0	4	0	5	0	0	0	0	0	214	0	0	0	0
5:55 PM	0	52	75	0	2	72	0	0	2	0	11	0	0	0	0	0	214	0	0	0	0
Total Survey	0	1,325	1,689	1	63	1,779	0	2	67	1	164	0	0	0	0	0	5,088	0	0	1	2

15-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound NW Shute Rd L	T	R	Bikes	Southbound NW Shute Rd L	T	R	Bikes	Eastbound Hwy 26 EB Ramps L	T	R	Bikes	Westbound Hwy 26 EB Ramps L	T	R	Bikes	Interval Total	Pedestrians Crosswalk North	South	East	West
4:00 PM	0	117	173	0	9	238	0	0	6	0	18	0	0	0	0	0	561	0	0	1	0
4:15 PM	0	143	197	0	12	204	0	0	7	0	19	0	0	0	0	0	582	0	0	0	0
4:30 PM	0	127	185	0	7	259	0	2	9	0	25	0	0	0	0	0	612	0	0	0	1
4:45 PM	0	130	174	0	13	234	0	0	7	0	19	0	0	0	0	0	577	0	0	0	1
5:00 PM	0	209	222	1	4	237	0	0	5	0	26	0	0	0	0	0	703	0	0	0	0
5:15 PM	0	259	248	0	6	186	0	0	15	1	19	0	0	0	0	0	734	0	0	0	0
5:30 PM	0	189	270	0	4	207	0	0	8	0	19	0	0	0	0	0	697	0	0	0	0
5:45 PM	0	151	220	0	8	214	0	0	10	0	19	0	0	0	0	0	622	0	0	0	0
Total Survey	0	1,325	1,689	1	63	1,779	0	2	67	1	164	0	0	0	0	0	5,088	0	0	1	2

Peak Hour Summary
5:00 PM to 6:00 PM

By Approach	Northbound NW Shute Rd In	Out	Total	Bikes	Southbound NW Shute Rd In	Out	Total	Bikes	Eastbound Hwy 26 EB Ramps In	Out	Total	Bikes	Westbound Hwy 26 EB Ramps In	Out	Total	Bikes	Total	Pedestrians Crosswalk North	South	East	West
Volume	1,768	927	2,695	1	866	846	1,712	0	122	0	122	0	0	983	983	0	2,756	0	0	0	0
%HV	1.4%				3.2%				4.1%				0.0%				2.1%				
PHF	0.87				0.90				0.87				0.00				0.93				

By Movement	Northbound NW Shute Rd L	T	R	Total	Southbound NW Shute Rd L	T	R	Total	Eastbound Hwy 26 EB Ramps L	T	R	Total	Westbound Hwy 26 EB Ramps L	T	R	Total	Total
Volume	0	808	960	1,768	22	844	0	866	38	1	83	122	0	0	0	0	2,756
%HV	0.0%	1.4%	1.4%	1.4%	0.0%	3.3%	0.0%	3.2%	0.0%	0.0%	6.0%	4.1%	0.0%	0.0%	0.0%	0.0%	2.1%
PHF	0.00	0.78	0.89	0.87	0.61	0.89	0.00	0.90	0.63	0.25	0.80	0.87	0.00	0.00	0.00	0.00	0.93

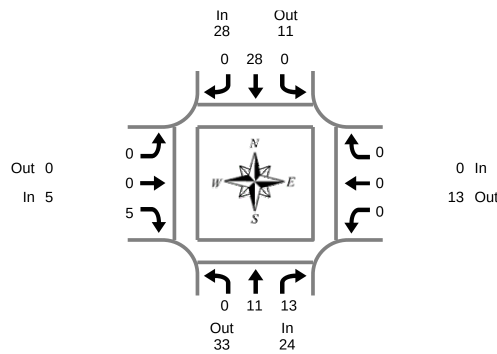
Rolling Hour Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound NW Shute Rd L	T	R	Bikes	Southbound NW Shute Rd L	T	R	Bikes	Eastbound Hwy 26 EB Ramps L	T	R	Bikes	Westbound Hwy 26 EB Ramps L	T	R	Bikes	Interval Total	Pedestrians Crosswalk North	South	East	West
4:00 PM	0	517	729	0	41	935	0	2	29	0	81	0	0	0	0	0	2,332	0	0	1	2
4:15 PM	0	609	778	1	36	934	0	2	28	0	89	0	0	0	0	0	2,474	0	0	0	2
4:30 PM	0	725	829	1	30	916	0	2	36	1	89	0	0	0	0	0	2,626	0	0	0	2
4:45 PM	0	787	914	1	27	864	0	0	35	1	83	0	0	0	0	0	2,711	0	0	0	1
5:00 PM	0	808	960	1	22	844	0	0	38	1	83	0	0	0	0	0	2,756	0	0	0	0

Heavy Vehicle Summary

All Traffic Data Services Inc.

Clay Carney
(503) 833-2740



Peak Hour Summary
5:00 PM to 6:00 PM

NW Shute Rd & Hwy 26 EB Ramps

Thursday, March 15, 2007
4:00 PM to 6:00 PM

Heavy Vehicle 5-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound NW Shute Rd				Southbound NW Shute Rd				Eastbound Hwy 26 EB Ramps				Westbound Hwy 26 EB Ramps				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
4:00 PM	0	3	3	6	0	6	0	6	0	0	2	2	0	0	0	0	14
4:05 PM	0	2	2	4	0	3	0	3	0	0	0	0	0	0	0	0	7
4:10 PM	0	0	1	1	0	4	0	4	0	0	0	0	0	0	0	0	5
4:15 PM	0	3	5	8	1	3	0	4	0	0	0	0	0	0	0	0	12
4:20 PM	0	3	1	4	0	3	0	3	1	0	2	3	0	0	0	0	10
4:25 PM	0	2	1	3	0	1	0	1	0	0	0	0	0	0	0	0	4
4:30 PM	0	1	2	3	0	5	0	5	0	0	1	1	0	0	0	0	9
4:35 PM	0	2	1	3	1	2	0	3	1	0	0	1	0	0	0	0	7
4:40 PM	0	4	4	8	0	4	0	4	0	0	0	0	0	0	0	0	12
4:45 PM	0	1	2	3	2	5	0	7	1	0	0	1	0	0	0	0	11
4:50 PM	0	0	3	3	0	3	0	3	1	0	3	4	0	0	0	0	10
4:55 PM	0	4	3	7	0	1	0	1	0	0	0	0	0	0	0	0	8
5:00 PM	0	1	0	1	0	3	0	3	0	0	0	0	0	0	0	0	4
5:05 PM	0	1	0	1	0	4	0	4	0	0	0	0	0	0	0	0	5
5:10 PM	0	0	0	0	0	5	0	5	0	0	0	0	0	0	0	0	5
5:15 PM	0	0	0	0	0	3	0	3	0	0	2	2	0	0	0	0	5
5:20 PM	0	1	0	1	0	1	0	1	0	0	1	1	0	0	0	0	3
5:25 PM	0	0	0	0	0	2	0	2	0	0	1	1	0	0	0	0	3
5:30 PM	0	0	2	2	0	3	0	3	0	0	0	0	0	0	0	0	5
5:35 PM	0	1	3	4	0	2	0	2	0	0	0	0	0	0	0	0	6
5:40 PM	0	2	1	3	0	3	0	3	0	0	0	0	0	0	0	0	6
5:45 PM	0	2	2	4	0	2	0	2	0	0	0	0	0	0	0	0	6
5:50 PM	0	1	3	4	0	0	0	0	0	0	0	0	0	0	0	0	4
5:55 PM	0	2	2	4	0	0	0	0	0	0	1	1	0	0	0	0	5
Total Survey	0	36	41	77	4	68	0	72	4	0	13	17	0	0	0	0	166

Heavy Vehicle 15-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound NW Shute Rd				Southbound NW Shute Rd				Eastbound Hwy 26 EB Ramps				Westbound Hwy 26 EB Ramps				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
4:00 PM	0	5	6	11	0	13	0	13	0	0	2	2	0	0	0	0	26
4:15 PM	0	8	7	15	1	7	0	8	1	0	2	3	0	0	0	0	26
4:30 PM	0	7	7	14	1	11	0	12	1	0	1	2	0	0	0	0	28
4:45 PM	0	5	8	13	2	9	0	11	2	0	3	5	0	0	0	0	29
5:00 PM	0	2	0	2	0	12	0	12	0	0	0	0	0	0	0	0	14
5:15 PM	0	1	0	1	0	6	0	6	0	0	4	4	0	0	0	0	11
5:30 PM	0	3	6	9	0	8	0	8	0	0	0	0	0	0	0	0	17
5:45 PM	0	5	7	12	0	2	0	2	0	0	1	1	0	0	0	0	15
Total Survey	0	36	41	77	4	68	0	72	4	0	13	17	0	0	0	0	166

Heavy Vehicle Peak Hour Summary
5:00 PM to 6:00 PM

By Approach	Northbound NW Shute Rd			Southbound NW Shute Rd			Eastbound Hwy 26 EB Ramps			Westbound Hwy 26 EB Ramps			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	24	33	57	28	11	39	5	0	5	0	13	13	57
PHF	0.50			0.58			0.31			0.00			0.79

By Movement	Northbound NW Shute Rd				Southbound NW Shute Rd				Eastbound Hwy 26 EB Ramps				Westbound Hwy 26 EB Ramps				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	0	11	13	24	0	28	0	28	0	0	5	5	0	0	0	0	57
PHF	0.00	0.55	0.46	0.50	0.00	0.58	0.00	0.58	0.00	0.00	0.31	0.31	0.00	0.00	0.00	0.00	0.79

Heavy Vehicle Rolling Hour Summary
4:00 PM to 6:00 PM

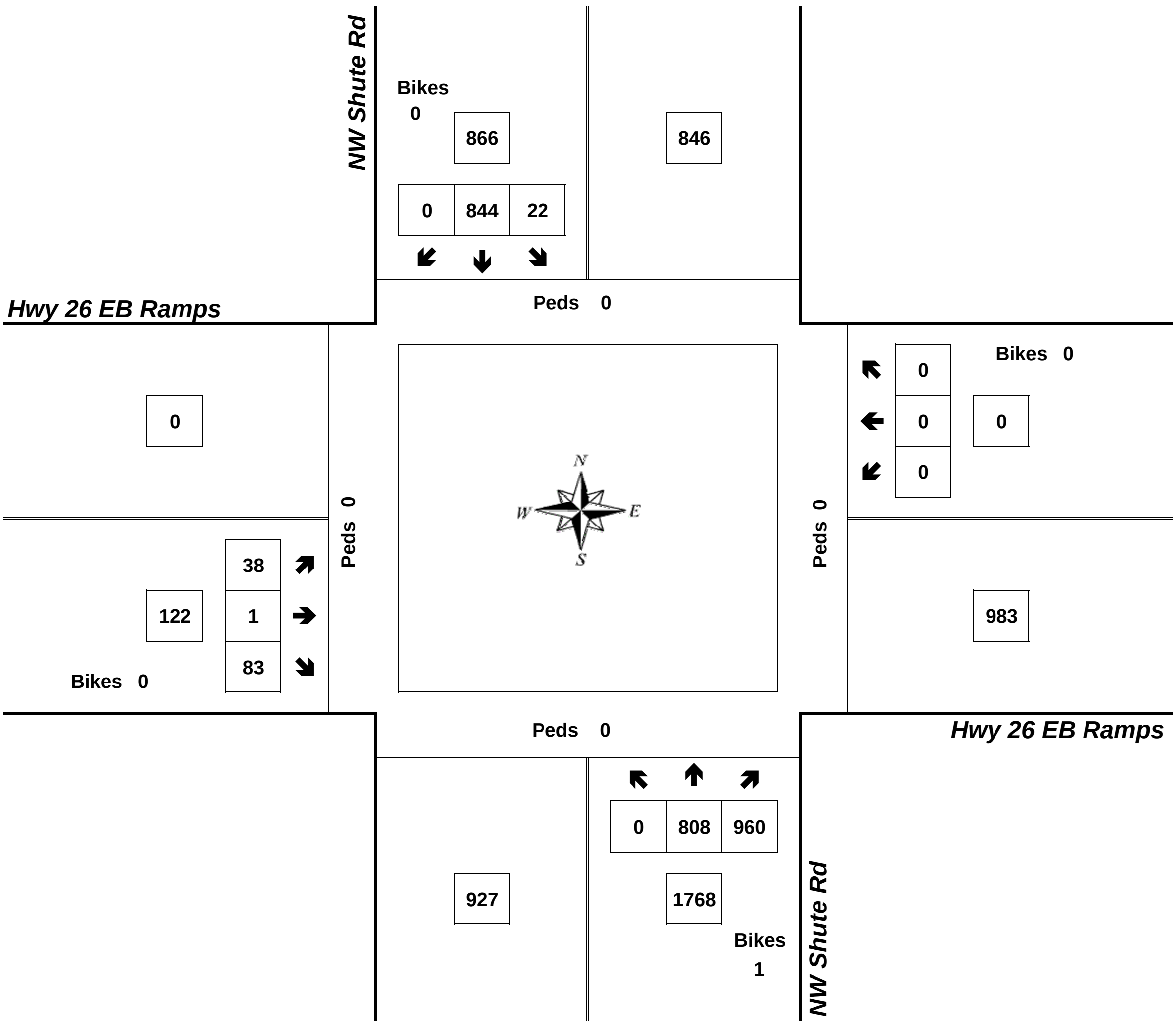
Interval Start Time	Northbound NW Shute Rd				Southbound NW Shute Rd				Eastbound Hwy 26 EB Ramps				Westbound Hwy 26 EB Ramps				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
4:00 PM	0	25	28	53	4	40	0	44	4	0	8	12	0	0	0	0	109
4:15 PM	0	22	22	44	4	39	0	43	4	0	6	10	0	0	0	0	97
4:30 PM	0	15	15	30	3	38	0	41	3	0	8	11	0	0	0	0	82
4:45 PM	0	11	14	25	2	35	0	37	2	0	7	9	0	0	0	0	71
5:00 PM	0	11	13	24	0	28	0	28	0	0	5	5	0	0	0	0	57

Peak Hour Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740

NW Shute Rd & Hwy 26 EB Ramps

5:00 PM to 6:00 PM
Thursday, March 15, 2007



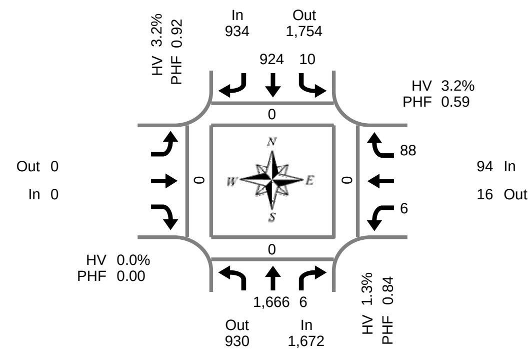
Approach	PHF	HV%	Volume
EB	0.87	4.1%	122
WB	0.00	0.0%	0
NB	0.87	1.4%	1,768
SB	0.90	3.2%	866
Intersection	0.93	2.1%	2,756

Count Period: 4:00 PM to 6:00 PM

Total Vehicle Summary

All Traffic Data Services Inc.

Clay Carney
(503) 833-2740



NW Shute Rd & NW Huffman St

Thursday, March 15, 2007

4:00 PM to 6:00 PM

Peak Hour Summary
_5:00 PM to 6:00 PM_

5-Minute Interval Summary

4:00 PM to 6:00 PM

Interval Start Time	Northbound NW Shute Rd				Southbound NW Shute Rd				Eastbound NW Huffman St				Westbound NW Huffman St				Interval Total	Pedestrians Crosswalk			
		T	R	Bikes	L	T		Bikes				Bikes	L		R	Bikes		North	South	East	West
4:00 PM		97	2	0	2	80		0				0	1		8	0	190	0	0	0	0
4:05 PM		78	1	0	2	82		0				0	2		17	0	182	0	0	0	0
4:10 PM		106	1	0	1	87		0				0	0		10	0	205	0	0	0	0
4:15 PM		103	0	0	4	77		0				0	1		6	0	191	0	0	0	0
4:20 PM		100	0	0	1	73		0				0	0		8	0	182	0	0	0	0
4:25 PM		113	3	0	3	81		0				0	2		10	0	212	0	0	0	0
4:30 PM		92	0	0	2	91		0				0	1		10	0	196	0	0	0	0
4:35 PM		98	0	0	1	97		2				0	0		8	0	204	0	0	0	0
4:40 PM		108	0	0	0	103		0				0	1		7	0	219	0	0	0	0
4:45 PM		102	0	0	1	99		0				0	0		4	0	206	0	0	0	0
4:50 PM		72	1	0	1	84		0				0	0		3	0	161	0	0	0	0
4:55 PM		104	3	0	1	72		0				0	0		7	0	187	0	0	0	0
5:00 PM		88	0	0	1	88		0				0	1		3	0	181	0	0	0	0
5:05 PM		132	0	0	1	89		0				0	0		17	0	239	0	0	0	0
5:10 PM		165	2	0	1	74		0				0	2		12	0	256	0	0	0	0
5:15 PM		162	0	0	0	80		0				0	1		8	0	251	0	0	0	0
5:20 PM		148	1	0	2	70		0				0	1		4	0	226	0	0	0	0
5:25 PM		182	2	0	1	61		0				0	0		11	0	257	0	0	0	0
5:30 PM		125	0	0	1	76		0				0	1		4	0	207	0	0	0	0
5:35 PM		152	0	0	1	83		0				0	0		9	0	245	0	0	0	0
5:40 PM		143	0	0	0	73		0				0	0		5	0	221	0	0	0	0
5:45 PM		116	1	0	1	59		0				0	0		5	0	182	0	0	0	0
5:50 PM		129	0	0	1	88		0				0	0		6	0	224	0	0	0	0
5:55 PM		124	0	0	0	83		0				0	0		4	0	211	0	0	0	0
Total Survey		2,839	17	0	29	1,950		2				0	14		186	0	5,035	0	0	0	0

15-Minute Interval Summary

4:00 PM to 6:00 PM

Interval Start Time	Northbound NW Shute Rd				Southbound NW Shute Rd				Eastbound NW Huffman St				Westbound NW Huffman St				Interval Total	Pedestrians Crosswalk			
		T	R	Bikes	L	T		Bikes				Bikes	L		R	Bikes		North	South	East	West
4:00 PM		281	4	0	5	249		0				0	3		35	0	577	0	0	0	0
4:15 PM		316	3	0	8	231		0				0	3		24	0	585	0	0	0	0
4:30 PM		298	0	0	3	291		2				0	2		25	0	619	0	0	0	0
4:45 PM		278	4	0	3	255		0				0	0		14	0	554	0	0	0	0
5:00 PM		385	2	0	3	251		0				0	3		32	0	676	0	0	0	0
5:15 PM		492	3	0	3	211		0				0	2		23	0	734	0	0	0	0
5:30 PM		420	0	0	2	232		0				0	1		18	0	673	0	0	0	0
5:45 PM		369	1	0	2	230		0				0	0		15	0	617	0	0	0	0
Total Survey		2,839	17	0	29	1,950		2				0	14		186	0	5,035	0	0	0	0

Peak Hour Summary

5:00 PM to 6:00 PM

By Approach	Northbound NW Shute Rd				Southbound NW Shute Rd				Eastbound NW Huffman St				Westbound NW Huffman St				Total
	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes	
Volume	1,672	930	2,602	0	934	1,754	2,688	0	0	0	0	0	94	16	110	0	2,700
%HV	1.3%				3.2%				0.0%				3.2%				2.0%
PHF	0.84				0.92				0.00				0.59				0.90

Pedestrians Crosswalk			
North	South	East	West
0	0	0	0

By Movement	Northbound NW Shute Rd				Southbound NW Shute Rd				Eastbound NW Huffman St				Westbound NW Huffman St				Total
		T	R	Total	L	T		Total				Total	L		R	Total	
Volume		1,666	6	1,672	10	924		934				0	6		88	94	2,700
%HV	NA	1.3%	0.0%	1.3%	20.0%	3.0%	NA	3.2%	NA	NA	NA	0.0%	0.0%	NA	3.4%	3.2%	2.0%
PHF		0.85	0.50	0.84	0.63	0.92		0.92				0.00	0.38		0.59	0.59	0.90

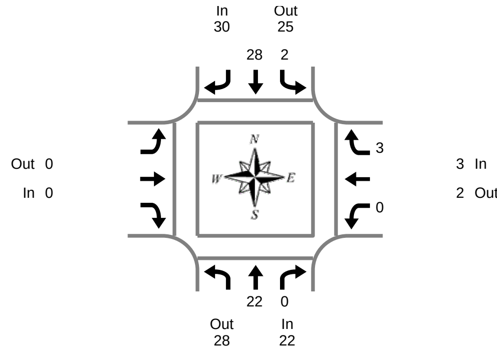
Rolling Hour Summary

4:00 PM to 6:00 PM

Interval Start Time	Northbound NW Shute Rd				Southbound NW Shute Rd				Eastbound NW Huffman St				Westbound NW Huffman St				Interval Total	Pedestrians Crosswalk			
		T	R	Bikes	L	T		Bikes				Bikes	L		R	Bikes		North	South	East	West
4:00 PM		1,173	11	0	19	1,026		2				0	8		98	0	2,335	0	0	0	0
4:15 PM		1,277	9	0	17	1,028		2				0	8		95	0	2,434	0	0	0	0
4:30 PM		1,453	9	0	12	1,008		2				0	7		94	0	2,583	0	0	0	0
4:45 PM		1,575	9	0	11	949		0				0	6		87	0	2,637	0	0	0	0
5:00 PM		1,666	6	0	10	924		0				0	6		88	0	2,700	0	0	0	0

Heavy Vehicle Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740



Peak Hour Summary
5:00 PM to 6:00 PM

NW Shute Rd & NW Huffman St

Thursday, March 15, 2007
4:00 PM to 6:00 PM

Heavy Vehicle 5-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound NW Shute Rd				Southbound NW Shute Rd				Eastbound NW Huffman St				Westbound NW Huffman St				Interval Total
		T	R	Total	L	T		Total				Total	L		R	Total	
4:00 PM		6	0	6	0	7		7				0	0		0	0	13
4:05 PM		4	0	4	0	3		3				0	0		1	1	8
4:10 PM		4	0	4	1	2		3				0	0		0	0	7
4:15 PM		0	0	0	1	4		5				0	0		1	1	6
4:20 PM		3	0	3	0	4		4				0	0		1	1	8
4:25 PM		3	1	4	1	3		4				0	1		0	1	9
4:30 PM		3	0	3	1	4		5				0	0		0	0	8
4:35 PM		3	0	3	0	3		3				0	0		0	0	6
4:40 PM		8	0	8	0	2		2				0	0		2	2	12
4:45 PM		1	0	1	0	6		6				0	0		2	2	9
4:50 PM		1	0	1	1	4		5				0	0		0	0	6
4:55 PM		5	1	6	0	1		1				0	0		2	2	9
5:00 PM		3	0	3	0	5		5				0	0		0	0	8
5:05 PM		0	0	0	0	3		3				0	0		0	0	3
5:10 PM		0	0	0	0	4		4				0	0		0	0	4
5:15 PM		1	0	1	0	4		4				0	0		0	0	5
5:20 PM		1	0	1	0	1		1				0	0		0	0	2
5:25 PM		2	0	2	1	1		2				0	0		0	0	4
5:30 PM		0	0	0	1	1		2				0	0		0	0	2
5:35 PM		4	0	4	0	3		3				0	0		0	0	7
5:40 PM		2	0	2	0	3		3				0	0		1	1	6
5:45 PM		2	0	2	0	1		1				0	0		1	1	4
5:50 PM		3	0	3	0	1		1				0	0		0	0	4
5:55 PM		4	0	4	0	1		1				0	0		1	1	6
Total Survey		63	2	65	7	71		78				0	1		12	13	156

Heavy Vehicle 15-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound NW Shute Rd				Southbound NW Shute Rd				Eastbound NW Huffman St				Westbound NW Huffman St				Interval Total
		T	R	Total	L	T		Total				Total	L		R	Total	
4:00 PM		14	0	14	1	12		13				0	0		1	1	28
4:15 PM		6	1	7	2	11		13				0	1		2	3	23
4:30 PM		14	0	14	1	9		10				0	0		2	2	26
4:45 PM		7	1	8	1	11		12				0	0		4	4	24
5:00 PM		3	0	3	0	12		12				0	0		0	0	15
5:15 PM		4	0	4	1	6		7				0	0		0	0	11
5:30 PM		6	0	6	1	7		8				0	0		1	1	15
5:45 PM		9	0	9	0	3		3				0	0		2	2	14
Total Survey		63	2	65	7	71		78				0	1		12	13	156

Heavy Vehicle Peak Hour Summary
5:00 PM to 6:00 PM

By Approach	Northbound NW Shute Rd			Southbound NW Shute Rd			Eastbound NW Huffman St			Westbound NW Huffman St			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	22	28	50	30	25	55	0	0	0	3	2	5	55
PHF	0.61			0.63			0.00			0.38			0.81

By Movement	Northbound NW Shute Rd				Southbound NW Shute Rd				Eastbound NW Huffman St				Westbound NW Huffman St				Total
		T	R	Total	L	T		Total				Total	L		R	Total	
Volume		22	0	22	2	28		30				0	0		3	3	55
PHF		0.61	0.00	0.61	0.25	0.58		0.63				0.00	0.00		0.38	0.38	0.81

Heavy Vehicle Rolling Hour Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound NW Shute Rd				Southbound NW Shute Rd				Eastbound NW Huffman St				Westbound NW Huffman St				Interval Total
		T	R	Total	L	T		Total				Total	L		R	Total	
4:00 PM		41	2	43	5	43		48				0	1		9	10	101
4:15 PM		30	2	32	4	43		47				0	1		8	9	88
4:30 PM		28	1	29	3	38		41				0	0		6	6	76
4:45 PM		20	1	21	3	36		39				0	0		5	5	65
5:00 PM		22	0	22	2	28		30				0	0		3	3	55

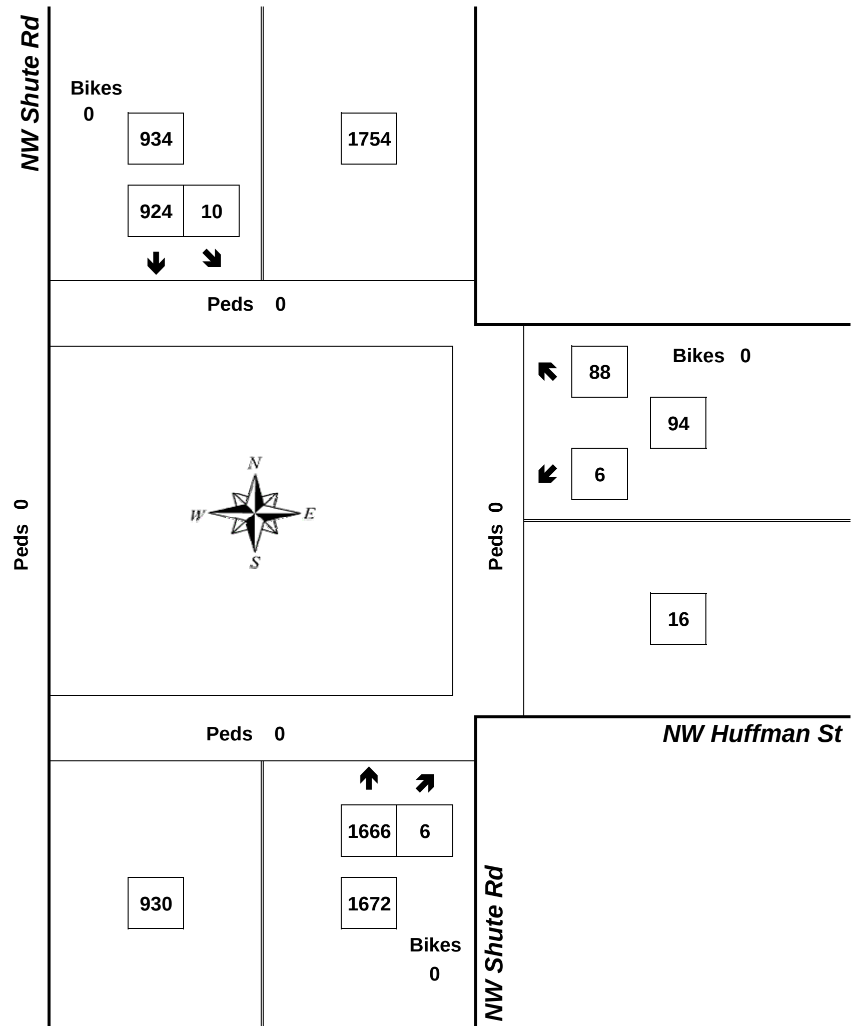
Peak Hour Summary

All Traffic Data Services Inc.

Clay Carney
(503) 833-2740

NW Shute Rd & NW Huffman St

5:00 PM to 6:00 PM
Thursday, March 15, 2007



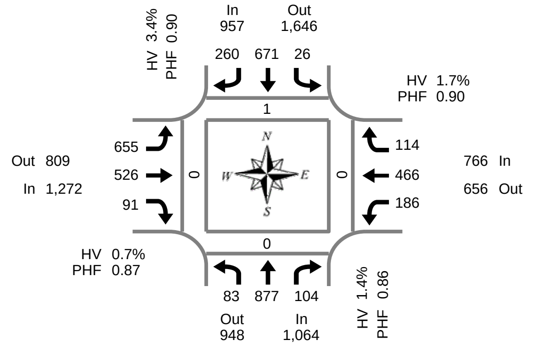
Approach	PHF	HV%	Volume
EB	0.00	0.0%	0
WB	0.59	3.2%	94
NB	0.84	1.3%	1,672
SB	0.92	3.2%	934
Intersection	0.90	2.0%	2,700

Count Period: 4:00 PM to 6:00 PM

Total Vehicle Summary

All Traffic Data Services Inc.

Clay Carney
(503) 833-2740



Peak Hour Summary
5:00 PM to 6:00 PM

NW Shute Rd & NW Evergreen Pkwy

Thursday, March 15, 2007
4:00 PM to 6:00 PM

5-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound NW Shute Rd				Southbound NW Shute Rd				Eastbound NW Evergreen Pkwy				Westbound NW Evergreen Pkwy				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
4:00 PM	6	38	9	0	2	25	15	0	17	28	7	0	7	45	6	0	205	0	0	0	0
4:05 PM	11	58	8	0	2	75	21	0	16	16	6	0	21	29	2	0	265	0	0	0	0
4:10 PM	5	56	7	0	0	65	16	0	55	23	5	0	22	29	2	0	285	0	0	0	0
4:15 PM	4	50	6	0	1	58	26	0	42	38	6	0	9	34	9	0	283	0	0	0	0
4:20 PM	7	74	12	0	3	56	24	0	25	23	1	0	13	33	5	0	276	0	0	0	0
4:25 PM	15	65	11	0	1	56	22	0	38	28	8	0	11	16	16	0	287	0	0	0	0
4:30 PM	1	64	10	0	4	61	22	2	22	19	4	0	9	28	6	0	250	0	0	0	0
4:35 PM	9	66	11	0	1	75	27	0	30	24	11	0	17	40	5	0	316	0	0	0	1
4:40 PM	11	48	16	0	5	67	23	0	42	31	6	0	15	56	6	0	326	0	0	0	0
4:45 PM	6	57	15	0	4	84	18	0	51	26	2	0	13	29	3	1	308	0	0	0	0
4:50 PM	5	53	10	0	2	72	19	0	43	39	5	0	15	24	3	0	290	0	0	0	0
4:55 PM	6	62	12	0	0	59	22	0	36	43	9	0	14	43	7	0	313	0	0	0	0
5:00 PM	9	50	11	0	2	69	23	0	31	33	5	0	19	40	10	0	302	0	0	0	0
5:05 PM	9	73	9	0	2	70	19	0	63	42	9	0	18	41	11	0	366	0	0	0	0
5:10 PM	7	88	6	0	3	63	15	0	60	49	5	0	15	45	12	0	368	0	0	0	0
5:15 PM	8	90	9	0	4	54	19	0	65	52	4	0	13	41	14	0	373	0	0	0	0
5:20 PM	3	90	7	0	2	57	16	0	47	49	12	1	10	47	15	0	355	0	0	0	0
5:25 PM	6	68	12	0	2	45	21	0	77	54	4	0	18	38	9	0	354	0	0	0	0
5:30 PM	8	77	7	0	4	54	23	0	48	37	8	0	22	41	11	0	340	0	0	0	0
5:35 PM	10	81	7	0	1	47	30	0	58	31	9	0	13	37	11	0	335	0	0	0	0
5:40 PM	6	65	7	0	0	47	19	0	63	44	11	0	23	36	5	1	326	0	0	0	0
5:45 PM	3	66	9	0	0	53	24	0	61	42	8	0	15	32	4	0	317	0	0	0	0
5:50 PM	6	57	10	0	2	50	27	0	35	63	9	0	8	39	3	0	309	1	0	0	0
5:55 PM	8	72	10	0	4	62	24	0	47	30	7	0	12	29	9	0	314	0	0	0	0
Total Survey	169	1,568	231	0	51	1,424	515	2	1,072	864	161	1	352	872	184	2	7,463	1	0	0	1

15-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound NW Shute Rd				Southbound NW Shute Rd				Eastbound NW Evergreen Pkwy				Westbound NW Evergreen Pkwy				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
4:00 PM	22	152	24	0	4	165	52	0	88	67	18	0	50	103	10	0	755	0	0	0	0
4:15 PM	26	189	29	0	5	170	72	0	105	89	15	0	33	83	30	0	846	0	0	0	0
4:30 PM	21	178	37	0	10	203	72	2	94	74	21	0	41	124	17	0	892	0	0	0	1
4:45 PM	17	172	37	0	6	215	59	0	130	108	16	0	42	96	13	1	911	0	0	0	0
5:00 PM	25	211	26	0	7	202	57	0	154	124	19	0	52	126	33	0	1,036	0	0	0	0
5:15 PM	17	248	28	0	8	156	56	0	189	155	20	1	41	126	38	0	1,082	0	0	0	0
5:30 PM	24	223	21	0	5	148	72	0	169	112	28	0	58	114	27	1	1,001	0	0	0	0
5:45 PM	17	195	29	0	6	165	75	0	143	135	24	0	35	100	16	0	940	1	0	0	0
Total Survey	169	1,568	231	0	51	1,424	515	2	1,072	864	161	1	352	872	184	2	7,463	1	0	0	1

Peak Hour Summary
5:00 PM to 6:00 PM

By Approach	Northbound NW Shute Rd				Southbound NW Shute Rd				Eastbound NW Evergreen Pkwy				Westbound NW Evergreen Pkwy				Total
	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes	
Volume	1,064	948	2,012	0	957	1,646	2,603	0	1,272	809	2,081	1	766	656	1,422	1	4,059
%HV	1.4%				3.4%				0.7%				1.7%				1.7%
PHF	0.86				0.90				0.87				0.90				0.92

Pedestrians Crosswalk			
North	South	East	West
1	0	0	0

By Movement	Northbound NW Shute Rd				Southbound NW Shute Rd				Eastbound NW Evergreen Pkwy				Westbound NW Evergreen Pkwy				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	83	877	104	1,064	26	671	260	957	655	526	91	1,272	186	466	114	766	4,059
%HV	1.2%	1.6%	0.0%	1.4%	3.8%	3.6%	3.1%	3.4%	0.8%	0.6%	1.1%	0.7%	2.7%	1.1%	2.6%	1.7%	1.7%
PHF	0.83	0.82	0.90	0.86	0.72	0.83	0.87	0.90	0.87	0.85	0.81	0.87	0.80	0.88	0.70	0.90	0.92

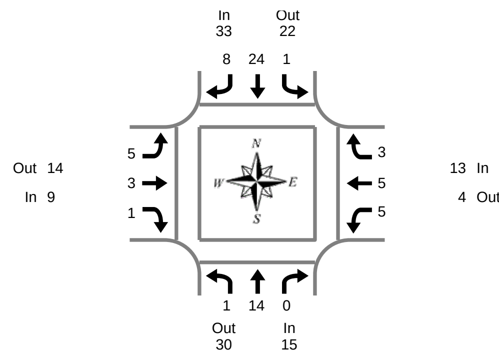
Rolling Hour Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound NW Shute Rd				Southbound NW Shute Rd				Eastbound NW Evergreen Pkwy				Westbound NW Evergreen Pkwy				Interval Total	Pedestrians Crosswalk			
	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes	L	T	R	Bikes		North	South	East	West
4:00 PM	86	691	127	0	25	753	255	2	417	338	70	0	166	406	70	1	3,404	0	0	0	1
4:15 PM	89	750	129	0	28	790	260	2	483	395	71	0	168	429	93	1	3,685	0	0	0	1
4:30 PM	80	809	128	0	31	776	244	2	567	461	76	1	176	472	101	1	3,921	0	0	0	1
4:45 PM	83	854	112	0	26	721	244	0	642	499	83	1	193	462	111	2	4,030	0	0	0	0
5:00 PM	83	877	104	0	26	671	260	0	655	526	91	1	186	466	114	1	4,059	1	0	0	0

Heavy Vehicle Summary

All Traffic Data Services Inc.

Clay Carney
(503) 833-2740



Peak Hour Summary
5:00 PM to 6:00 PM

NW Shute Rd & NW Evergreen Pkwy

Thursday, March 15, 2007
4:00 PM to 6:00 PM

Heavy Vehicle 5-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound NW Shute Rd				Southbound NW Shute Rd				Eastbound NW Evergreen Pkwy				Westbound NW Evergreen Pkwy				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
4:00 PM	0	5	0	5	0	3	1	4	0	0	0	0	0	1	1	2	11
4:05 PM	0	2	0	2	0	4	1	5	2	1	0	3	1	1	0	2	12
4:10 PM	0	3	0	3	0	3	0	3	1	3	0	4	0	1	0	1	11
4:15 PM	1	0	0	1	0	2	0	2	0	0	1	1	0	1	0	1	5
4:20 PM	0	4	2	6	0	4	1	5	0	0	0	0	0	2	0	2	13
4:25 PM	0	1	0	1	0	3	0	3	1	1	0	2	0	1	0	1	7
4:30 PM	0	3	0	3	0	4	2	6	0	0	0	0	1	1	1	3	12
4:35 PM	0	4	0	4	0	1	0	1	0	0	0	0	0	1	0	1	6
4:40 PM	0	3	0	3	0	1	1	2	3	1	0	4	0	0	0	0	9
4:45 PM	0	1	2	3	0	2	2	4	1	1	0	2	0	0	1	1	10
4:50 PM	0	1	0	1	0	4	0	4	1	1	0	2	0	1	0	1	8
4:55 PM	0	2	0	2	0	2	0	2	0	1	0	1	0	0	1	1	6
5:00 PM	0	2	0	2	0	4	1	5	0	0	0	0	1	2	0	3	10
5:05 PM	0	0	0	0	0	4	0	4	0	0	1	1	1	0	1	2	7
5:10 PM	0	1	0	1	0	3	0	3	0	0	0	0	1	0	0	1	5
5:15 PM	0	1	0	1	1	1	1	3	0	1	0	1	1	0	0	1	6
5:20 PM	1	0	0	1	0	3	1	4	1	0	0	1	0	0	0	0	6
5:25 PM	0	0	0	0	0	2	0	2	1	0	0	1	1	2	0	3	6
5:30 PM	0	0	0	0	0	1	0	1	0	0	0	0	0	0	1	1	2
5:35 PM	0	2	0	2	0	1	1	2	1	0	0	1	0	1	0	1	6
5:40 PM	0	2	0	2	0	2	2	4	0	1	0	1	0	0	0	0	7
5:45 PM	0	1	0	1	0	2	1	3	2	0	0	2	0	0	0	0	6
5:50 PM	0	2	0	2	0	0	1	1	0	1	0	1	0	0	0	0	4
5:55 PM	0	3	0	3	0	1	0	1	0	0	0	0	0	0	1	1	5
Total Survey	2	43	4	49	1	57	16	74	14	12	2	28	7	15	7	29	180

Heavy Vehicle 15-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound NW Shute Rd				Southbound NW Shute Rd				Eastbound NW Evergreen Pkwy				Westbound NW Evergreen Pkwy				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
4:00 PM	0	10	0	10	0	10	2	12	3	4	0	7	1	3	1	5	34
4:15 PM	1	5	2	8	0	9	1	10	1	1	1	3	0	4	0	4	25
4:30 PM	0	10	0	10	0	6	3	9	3	1	0	4	1	2	1	4	27
4:45 PM	0	4	2	6	0	8	2	10	2	3	0	5	0	1	2	3	24
5:00 PM	0	3	0	3	0	11	1	12	0	0	1	1	3	2	1	6	22
5:15 PM	1	1	0	2	1	6	2	9	2	1	0	3	2	2	0	4	18
5:30 PM	0	4	0	4	0	4	3	7	1	1	0	2	0	1	1	2	15
5:45 PM	0	6	0	6	0	3	2	5	2	1	0	3	0	0	1	1	15
Total Survey	2	43	4	49	1	57	16	74	14	12	2	28	7	15	7	29	180

Heavy Vehicle Peak Hour Summary
5:00 PM to 6:00 PM

By Approach	Northbound NW Shute Rd			Southbound NW Shute Rd			Eastbound NW Evergreen Pkwy			Westbound NW Evergreen Pkwy			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	15	30	45	33	22	55	9	14	23	13	4	17	70
PHF	0.63			0.69			0.56			0.54			0.80

By Movement	Northbound NW Shute Rd				Southbound NW Shute Rd				Eastbound NW Evergreen Pkwy				Westbound NW Evergreen Pkwy				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	1	14	0	15	1	24	8	33	5	3	1	9	5	5	3	13	70
PHF	0.25	0.58	0.00	0.63	0.25	0.55	0.50	0.69	0.42	0.38	0.25	0.56	0.42	0.42	0.75	0.54	0.80

Heavy Vehicle Rolling Hour Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound NW Shute Rd				Southbound NW Shute Rd				Eastbound NW Evergreen Pkwy				Westbound NW Evergreen Pkwy				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
4:00 PM	1	29	4	34	0	33	8	41	9	9	1	19	2	10	4	16	110
4:15 PM	1	22	4	27	0	34	7	41	6	5	2	13	4	9	4	17	98
4:30 PM	1	18	2	21	1	31	8	40	7	5	1	13	6	7	4	17	91
4:45 PM	1	12	2	15	1	29	8	38	5	5	1	11	5	6	4	15	79
5:00 PM	1	14	0	15	1	24	8	33	5	3	1	9	5	5	3	13	70

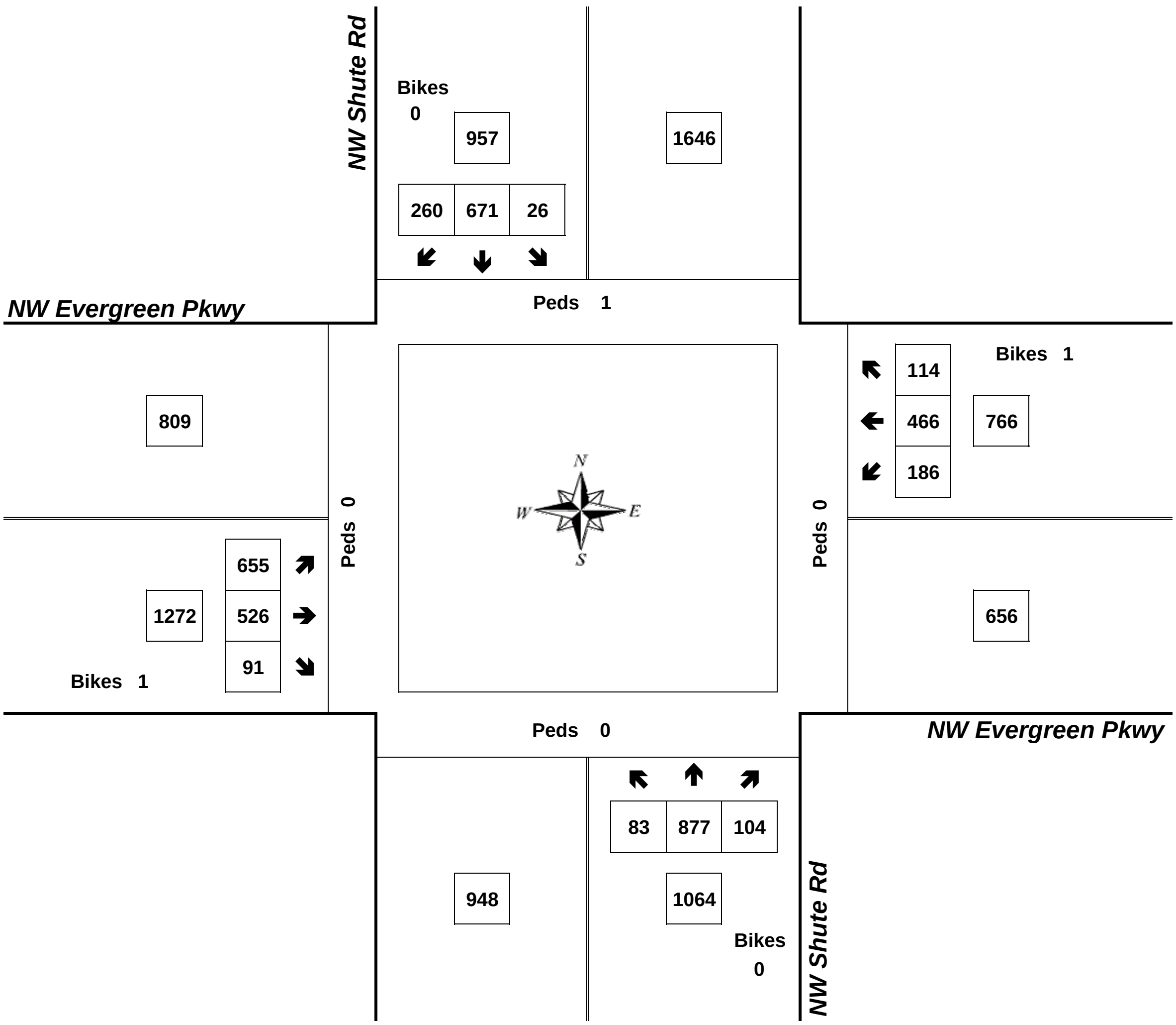
Peak Hour Summary

All Traffic Data Services Inc.

Clay Carney
(503) 833-2740

NW Shute Rd & NW Evergreen Pkwy

5:00 PM to 6:00 PM
Thursday, March 15, 2007



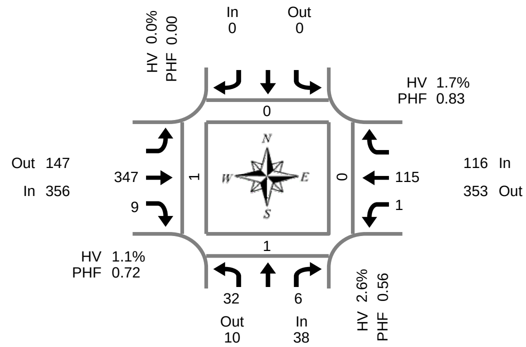
Approach	PHF	HV%	Volume
EB	0.87	0.7%	1,272
WB	0.90	1.7%	766
NB	0.86	1.4%	1,064
SB	0.90	3.4%	957
Intersection	0.92	1.7%	4,059

Count Period: 4:00 PM to 6:00 PM

Total Vehicle Summary

All Traffic Data Services Inc.

Clay Carney
(503) 833-2740



Peak Hour Summary
4:50 PM to 5:50 PM

NW Century Blvd & NW Jacobson Rd

Wednesday, March 21, 2007
4:00 PM to 6:00 PM

5-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound NW Century Blvd				Southbound NW Century Blvd				Eastbound NW Jacobson Rd				Westbound NW Jacobson Rd				Interval Total	Pedestrians Crosswalk			
	L		R	Bikes				Bikes		T	R	Bikes	L	T		Bikes		North	South	East	West
4:00 PM	3		1	0				0		7	0	0	0	19		0	30	0	0	0	0
4:05 PM	5		0	0				0		8	3	0	0	9		0	25	0	0	0	0
4:10 PM	4		1	0				0		21	5	0	0	9		0	40	0	1	0	0
4:15 PM	1		3	0				0		25	5	0	0	9		0	43	0	0	0	0
4:20 PM	0		0	0				0		15	2	0	0	13		0	30	0	0	0	0
4:25 PM	1		0	0				0		15	1	0	0	10		0	27	0	0	0	0
4:30 PM	2		1	0				0		19	0	0	0	12		0	34	0	0	0	0
4:35 PM	1		0	0				0		21	0	0	1	17		0	40	0	0	0	0
4:40 PM	2		0	0				0		17	0	0	0	6		0	25	0	0	0	0
4:45 PM	5		0	0				0		13	1	0	0	8		0	27	0	0	0	0
4:50 PM	3		0	0				0		21	0	0	0	11		0	35	0	0	0	0
4:55 PM	3		0	0				0		14	2	0	0	8		0	27	0	0	0	0
5:00 PM	2		0	0				0		21	0	0	0	10		0	33	0	0	0	0
5:05 PM	4		1	0				0		33	0	0	0	9		0	47	0	1	0	0
5:10 PM	7		0	0				0		35	0	0	0	6		0	48	0	0	0	0
5:15 PM	4		1	0				0		20	0	0	0	15		0	40	0	0	0	0
5:20 PM	0		0	0				0		43	1	0	0	7		0	51	0	0	0	1
5:25 PM	0		0	0				0		37	2	0	0	13		0	52	0	0	0	0
5:30 PM	2		1	0				0		39	2	0	0	6		0	50	0	0	0	0
5:35 PM	2		1	0				0		26	1	0	0	11		0	41	0	0	0	0
5:40 PM	2		1	0				0		35	1	0	1	7		0	47	0	0	0	0
5:45 PM	3		1	0				0		23	0	0	0	12		0	39	0	0	0	0
5:50 PM	1		0	0				0		14	0	0	0	8		0	23	0	0	0	0
5:55 PM	0		0	0				0		26	0	0	0	9		0	35	0	0	0	0
Total Survey	57		12	0				0		548	26	0	2	244		0	889	0	2	0	1

15-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound NW Century Blvd				Southbound NW Century Blvd				Eastbound NW Jacobson Rd				Westbound NW Jacobson Rd				Interval Total	Pedestrians Crosswalk			
	L		R	Bikes				Bikes		T	R	Bikes	L	T		Bikes		North	South	East	West
4:00 PM	12		2	0				0		36	8	0	0	37		0	95	0	1	0	0
4:15 PM	2		3	0				0		55	8	0	0	32		0	100	0	0	0	0
4:30 PM	5		1	0				0		57	0	0	1	35		0	99	0	0	0	0
4:45 PM	11		0	0				0		48	3	0	0	27		0	89	0	0	0	0
5:00 PM	13		1	0				0		89	0	0	0	25		0	128	0	1	0	0
5:15 PM	4		1	0				0		100	3	0	0	35		0	143	0	0	0	1
5:30 PM	6		3	0				0		100	4	0	1	24		0	138	0	0	0	0
5:45 PM	4		1	0				0		63	0	0	0	29		0	97	0	0	0	0
Total Survey	57		12	0				0		548	26	0	2	244		0	889	0	2	0	1

Peak Hour Summary
4:50 PM to 5:50 PM

By Approach	Northbound NW Century Blvd				Southbound NW Century Blvd				Eastbound NW Jacobson Rd				Westbound NW Jacobson Rd				Total	Pedestrians Crosswalk			
	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes	In	Out	Total	Bikes		North	South	East	West
Volume	38	10	48	0	0	0	0	0	356	147	503	0	116	353	469	0	510	0	1	0	1
%HV	2.6%				0.0%				1.1%				1.7%				1.4%				
PHF	0.56				0.00				0.72				0.83				0.83				

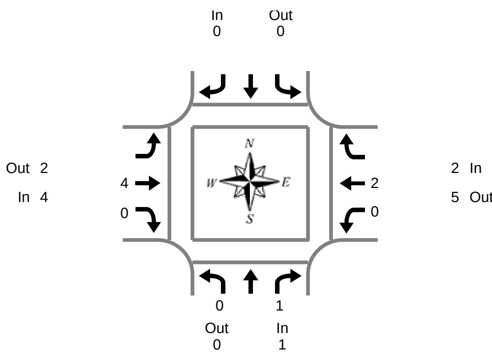
By Movement	Northbound NW Century Blvd				Southbound NW Century Blvd				Eastbound NW Jacobson Rd				Westbound NW Jacobson Rd				Total
	L		R	Total				Total		T	R	Total	L	T		Total	
Volume	32		6	38				0		347	9	356	1	115		116	510
%HV	0.0%	NA	16.7%	2.6%	NA	NA	NA	0.0%	NA	1.2%	0.0%	1.1%	0.0%	1.7%	NA	1.7%	1.4%
PHF	0.53		0.50	0.56				0.00		0.73	0.45	0.72	0.25	0.82		0.83	0.83

Rolling Hour Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound NW Century Blvd				Southbound NW Century Blvd				Eastbound NW Jacobson Rd				Westbound NW Jacobson Rd				Interval Total	Pedestrians Crosswalk			
	L		R	Bikes				Bikes		T	R	Bikes	L	T		Bikes		North	South	East	West
4:00 PM	30		6	0				0		196	19	0	1	131		0	383	0	1	0	0
4:15 PM	31		5	0				0		249	11	0	1	119		0	416	0	1	0	0
4:30 PM	33		3	0				0		294	6	0	1	122		0	459	0	1	0	1
4:45 PM	34		5	0				0		337	10	0	1	111		0	498	0	1	0	1
5:00 PM	27		6	0				0		352	7	0	1	113		0	506	0	1	0	1

Heavy Vehicle Summary

All Traffic Data Services Inc.
Clay Carney
(503) 833-2740



Peak Hour Summary
4:50 PM to 5:50 PM

NW Century Blvd & NW Jacobson Rd

Wednesday, March 21, 2007
4:00 PM to 6:00 PM

Heavy Vehicle 5-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound NW Century Blvd				Southbound NW Century Blvd				Eastbound NW Jacobson Rd				Westbound NW Jacobson Rd				Interval Total
	L		R	Total				Total		T	R	Total	L	T		Total	
4:00 PM	0		0	0				0		2	0	2	0	1		1	3
4:05 PM	0		0	0				0		0	2	2	0	1		1	3
4:10 PM	0		0	0				0		1	2	3	0	2		2	5
4:15 PM	0		0	0				0		2	0	2	0	0		0	2
4:20 PM	0		0	0				0		0	1	1	0	0		0	1
4:25 PM	0		0	0				0		0	0	0	0	1		1	1
4:30 PM	0		0	0				0		0	0	0	0	0		0	0
4:35 PM	0		0	0				0		1	0	1	0	1		1	2
4:40 PM	0		0	0				0		0	0	0	0	0		0	0
4:45 PM	1		0	1				0		1	0	1	0	0		0	2
4:50 PM	0		0	0				0		2	0	2	0	0		0	2
4:55 PM	0		0	0				0		0	0	0	0	0		0	0
5:00 PM	0		0	0				0		0	0	0	0	0		0	0
5:05 PM	0		0	0				0		1	0	1	0	0		0	1
5:10 PM	0		0	0				0		0	0	0	0	0		0	0
5:15 PM	0		0	0				0		0	0	0	0	1		1	1
5:20 PM	0		0	0				0		0	0	0	0	0		0	0
5:25 PM	0		0	0				0		0	0	0	0	0		0	0
5:30 PM	0		0	0				0		1	0	1	0	0		0	1
5:35 PM	0		0	0				0		0	0	0	0	1		1	1
5:40 PM	0		0	0				0		0	0	0	0	0		0	0
5:45 PM	0		1	1				0		0	0	0	0	0		0	1
5:50 PM	0		0	0				0		0	0	0	0	0		0	0
5:55 PM	0		0	0				0		0	0	0	0	0		0	0
Total Survey	1		1	2				0		11	5	16	0	8		8	26

Heavy Vehicle 15-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound NW Century Blvd				Southbound NW Century Blvd				Eastbound NW Jacobson Rd				Westbound NW Jacobson Rd				Interval Total
	L		R	Total				Total		T	R	Total	L	T		Total	
4:00 PM	0		0	0				0		3	4	7	0	4		4	11
4:15 PM	0		0	0				0		2	1	3	0	1		1	4
4:30 PM	0		0	0				0		1	0	1	0	1		1	2
4:45 PM	1		0	1				0		3	0	3	0	0		0	4
5:00 PM	0		0	0				0		1	0	1	0	0		0	1
5:15 PM	0		0	0				0		0	0	0	0	1		1	1
5:30 PM	0		0	0				0		1	0	1	0	1		1	2
5:45 PM	0		1	1				0		0	0	0	0	0		0	1
Total Survey	1		1	2				0		11	5	16	0	8		8	26

Heavy Vehicle Peak Hour Summary
4:50 PM to 5:50 PM

By Approach	Northbound NW Century Blvd			Southbound NW Century Blvd			Eastbound NW Jacobson Rd			Westbound NW Jacobson Rd			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	1	0	1	0	0	0	4	2	6	2	5	7	7
PHF	0.25			0.00			0.50			0.50			0.88

By Movement	Northbound NW Century Blvd				Southbound NW Century Blvd				Eastbound NW Jacobson Rd				Westbound NW Jacobson Rd				Total
	L		R	Total				Total		T	R	Total	L	T		Total	
Volume	0		1	1				0		4	0	4	0	2		2	7
PHF	0.00		0.25	0.25				0.00		0.50	0.00	0.50	0.00	0.50		0.50	0.88

Heavy Vehicle Rolling Hour Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound NW Century Blvd				Southbound NW Century Blvd				Eastbound NW Jacobson Rd				Westbound NW Jacobson Rd				Interval Total
	L		R	Total				Total		T	R	Total	L	T		Total	
4:00 PM	1		0	1				0		9	5	14	0	6		6	21
4:15 PM	1		0	1				0		7	1	8	0	2		2	11
4:30 PM	1		0	1				0		5	0	5	0	2		2	8
4:45 PM	1		0	1				0		5	0	5	0	2		2	8
5:00 PM	0		1	1				0		2	0	2	0	2		2	5

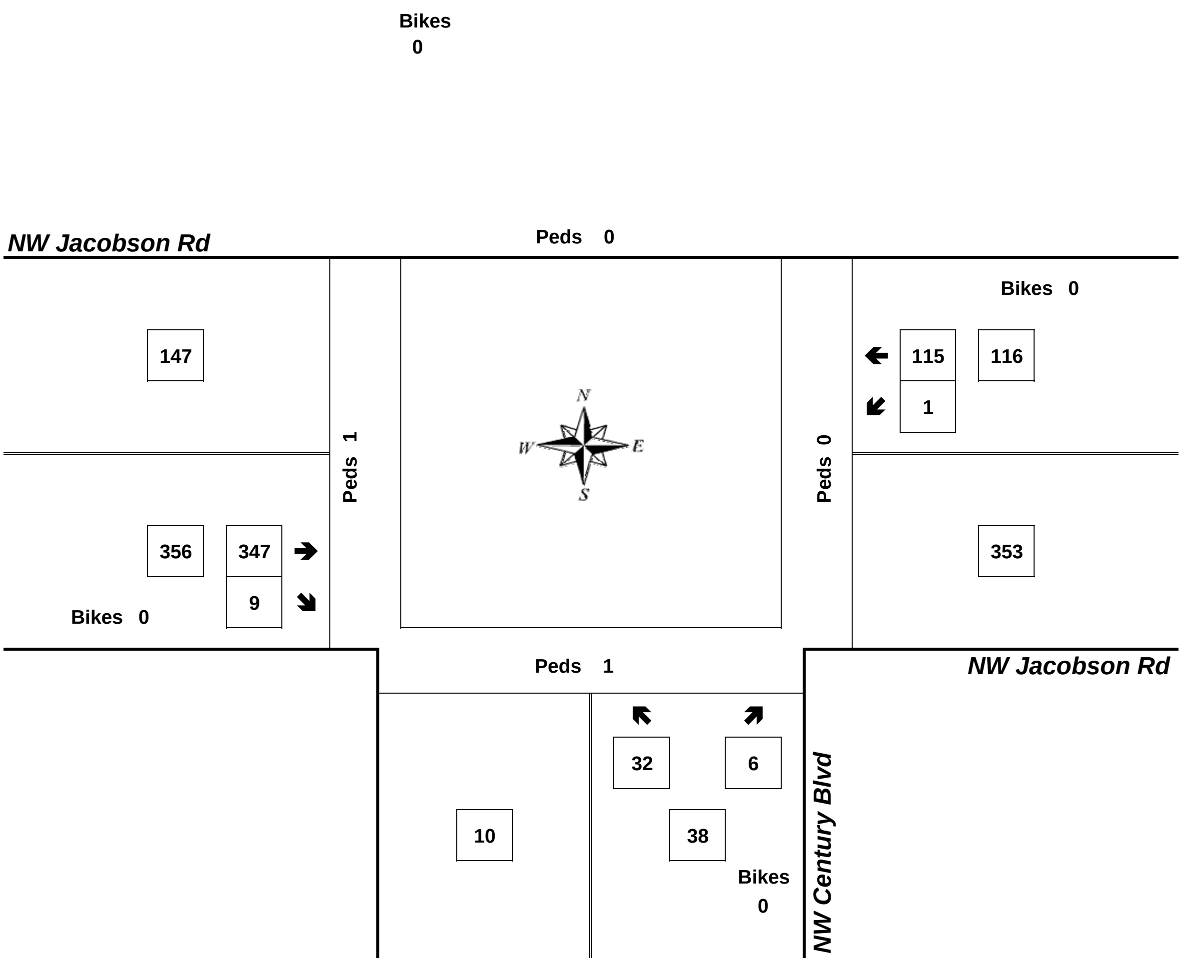
Peak Hour Summary

All Traffic Data Services Inc.

Clay Carney
(503) 833-2740

NW Century Blvd & NW Jacobson Rd

4:50 PM to 5:50 PM
Wednesday, March 21, 2007

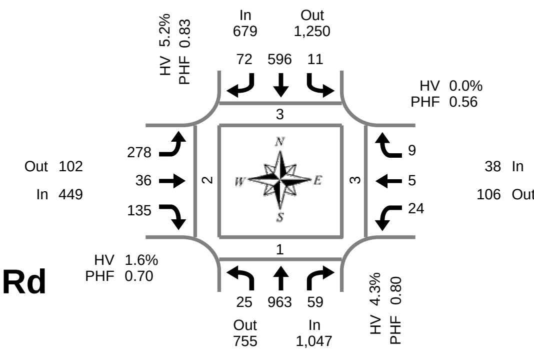


Approach	PHF	HV%	Volume
EB	0.72	1.1%	356
WB	0.83	1.7%	116
NB	0.56	2.6%	38
SB	0.00	0.0%	0
Intersection	0.83	1.4%	510

Count Period: 4:00 PM to 6:00 PM

Total Vehicle Summary

Clay Carney
(503) 833-2740



Peak Hour Summary
5:00 PM to 6:00 PM

NW Cornelius Pass Rd & NW Jacobson Rd

Wednesday, March 21, 2007
4:00 PM to 6:00 PM

5-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound NW Cornelius Pass Rd L	T	R	Bikes	Southbound NW Cornelius Pass Rd L	T	R	Bikes	Eastbound NW Jacobson Rd L	T	R	Bikes	Westbound NW Jacobson Rd L	T	R	Bikes	Interval Total	Pedestrians Crosswalk North	South	East	West
4:00 PM	2	56	2	0	0	43	13	0	9	2	7	0	1	0	0	0	135	1	0	0	0
4:05 PM	2	64	1	1	0	32	3	0	9	0	2	0	3	0	0	0	116	0	0	0	0
4:10 PM	2	85	3	0	1	47	6	0	11	1	8	0	6	0	1	0	171	0	0	0	0
4:15 PM	3	77	5	0	1	41	5	1	20	0	8	0	2	1	1	0	164	0	1	0	0
4:20 PM	4	62	0	0	0	51	8	0	13	2	11	0	1	1	0	0	153	0	0	1	0
4:25 PM	0	78	3	0	0	38	4	0	12	1	9	0	1	1	1	0	148	0	0	0	0
4:30 PM	4	66	5	2	1	49	4	0	14	0	14	0	2	0	0	0	159	0	0	0	0
4:35 PM	0	66	4	0	0	65	6	0	15	2	14	0	1	0	0	0	173	0	0	0	1
4:40 PM	2	66	2	0	0	37	3	0	14	1	11	0	0	0	0	0	136	0	0	0	0
4:45 PM	4	90	2	0	1	56	4	0	6	1	7	0	2	1	0	0	174	0	0	0	0
4:50 PM	3	67	0	0	1	54	4	0	14	0	11	0	2	0	1	0	157	0	1	0	0
4:55 PM	0	74	2	0	1	52	5	0	9	0	7	0	3	1	0	0	154	0	1	0	0
5:00 PM	2	82	6	0	0	53	1	1	15	4	12	0	2	2	2	0	181	0	0	0	0
5:05 PM	1	69	4	0	0	42	7	0	18	4	13	0	0	0	0	0	158	0	0	0	0
5:10 PM	1	83	8	0	0	28	1	0	24	4	13	0	5	0	1	0	168	0	0	0	0
5:15 PM	4	93	1	0	1	64	4	0	28	2	7	0	2	0	1	0	207	1	1	1	0
5:20 PM	3	123	4	0	2	43	4	0	17	0	11	0	1	0	0	0	208	0	0	0	2
5:25 PM	3	90	5	1	0	47	6	0	36	3	25	0	1	0	1	0	217	0	0	0	0
5:30 PM	0	65	7	0	2	56	6	0	26	2	14	0	1	0	1	0	180	0	0	1	0
5:35 PM	2	83	1	0	0	58	8	0	33	9	12	0	4	2	0	0	212	0	0	0	0
5:40 PM	1	52	1	1	1	52	6	0	19	3	13	0	2	0	0	0	150	0	0	0	0
5:45 PM	2	76	6	0	1	61	11	0	19	5	5	0	5	1	3	0	195	1	0	0	0
5:50 PM	1	64	11	0	3	58	12	0	18	0	3	0	0	0	0	0	170	0	0	1	0
5:55 PM	5	83	5	0	1	34	6	0	25	0	7	0	1	0	0	0	167	1	0	0	0
Total Survey	51	1,814	88	5	17	1,161	137	2	424	46	244	0	48	10	13	0	4,053	4	4	4	3

15-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound NW Cornelius Pass Rd L	T	R	Bikes	Southbound NW Cornelius Pass Rd L	T	R	Bikes	Eastbound NW Jacobson Rd L	T	R	Bikes	Westbound NW Jacobson Rd L	T	R	Bikes	Interval Total	Pedestrians Crosswalk North	South	East	West
4:00 PM	6	205	6	1	1	122	22	0	29	3	17	0	10	0	1	0	422	1	0	0	0
4:15 PM	7	217	8	0	1	130	17	1	45	3	28	0	4	3	2	0	465	0	1	1	0
4:30 PM	6	198	11	2	1	151	13	0	43	3	39	0	3	0	0	0	468	0	0	0	1
4:45 PM	7	231	4	0	3	162	13	0	29	1	25	0	7	2	1	0	485	0	2	0	0
5:00 PM	4	234	18	0	0	123	9	1	57	12	38	0	7	2	3	0	507	0	0	0	0
5:15 PM	10	306	10	1	3	154	14	0	81	5	43	0	4	0	2	0	632	1	1	1	2
5:30 PM	3	200	9	1	3	166	20	0	78	14	39	0	7	2	1	0	542	0	0	1	0
5:45 PM	8	223	22	0	5	153	29	0	62	5	15	0	6	1	3	0	532	2	0	1	0
Total Survey	51	1,814	88	5	17	1,161	137	2	424	46	244	0	48	10	13	0	4,053	4	4	4	3

Peak Hour Summary
5:00 PM to 6:00 PM

By Approach	Northbound NW Cornelius Pass Rd In	Out	Total	Bikes	Southbound NW Cornelius Pass Rd In	Out	Total	Bikes	Eastbound NW Jacobson Rd In	Out	Total	Bikes	Westbound NW Jacobson Rd In	Out	Total	Bikes	Total
Volume	1,047	755	1,802	2	679	1,250	1,929	1	449	102	551	0	38	106	144	0	2,213
%HV	4.3%				5.2%				1.6%				0.0%				3.9%
PHF	0.80				0.83				0.70				0.56				0.88

Pedestrians Crosswalk North	South	East	West
3	1	3	2

By Movement	Northbound NW Cornelius Pass Rd L	T	R	Total	Southbound NW Cornelius Pass Rd L	T	R	Total	Eastbound NW Jacobson Rd L	T	R	Total	Westbound NW Jacobson Rd L	T	R	Total	Total
Volume	25	963	59	1,047	11	596	72	679	278	36	135	449	24	5	9	38	2,213
%HV	16.0%	4.0%	3.4%	4.3%	0.0%	5.4%	4.2%	5.2%	1.4%	0.0%	2.2%	1.6%	0.0%	0.0%	0.0%	0.0%	3.9%
PHF	0.63	0.79	0.67	0.80	0.55	0.87	0.62	0.83	0.73	0.53	0.66	0.70	0.55	0.42	0.75	0.56	0.88

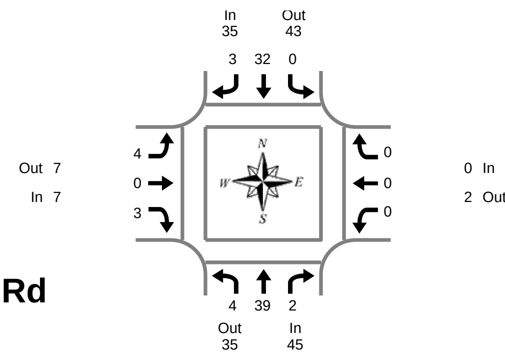
Rolling Hour Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound NW Cornelius Pass Rd L	T	R	Bikes	Southbound NW Cornelius Pass Rd L	T	R	Bikes	Eastbound NW Jacobson Rd L	T	R	Bikes	Westbound NW Jacobson Rd L	T	R	Bikes	Interval Total	Pedestrians Crosswalk North	South	East	West
4:00 PM	26	851	29	3	6	565	65	1	146	10	109	0	24	5	4	0	1,840	1	3	1	1
4:15 PM	24	880	41	2	5	566	52	2	174	19	130	0	21	7	6	0	1,925	0	3	1	1
4:30 PM	27	969	43	3	7	590	49	1	210	21	145	0	21	4	6	0	2,092	1	3	1	3
4:45 PM	24	971	41	2	9	605	56	1	245	32	145	0	25	6	7	0	2,166	1	3	2	2
5:00 PM	25	963	59	2	11	596	72	1	278	36	135	0	24	5	9	0	2,213	3	1	3	2

Heavy Vehicle Summary

All Traffic Data Services Inc.

Clay Carney
(503) 833-2740



Peak Hour Summary
5:00 PM to 6:00 PM

NW Cornelius Pass Rd & NW Jacobson Rd

Wednesday, March 21, 2007
4:00 PM to 6:00 PM

Heavy Vehicle 5-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound NW Cornelius Pass Rd				Southbound NW Cornelius Pass Rd				Eastbound NW Jacobson Rd				Westbound NW Jacobson Rd				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
4:00 PM	0	6	0	6	0	3	0	3	0	1	1	2	0	0	0	0	11
4:05 PM	1	6	0	7	0	5	0	5	0	0	0	0	0	0	0	0	12
4:10 PM	1	8	1	10	0	5	0	5	0	0	0	0	0	0	0	0	15
4:15 PM	0	7	0	7	0	2	0	2	2	0	0	2	1	0	0	1	12
4:20 PM	1	3	0	4	0	4	0	4	0	0	0	0	0	0	0	0	8
4:25 PM	0	6	0	6	0	6	0	6	0	0	0	0	0	0	0	0	12
4:30 PM	0	6	0	6	0	8	0	8	0	0	0	0	0	0	0	0	14
4:35 PM	0	7	0	7	0	8	0	8	1	0	0	1	0	0	0	0	16
4:40 PM	0	6	0	6	0	2	0	2	0	0	2	2	0	0	0	0	10
4:45 PM	0	5	0	5	0	3	0	3	0	0	0	0	0	0	0	0	8
4:50 PM	2	2	0	4	0	8	0	8	2	0	2	4	0	0	0	0	16
4:55 PM	0	5	1	6	0	4	0	4	1	0	0	1	0	0	0	0	11
5:00 PM	0	4	1	5	0	2	0	2	0	0	0	0	0	0	0	0	7
5:05 PM	0	2	1	3	0	3	1	4	0	0	2	2	0	0	0	0	9
5:10 PM	0	10	0	10	0	1	0	1	0	0	0	0	0	0	0	0	11
5:15 PM	1	2	0	3	0	3	0	3	0	0	0	0	0	0	0	0	6
5:20 PM	0	4	0	4	0	0	0	0	0	0	0	0	0	0	0	0	4
5:25 PM	0	3	0	3	0	8	0	8	0	0	0	0	0	0	0	0	11
5:30 PM	0	2	0	2	0	5	0	5	0	0	0	0	0	0	0	0	7
5:35 PM	1	2	0	3	0	4	1	5	1	0	0	1	0	0	0	0	9
5:40 PM	1	4	0	5	0	2	0	2	1	0	0	1	0	0	0	0	8
5:45 PM	0	4	0	4	0	3	1	4	0	0	1	1	0	0	0	0	9
5:50 PM	0	1	0	1	0	1	0	1	1	0	0	1	0	0	0	0	3
5:55 PM	1	1	0	2	0	0	0	0	1	0	0	1	0	0	0	0	3
Total Survey	9	106	4	119	0	90	3	93	10	1	8	19	1	0	0	1	232

Heavy Vehicle 15-Minute Interval Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound NW Cornelius Pass Rd				Southbound NW Cornelius Pass Rd				Eastbound NW Jacobson Rd				Westbound NW Jacobson Rd				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
4:00 PM	2	20	1	23	0	13	0	13	0	1	1	2	0	0	0	0	38
4:15 PM	1	16	0	17	0	12	0	12	2	0	0	2	1	0	0	1	32
4:30 PM	0	19	0	19	0	18	0	18	1	0	2	3	0	0	0	0	40
4:45 PM	2	12	1	15	0	15	0	15	3	0	2	5	0	0	0	0	35
5:00 PM	0	16	2	18	0	6	1	7	0	0	2	2	0	0	0	0	27
5:15 PM	1	9	0	10	0	11	0	11	0	0	0	0	0	0	0	0	21
5:30 PM	2	8	0	10	0	11	1	12	2	0	0	2	0	0	0	0	24
5:45 PM	1	6	0	7	0	4	1	5	2	0	1	3	0	0	0	0	15
Total Survey	9	106	4	119	0	90	3	93	10	1	8	19	1	0	0	1	232

Heavy Vehicle Peak Hour Summary
5:00 PM to 6:00 PM

By Approach	Northbound NW Cornelius Pass Rd			Southbound NW Cornelius Pass Rd			Eastbound NW Jacobson Rd			Westbound NW Jacobson Rd			Total
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	
Volume	45	35	80	35	43	78	7	7	14	0	2	2	87
PHF	0.63			0.49			0.58			0.00			0.81

By Movement	Northbound NW Cornelius Pass Rd				Southbound NW Cornelius Pass Rd				Eastbound NW Jacobson Rd				Westbound NW Jacobson Rd				Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
Volume	4	39	2	45	0	32	3	35	4	0	3	7	0	0	0	0	87
PHF	0.50	0.61	0.25	0.63	0.00	0.47	0.38	0.49	0.50	0.00	0.38	0.58	0.00	0.00	0.00	0.00	0.81

Heavy Vehicle Rolling Hour Summary
4:00 PM to 6:00 PM

Interval Start Time	Northbound NW Cornelius Pass Rd				Southbound NW Cornelius Pass Rd				Eastbound NW Jacobson Rd				Westbound NW Jacobson Rd				Interval Total
	L	T	R	Total	L	T	R	Total	L	T	R	Total	L	T	R	Total	
4:00 PM	5	67	2	74	0	58	0	58	6	1	5	12	1	0	0	1	145
4:15 PM	3	63	3	69	0	51	1	52	6	0	6	12	1	0	0	1	134
4:30 PM	3	56	3	62	0	50	1	51	4	0	6	10	0	0	0	0	123
4:45 PM	5	45	3	53	0	43	2	45	5	0	4	9	0	0	0	0	107
5:00 PM	4	39	2	45	0	32	3	35	4	0	3	7	0	0	0	0	87

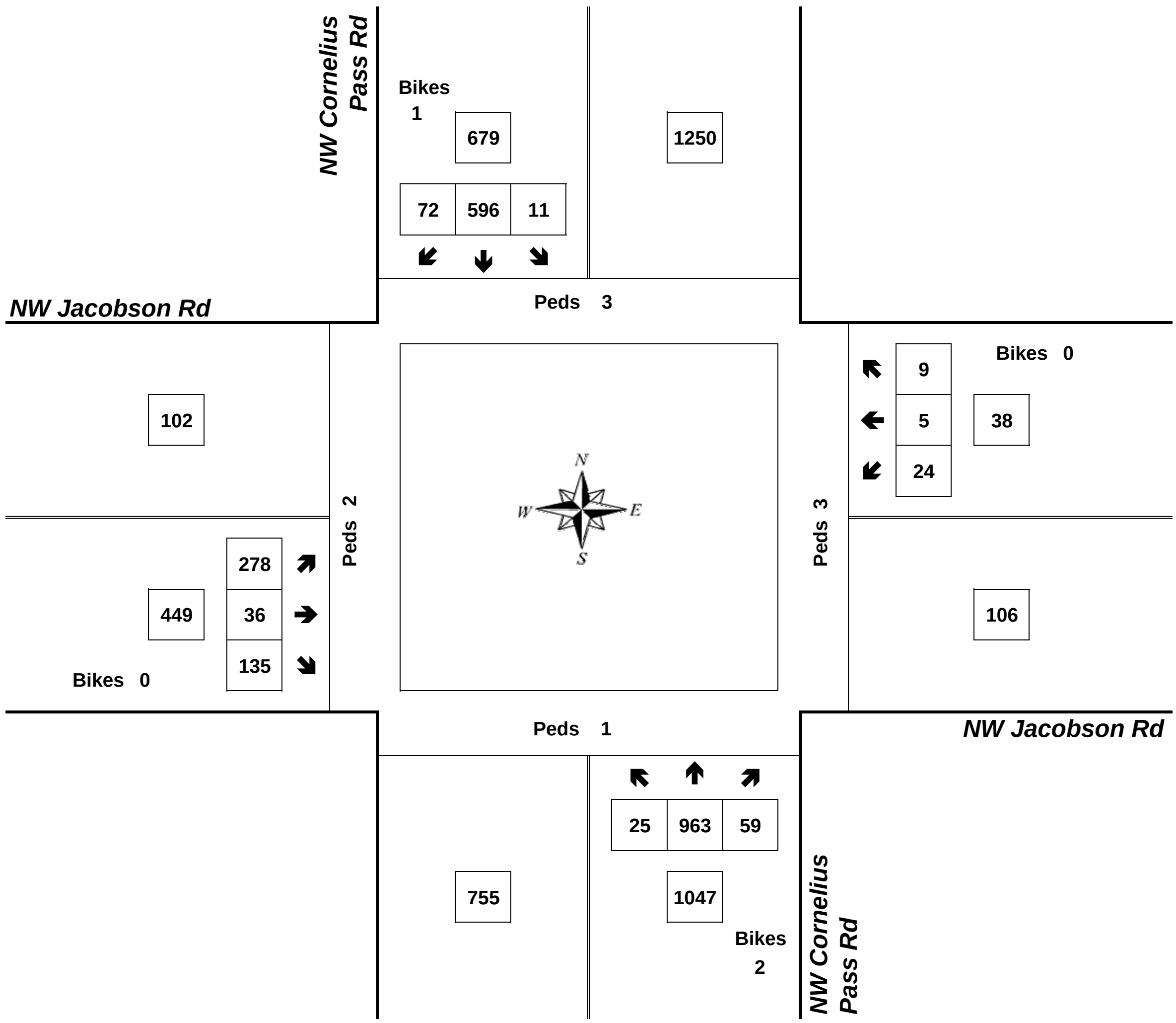
Peak Hour Summary

All Traffic Data Services Inc.

Clay Carney
(503) 833-2740

NW Cornelius Pass Rd & NW Jacobson Rd

5:00 PM to 6:00 PM
Wednesday, March 21, 2007



Approach	PHF	HV%	Volume
EB	0.70	1.6%	449
WB	0.56	0.0%	38
NB	0.80	4.3%	1,047
SB	0.83	5.2%	679
Intersection	0.88	3.9%	2,213

Count Period: 4:00 PM to 6:00 PM

Helvetia Conceptual Design Plan
PM Peak Hour
Existing Conditions (2007)

Scenario Report

Scenario:	Existing PM Peak
Command:	Default Command
Volume:	Default Volume
Geometry:	Default Geometry
Impact Fee:	Default Impact Fee
Trip Generation:	Default Trip Generation
Trip Distribution:	Default Trip Distribution
Paths:	Default Path
Routes:	Default Route
Configuration:	Default Configuration

Helvetia Conceptual Design Plan
PM Peak Hour
Existing Conditions (2007)

Impact Analysis Report
Level Of Service

Intersection	Base			Future			Change
	LOS	Del/ Veh	V/ C	LOS	Del/ Veh	V/ C	in
# 6 NW SHute Rd/NW Evergreen Pkwy	D	35.0	0.729	D	35.0	0.729	+ 0.000 D/V
# 12 NW Helvetia Rd/NW West Union R	A	9.8	0.000	A	9.8	0.000	+ 0.000 D/V
# 13 NW Helvetia Rd/NW West Union R	C	17.9	0.000	C	17.9	0.000	+ 0.000 D/V
# 14 NW Helvetia Rd/NW West Union R	A	9.3	0.000	A	9.3	0.000	+ 0.000 D/V
# 15 NW Helvetia Rd/NW Jacobson Rd	E	48.2	0.000	E	48.2	0.000	+ 0.000 D/V
# 16 NW Shute Rd/Hwy 26 WB Ramp	C	20.4	0.716	C	20.4	0.716	+ 0.000 D/V
# 17 NW Shute Rd/Hwy 26 EB Ramp	A	7.7	0.643	A	7.7	0.643	+ 0.000 D/V
# 18 NW Shute/NW Huffman St	D	34.5	0.000	D	34.5	0.000	+ 0.000 D/V
# 22 NW Jacobson Rd/NW Century Blvd	B	12.6	0.000	B	12.6	0.000	+ 0.000 D/V
# 23 NW Cornelius Pass Rd/NW Jacobs	B	17.9	0.669	B	17.9	0.669	+ 0.000 D/V

```
---------------------------------------------------------------------------
                      Helvetia Conceptual Design Plan
                               PM Peak Hour
                        Existing Conditions (2007)
---------------------------------------------------------------------------
                    Level Of Service Computation Report
           2000 HCM Operations Method (Base Volume Alternative)
***************************************************************************
Intersection #6 NW SHute Rd/NW Evergreen Pkwy
***************************************************************************
Cycle (sec):        110            Critical Vol./Cap.(X):         0.729
Loss Time (sec):      16 (Y+R=4.0 sec) Average Delay (sec/veh):    35.0
Optimal Cycle:      75             Level Of Service:                 D
***************************************************************************
Approach:     North Bound      South Bound      East Bound       West Bound
Movement:    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Protected        Protected        Protected        Protected
Rights:          Include           Ovl            Include          Include
Min. Green:    0    0    0     0    0    0     0    0    0     0    0    0
Lanes:       1  0  2  0  1    1  0  2  0  2    2  0  1  1  0    2  0  2  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:     83  877   104    26  671   260   655  526    91   186  466   114
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:  83  877   104    26  671   260   655  526    91   186  466   114
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.92 0.92  0.92  0.92 0.92  0.92  0.92 0.92  0.92  0.92 0.92  0.92
PHF Volume:   90  953   113    28  729   283   712  572    99   202  507   124
Reduct Vol:    0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:  90  953   113    28  729   283   712  572    99   202  507   124
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:  90  953   113    28  729   283   712  572    99   202  507   124
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  0.95 0.95  0.85  0.95 0.95  0.75  0.92 0.93  0.93  0.92 0.95  0.85
Lanes:       1.00 2.00  1.00  1.00 2.00  2.00  2.00 1.71  0.29  2.00 2.00  1.00
Final Sat.:  1805 3610  1615  1805 3610  2842  3502 3010   521  3502 3610  1615
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.05 0.26  0.07  0.02 0.20  0.10  0.20 0.19  0.19  0.06 0.14  0.08
Crit Moves:       ****        ****             ****                  ****
Green/Cycle: 0.08 0.36  0.36  0.02 0.31  0.59  0.28 0.36  0.36  0.11 0.19  0.19
Volume/Cap:  0.66 0.73  0.19  0.73 0.66  0.17  0.73 0.53  0.53  0.53 0.73  0.40
Delay/Veh:   60.5 32.5  24.2 104.7 34.5  10.5  38.7 28.1  28.1  47.6 45.7  39.7
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:  60.5 32.5  24.2 104.7 34.5  10.5  38.7 28.1  28.1  47.6 45.7  39.7
LOS by Move:   E    C     C     F    C     B     D    C     C     D    D     D
HCM2kAvgQ:     4   16     3     2   12     2    13   10    10     4   10     4
***************************************************************************
Note: Queue reported is the number of cars per lane.
***************************************************************************
```



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---------------------------------------------------------------------------
                      Helvetia Conceptual Design Plan
                               PM Peak Hour
                        Existing Conditions (2007)
---------------------------------------------------------------------------
                    Level Of Service Computation Report
          2000 HCM Unsignalized Method (Base Volume Alternative)
***************************************************************************
Intersection #12 NW Helvetia Rd/NW West Union Rd North
***************************************************************************
Average Delay (sec/veh):      0.5      Worst Case Level Of Service: A[  9.8]
***************************************************************************
Street Name:                                              West Union spur
Approach:     North Bound      South Bound      East Bound       West Bound
Movement:    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:      Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Rights:          Include          Include          Include          Include
Lanes:       0  0  1  0  0    0  0  0  1  0    0  0  1! 0  0    0  0  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      0  139     0     0   75     9    11    0     1     0    0     0
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   0  139     0     0   75     9    11    0     1     0    0     0
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.89 0.89  0.89  0.89 0.89  0.89  0.89 0.89  0.89  0.89 0.89  0.89
PHF Volume:    0  156     0     0   84    10    12    0     1     0    0     0
Reduct Vol:    0    0     0     0    0     0     0    0     0     0    0     0
FinalVolume:   0  156     0     0   84    10    12    0     1     0    0     0
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:xxxxx xxxx xxxxx xxxxx xxxx xxxxx   6.4  6.5   6.2 xxxxx xxxx xxxxx
FollowUpTim:xxxxx xxxx xxxxx xxxxx xxxx xxxxx   3.5  4.0   3.3 xxxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: xxxx xxxx xxxxx  xxxx xxxx xxxxx   246  246    89  xxxx xxxx xxxxx
Potent Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx   747  660   974  xxxx xxxx xxxxx
Move Cap.:   xxxx xxxx xxxxx  xxxx xxxx xxxxx   747  660   974  xxxx xxxx xxxxx
Volume/Cap:  xxxx xxxx  xxxx  xxxx xxxx  xxxx  0.02 0.00  0.00  xxxx xxxx  xxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
2Way95thQ:   xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Control Del:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:   *    *     *     *    *     *     *    *     *     *    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx  762 xxxxx  xxxx xxxx xxxxx
SharedQueue:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx  0.1 xxxxx xxxxx xxxx xxxxx
Shrd ConDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx  9.8 xxxxx xxxxx xxxx xxxxx
Shared LOS:    *    *     *     *    *     *     *    A     *     *    *     *
ApproachDel:     xxxxxx           xxxxxx             9.8            xxxxxx
ApproachLOS:        *                *                A                *
***************************************************************************
Note: Queue reported is the number of cars per lane.
***************************************************************************
```

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---------------------------------------------------------------------------
                     Helvetia Conceptual Design Plan
                              PM Peak Hour
                       Existing Conditions (2007)
---------------------------------------------------------------------------
                   Level Of Service Computation Report
          2000 HCM Unsignalized Method (Base Volume Alternative)
***************************************************************************
Intersection #13 NW Helvetia Rd/NW West Union Rd
***************************************************************************
Average Delay (sec/veh):      8.5       Worst Case Level Of Service: C[ 17.9]
***************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:    L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Stop Sign        Stop Sign       Uncontrolled     Uncontrolled
Rights:          Include          Include          Include          Include
Lanes:       0  0  1! 0  0   0  1  0  0  0   0  0  0  1  0   0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      35  103     2    11   69     0     0   63    34   107   98    15
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   35  103     2    11   69     0     0   63    34   107   98    15
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.87 0.87  0.87  0.87 0.87  0.87  0.87 0.87  0.87  0.87 0.87  0.87
PHF Volume:    40  118     2    13   79     0     0   72    39   123  113    17
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
FinalVolume:   40  118     2    13   79     0     0   72    39   123  113    17
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:  7.1  6.5   6.2   7.1  6.5 xxxxx xxxxx xxxx xxxxx   4.1 xxxx xxxxx
FollowUpTim:  3.5  4.0   3.3   3.5  4.0 xxxxx xxxxx xxxx xxxxx   2.2 xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol:  499  468    92   520  479 xxxxx  xxxx xxxx xxxxx   111 xxxx xxxxx
Potent Cap.:  485  496   971   470  489 xxxxx  xxxx xxxx xxxxx  1491 xxxx xxxxx
Move Cap.:    391  452   971   350  446 xxxxx  xxxx xxxx xxxxx  1491 xxxx xxxxx
Volume/Cap:  0.10 0.26  0.00  0.04 0.18  xxxx  xxxx xxxx  xxxx  0.08 xxxx  xxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
2Way95thQ:   xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx   0.3 xxxx xxxxx
Control Del:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx   7.6 xxxx xxxxx
LOS by Move:    *    *     *     *    *     *     *    *     *     A    *     *
Movement:     LT - LTR - RT   LT - LTR - RT   LT - LTR - RT   LT - LTR - RT
Shared Cap.: xxxx  438 xxxxx   430 xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
SharedQueue:xxxxx  1.7 xxxxx   0.8 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shrd ConDel:xxxxx 17.9 xxxxx  15.7 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS:     *    C     *     C    *     *     *    *     *     *    *     *
ApproachDel:        17.9             15.7            xxxxxx           xxxxxx
ApproachLOS:          C                C                *                *
***************************************************************************
Note: Queue reported is the number of cars per lane.
***************************************************************************
```



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---------------------------------------------------------------------------
                     Helvetia Conceptual Design Plan
                              PM Peak Hour
                       Existing Conditions (2007)
---------------------------------------------------------------------------
                   Level Of Service Computation Report
          2000 HCM Unsignalized Method (Base Volume Alternative)
***************************************************************************
Intersection #14 NW Helvetia Rd/NW West Union Rd South
***************************************************************************
Average Delay (sec/veh):      0.0       Worst Case Level Of Service: A[  9.3]
***************************************************************************
Street Name:                                   driveway - West Union spur
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:    L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:      Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Rights:          Include          Include          Include          Include
Lanes:       0  0  0  1  0   0  0  1  0  0   0  0  0  0  1   0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       0  167   174     0  183     0     0    0     1     0    0     0
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    0  167   174     0  183     0     0    0     1     0    0     0
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.87 0.87  0.87  0.87 0.87  0.87  0.87 0.87  0.87  0.87 0.87  0.87
PHF Volume:     0  192   200     0  210     0     0    0     1     0    0     0
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
FinalVolume:    0  192   200     0  210     0     0    0     1     0    0     0
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx   6.2   7.1  6.5   6.2
FollowUpTim:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx   3.3   3.5  4.0   3.3
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx   210   503  502   292
Potent Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx   835   482  474   752
Move Cap.:   xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx   835   482  474   752
Volume/Cap:  xxxx xxxx  xxxx  xxxx xxxx  xxxx  xxxx xxxx  0.00  0.00 0.00  0.00
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
2Way95thQ:   xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx   0.0  xxxx xxxx xxxxx
Control Del:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx   9.3 xxxxx xxxx xxxxx
LOS by Move:    *    *     *     *    *     *     *    *     A     *    *     *
Movement:     LT - LTR - RT   LT - LTR - RT   LT - LTR - RT   LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx    0 xxxxx
SharedQueue:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shrd ConDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS:     *    *     *     *    *     *     *    *     *     *    *     *
ApproachDel:      xxxxxx           xxxxxx              9.3           xxxxxx
ApproachLOS:         *                *                A                *
***************************************************************************
Note: Queue reported is the number of cars per lane.
***************************************************************************
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-------------------------------------------------------------------------------
                       Helvetia Conceptual Design Plan
                                PM Peak Hour
                         Existing Conditions (2007)
-------------------------------------------------------------------------------
                     Level Of Service Computation Report
            2000 HCM Unsignalized Method (Base Volume Alternative)
*******************************************************************************
Intersection #15 NW Helvetia Rd/NW Jacobson Rd
*******************************************************************************
Average Delay (sec/veh):      8.3       Worst Case Level Of Service: E[ 48.2]
*******************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:      Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Rights:          Include          Include          Include          Include
Lanes:       0  0  1! 0  0    0  0  1! 0  0    0  0  1! 0  0    0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       6  358   382     9  168     2     3    2     4   183    1     3
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    6  358   382     9  168     2     3    2     4   183    1     3
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.89 0.89  0.89  0.89 0.89  0.89  0.89 0.89  0.89  0.89 0.89  0.89
PHF Volume:     7  402   429    10  189     2     3    2     4   206    1     3
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
FinalVolume:    7  402   429    10  189     2     3    2     4   206    1     3
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:  4.1 xxxx xxxxx   4.1 xxxx xxxxx   7.1  6.5   6.2   7.1  6.5   6.2
FollowUpTim:  2.2 xxxx xxxxx   2.2 xxxx xxxxx   3.5  4.0   3.3   3.5  4.0   3.3
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol:  191 xxxx xxxxx   831 xxxx xxxxx   843 1055   190   844  842   617
Potent Cap.: 1395 xxxx xxxxx   810 xxxx xxxxx   286  227   857   285  303   494
Move Cap.:   1395 xxxx xxxxx   810 xxxx xxxxx   279  224   857   278  298   494
Volume/Cap:  0.00 xxxx  xxxx  0.01 xxxx  xxxx  0.01 0.01  0.01  0.74 0.00  0.01
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
2Way95thQ:    0.0 xxxx xxxxx   0.0 xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Control Del:  7.6 xxxx xxxxx   9.5 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:    A    *     *     A    *     *     *    *     *     *    *     *
Movement:      LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx  370 xxxxx  xxxx  280 xxxxx
SharedQueue:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx  0.1 xxxxx xxxxx  5.5 xxxxx
Shrd ConDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx 15.0 xxxxx xxxxx 48.2 xxxxx
Shared LOS:     *    *     *     *    *     *     *    C     *     *    E     *
ApproachDel:     xxxxxx           xxxxxx            15.0             48.2
ApproachLOS:        *                *                C                E
*******************************************************************************
Note: Queue reported is the number of cars per lane.
*******************************************************************************
```



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-------------------------------------------------------------------------------
                       Helvetia Conceptual Design Plan
                                PM Peak Hour
                         Existing Conditions (2007)
-------------------------------------------------------------------------------
                     Level Of Service Computation Report
             2000 HCM Operations Method (Base Volume Alternative)
*******************************************************************************
Intersection #16 NW Shute Rd/Hwy 26 WB Ramp
*******************************************************************************
Cycle (sec):         70              Critical Vol./Cap.(X):         0.716
Loss Time (sec):     12 (Y+R=4.0 sec) Average Delay (sec/veh):       20.4
Optimal Cycle:       56              Level Of Service:                 C
*******************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Protected        Protected        Protected        Protected
Rights:          Include          Include          Include          Include
Min. Green:     0    0     0     0    0     0     0    0     0     0    0     0
Lanes:       1  0  1  0  0    0  0  1  1  0    0  0  0  0  0    1  1  0  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:     199  615     0     0  222    69     0    0     0   677    0    59
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:  199  615     0     0  222    69     0    0     0   677    0    59
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.89 0.89  0.89  0.89 0.89  0.89  0.89 0.89  0.89  0.89 0.89  0.89
PHF Volume:   224  691     0     0  249    78     0    0     0   761    0    66
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:  224  691     0     0  249    78     0    0     0   761    0    66
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:  224  691     0     0  249    78     0    0     0   761    0    66
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  0.92 0.97  1.00  1.00 0.88  0.88  1.00 1.00  1.00  0.92 1.00  0.82
Lanes:       1.00 1.00  0.00  0.00 1.53  0.47  0.00 0.00  0.00  2.00 0.00  1.00
Final Sat.:  1753 1845     0     0 2554   794     0    0     0  3480    0  1554
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.13 0.37  0.00  0.00 0.10  0.10  0.00 0.00  0.00  0.22 0.00  0.04
Crit Moves:       ****        ****                               ****
Green/Cycle: 0.30 0.52  0.00  0.00 0.23  0.23  0.00 0.00  0.00  0.31 0.00  0.31
Volume/Cap:  0.43 0.72  0.00  0.00 0.43  0.43  0.00 0.00  0.00  0.72 0.00  0.14
Delay/Veh:   20.4 15.3   0.0   0.0 23.6  23.6   0.0  0.0   0.0  24.0  0.0  17.8
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:  20.4 15.3   0.0   0.0 23.6  23.6   0.0  0.0   0.0  24.0  0.0  17.8
LOS by Move:    C    B     A     A    C     C     A    A     A     C    A     B
HCM2kAvgQ:      4   13     0     0    4     4     0    0     0     9    0     1
*******************************************************************************
Note: Queue reported is the number of cars per lane.
*******************************************************************************
```

Helvetia Conceptual Design Plan
PM Peak Hour
Existing Conditions (2007)

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

Intersection #17 NW Shute Rd/Hwy 26 EB Ramp

Cycle (sec):	70	Critical Vol./Cap.(X):	0.643
Loss Time (sec):	12 (Y+R=4.0 sec)	Average Delay (sec/veh):	7.7
Optimal Cycle:	49	Level Of Service:	A

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Ignore			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0 0 1 0 1			1 0 2 0 0			0 1 0 0 1			0 0 0 0 0		
Volume Module:												
Base Vol:	0	808	960	22	844	0	38	1	83	0	0	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	808	960	22	844	0	38	1	83	0	0	0
User Adj:	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.93	0.93	0.00	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
PHF Volume:	0	869	0	24	908	0	41	1	89	0	0	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	869	0	24	908	0	41	1	89	0	0	0
PCE Adj:	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	0	869	0	24	908	0	41	1	89	0	0	0
Saturation Flow Module:												
Sat/Lane:	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adjustment:	1.00	0.99	1.00	0.92	0.92	1.00	0.92	0.92	0.82	1.00	1.00	1.00
Lanes:	0.00	1.00	1.00	1.00	2.00	0.00	0.97	0.03	1.00	0.00	0.00	0.00
Final Sat.:	0	1881	1900	1753	3505	0	1697	45	1554	0	0	0
Capacity Analysis Module:												
Vol/Sat:	0.00	0.46	0.00	0.01	0.26	0.00	0.02	0.02	0.06	0.00	0.00	0.00
Crit Moves:		****		****					****			
Green/Cycle:	0.00	0.72	0.00	0.02	0.74	0.00	0.09	0.09	0.09	0.00	0.00	0.00
Volume/Cap:	0.00	0.64	0.00	0.64	0.35	0.00	0.27	0.27	0.64	0.00	0.00	0.00
Delay/Veh:	0.0	6.2	0.0	66.9	3.3	0.0	30.7	30.7	40.7	0.0	0.0	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	6.2	0.0	66.9	3.3	0.0	30.7	30.7	40.7	0.0	0.0	0.0
LOS by Move:	A	A	A	E	A	A	C	C	D	A	A	A
HCM2kAvgQ:	0	11	0	2	4	0	1	1	3	0	0	0

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

Helvetia Conceptual Design Plan
PM Peak Hour
Existing Conditions (2007)

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

Intersection #18 NW Shute/NW Huffman St

Average Delay (sec/veh): 1.3 Worst Case Level Of Service: D[34.5]

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Uncontrolled			Uncontrolled			Stop Sign			Stop Sign		
Rights:	Include			Include			Include			Include		
Lanes:	0 0 1 1 0			1 0 2 0 0			0 0 0 0 0			1 0 0 0 1		
Volume Module:												
Base Vol:	0	1666	6	10	924	0	0	0	0	6	0	88
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	1666	6	10	924	0	0	0	0	6	0	88
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
PHF Volume:	0	1851	7	11	1027	0	0	0	0	7	0	98
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
FinalVolume:	0	1851	7	11	1027	0	0	0	0	7	0	98
Critical Gap Module:												
Critical Gp:	xxxxx	xxxx	xxxxx	4.1	xxxx	xxxxx	xxxxx	xxxx	xxxxx	6.8	xxxx	6.9
FollowUpTim:	xxxxx	xxxx	xxxxx	2.2	xxxx	xxxxx	xxxxx	xxxx	xxxxx	3.5	xxxx	3.3
Capacity Module:												
Cnflict Vol:	xxxx	xxxx	xxxxx	1858	xxxx	xxxxx	xxxx	xxxx	xxxxx	2390	xxxx	929
Potent Cap.:	xxxx	xxxx	xxxxx	330	xxxx	xxxxx	xxxx	xxxx	xxxxx	29	xxxx	273
Move Cap.:	xxxx	xxxx	xxxxx	330	xxxx	xxxxx	xxxx	xxxx	xxxxx	28	xxxx	273
Volume/Cap:	xxxx	xxxx	xxxx	0.03	xxxx	xxxx	xxxx	xxxx	xxxx	0.24	xxxx	0.36
Level Of Service Module:												
2Way95thQ:	xxxx	xxxx	xxxxx	0.1	xxxx	xxxxx	xxxx	xxxx	xxxxx	0.7	xxxx	1.6
Control Del:	xxxxx	xxxx	xxxxx	16.3	xxxx	xxxxx	xxxxx	xxxx	xxxxx	168.0	xxxx	25.3
LOS by Move:	*	*	*	C	*	*	*	*	*	F	*	D
Movement:	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT
Shared Cap.:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
SharedQueue:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shrd ConDel:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shared LOS:	*	*	*	*	*	*	*	*	*	*	*	*
ApproachDel:	xxxxxx			xxxxxx			xxxxxx			34.5		
ApproachLOS:	*			*			*			D		

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

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                        Helvetia Conceptual Design Plan
                                 PM Peak Hour
                          Existing Conditions (2007)
--------------------------------------------------------------------------------
                       Level Of Service Computation Report
            2000 HCM Unsignalized Method (Base Volume Alternative)
********************************************************************************
Intersection #22 NW Jacobson Rd/NW Century Blvd
********************************************************************************
Average Delay (sec/veh):       1.0      Worst Case Level Of Service: B[ 12.6]
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Stop Sign        Stop Sign       Uncontrolled     Uncontrolled
Rights:          Include          Include          Include          Include
Lanes:       1  0  0  0  1    0  0  0  0  0    0  0  0  1  0    0  1  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      32    0     6     0    0     0     0  347     9     1  115     0
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   32    0     6     0    0     0     0  347     9     1  115     0
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.83 0.83  0.83  0.83 0.83  0.83  0.83 0.83  0.83  0.83 0.83  0.83
PHF Volume:    39    0     7     0    0     0     0  418    11     1  139     0
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
FinalVolume:   39    0     7     0    0     0     0  418    11     1  139     0
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:  6.4 xxxx   6.2 xxxxx xxxx xxxxx xxxxx xxxx xxxxx   4.1 xxxx xxxxx
FollowUpTim:  3.5 xxxx   3.3 xxxxx xxxx xxxxx xxxxx xxxx xxxxx   2.2 xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol:  564 xxxx   423  xxxx xxxx xxxxx  xxxx xxxx xxxxx   429 xxxx xxxxx
Potent Cap.:  490 xxxx   635  xxxx xxxx xxxxx  xxxx xxxx xxxxx  1141 xxxx xxxxx
Move Cap.:    490 xxxx   635  xxxx xxxx xxxxx  xxxx xxxx xxxxx  1141 xxxx xxxxx
Volume/Cap:  0.08 xxxx  0.01  xxxx xxxx  xxxx  xxxx xxxx  xxxx  0.00 xxxx  xxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
2Way95thQ:    0.3 xxxx   0.0  xxxx xxxx xxxxx  xxxx xxxx xxxxx   0.0 xxxx xxxxx
Control Del: 13.0 xxxx  10.7 xxxxx xxxx xxxxx xxxxx xxxx xxxxx   8.2 xxxx xxxxx
LOS by Move:    B    *     B     *    *     *     *    *     *     A    *     *
Movement:     LT - LTR - RT   LT - LTR - RT   LT - LTR - RT   LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
SharedQueue:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx   0.0 xxxx xxxxx
Shrd ConDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx   8.2 xxxx xxxxx
Shared LOS:     *    *     *     *    *     *     *    *     *     A    *     *
ApproachDel:       12.6           xxxxxx           xxxxxx           xxxxxx
ApproachLOS:         B               *                *                *
********************************************************************************
Note: Queue reported is the number of cars per lane.
********************************************************************************
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--------------------------------------------------------------------------------
                        Helvetia Conceptual Design Plan
                                 PM Peak Hour
                          Existing Conditions (2007)
--------------------------------------------------------------------------------
                       Level Of Service Computation Report
              2000 HCM Operations Method (Base Volume Alternative)
********************************************************************************
Intersection #23 NW Cornelius Pass Rd/NW Jacobson Rd
********************************************************************************
Cycle (sec):          70             Critical Vol./Cap.(X):         0.669
Loss Time (sec):      16 (Y+R=4.0 sec) Average Delay (sec/veh):      17.9
Optimal Cycle:        59             Level Of Service:                  B
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Protected        Protected        Protected        Protected
Rights:          Include          Include          Include          Include
Min. Green:    0    0     0     0    0     0     0    0     0     0    0     0
Lanes:       1  0  1  1  0    1  0  1  1  0    1  0  0  1  0    1  0  0  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      25  963    59    11  596    72   278   36   135    24    5     9
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   25  963    59    11  596    72   278   36   135    24    5     9
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.88 0.88  0.88  0.88 0.88  0.88  0.88 0.88  0.88  0.88 0.88  0.88
PHF Volume:    28 1094    67    13  677    82   316   41   153    27    6    10
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:   28 1094    67    13  677    82   316   41   153    27    6    10
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:   28 1094    67    13  677    82   316   41   153    27    6    10
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  0.95 0.94  0.94  0.95 0.93  0.93  0.95 0.88  0.88  0.95 0.90  0.90
Lanes:       1.00 1.88  0.12  1.00 1.78  0.22  1.00 0.21  0.79  1.00 0.36  0.64
Final Sat.:  1805 3371   207  1805 3169   383  1805  353  1323  1805  613  1104
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.02 0.32  0.32  0.01 0.21  0.21  0.18 0.12  0.12  0.02 0.01  0.01
Crit Moves:       ****        ****             ****                  ****
Green/Cycle: 0.03 0.49  0.49  0.01 0.46  0.46  0.26 0.24  0.24  0.03 0.01  0.01
Volume/Cap:  0.46 0.67  0.67  0.67 0.46  0.46  0.67 0.48  0.48  0.48 0.67  0.67
Delay/Veh:   38.6 14.7  14.7 100.5 13.1  13.1  26.8 23.5  23.5  39.4 89.1  89.1
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:  38.6 14.7  14.7 100.5 13.1  13.1  26.8 23.5  23.5  39.4 89.1  89.1
LOS by Move:    D    B     B     F    B     B     C    C     C     D    F     F
HCM2kAvgQ:      1   11    11     1    6     6     7    4     4     1    1     1
********************************************************************************
Note: Queue reported is the number of cars per lane.
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Appendix A

Existing Conditions Report

Appendix B

Metro Ordinance No. 04-1040B

BEFORE THE METRO COUNCIL

FOR THE PURPOSE OF AMENDING THE METRO URBAN GROWTH BOUNDARY, THE REGIONAL FRAMEWORK PLAN AND THE METRO CODE TO INCREASE THE CAPACITY OF THE BOUNDARY TO ACCOMMODATE GROWTH IN INDUSTRIAL EMPLOYMENT	)))))))	ORDINANCE NO. 04-1040B Introduced by the Metro Council

WHEREAS, by Ordinance No. 02-969B (For The Purpose Of Amending The Urban Growth Boundary, The Regional Framework Plan And The Metro Code In Order To Increase The Capacity Of The Boundary To Accommodate Population Growth To The Year 2022), the Council amended Title 4 (Industrial and Other Employment Areas) of the Urban Growth Management Functional Plan to increase the capacity of industrial land to accommodate industrial jobs; and

WHEREAS, the Metro Council adopted an Employment and Industrial Areas Map as part of Title 4 (Retail in Employment and Industrial Areas) in Ordinance No. 96-647C (For the Purpose of Adopting a Functional Plan for Early Implementation of the 2040 Growth Concept) on November 21, 1996; and

WHEREAS, the Council amended the Regional Framework Plan ("RFP") by Exhibit D to Ordinance No. 02-969B (For the Purpose of Amending the Metro Urban Growth Boundary, the Regional Framework Plan and the Metro Code in Order to Increase the Capacity of the Boundary to Accommodate Population Growth to the Year 2022), adopted on December 5, 2002, to establish a new 2040 Growth Concept design type entitled "Regionally Significant Industrial Area" ("RSIA") and to add Policies 1.4.1 and 1.4.2 to protect such areas by limiting conflicting uses; and

WHEREAS, by Exhibit F to Ordinance No. 02-969B the Council amended Title 4 (Industrial and Other Employment Areas) of the Urban Growth Management Functional Plan ("UGMFP") to implement Policies 1.4.1 and 1.4.2 of the RFP; and

WHEREAS, by Exhibit E of Ordinance No. 02-969B the Council adopted a "Generalized Map of Regionally Significant Industrial Areas" depicting certain Industrial Areas that lay within the UGB prior to its expansion as part of Task 2 of periodic review as RSIAs; and

WHEREAS, Title 4 calls upon the Council to delineate specific boundaries for RSIAs derived from the "Generalized Map of Regionally Significant Industrial Areas" after consultation with cities and counties; and

WHEREAS, by Ordinance No. 02-969B, the Council added capacity to the UGB but did not add sufficient capacity to accommodate the full need for land for industrial use; and

WHEREAS, the Metro Council submitted Ordinance No. 969B, in combination with other ordinances that increased the capacity of the UGB, to the Land Conservation and Development Commission (LCDC) as part of Metro's periodic review of the capacity of its UGB; and

WHEREAS, on July 7, 2003, LCDC issued its "Partial Approval and Remand Order 03-WKTASK-001524" that approved most of the Council's decisions, but returned the matter to the Council for completion or revision of three tasks: (1) provide complete data on the number, density and mix of housing types and determine the need for housing types over the next 20 years; (2) add capacity to the UGB for the unmet portion of the need for land for industrial use; and (3) either remove tax lots 1300, 1400 and 1500 in Study Area 62 from the UGB or justify their inclusion; and

WHEREAS, the Council completed its analysis of the number, density and mix of housing types and the need for housing over the planning period 2002-2022 and incorporated its conclusions in a revision to its Housing Needs Analysis; and

WHEREAS, the Council increased the capacity of the UGB both by adding land to the UGB and by revising the Regional Framework Plan and Title 4 of the UGMFP to meet the previously unmet portion of the need for land for industrial use; and

WHEREAS, a change in design type designation of a portion of Study Area 12 added to the UGB on December 5, 2002, by Ordinance No. 02-969B from residential to industrial will help the region accommodate the need for industrial use without reducing the region's residential capacity below the region's residential need; and

WHEREAS, the Council decided to remove tax lots 1300, 1400 and 1500 in Study Area 62 from the UGB; and

WHEREAS, the Council consulted its Metropolitan Policy Advisory Committee and the 24 cities and three counties of the metropolitan region and considered comments and suggestions prior to making this decision; and

WHEREAS, prior to making this decision, the Council sent individual mailed notification to more than 100,000 households in the region and held public hearings on Title 4 and the efficient use of industrial land on December 4 and 11, 2003, public workshops at six locations around the region in March, 2004, on possible amendments to the UGB, and public hearings on the entire matter on April 22 and 29, May 6, May 27, and June 10 and 24, 2004; now, therefore

THE METRO COUNCIL HEREBY ORDAINS AS FOLLOWS:

1. Policy 1.12 of the Regional Framework Plan is hereby amended, as indicated in Exhibit A, attached and incorporated into this ordinance, to guide the choice of farmland for addition to the UGB when no higher priority land is available or suitable.

2. Title 4 (Industrial and Other Employment Areas) of the Urban Growth Management Functional Plan is hereby amended, as indicated in Exhibit B, attached and incorporated into this ordinance, to improve implementation of Title 4 by cities and counties in the region.

3. The Employment and Industrial Areas Map is hereby amended, as shown in Exhibit C, attached and incorporated into this ordinance, to depict the boundaries of Regionally Significant Industrial Areas pursuant to Policy 1.4.1 of the Regional Framework Plan in order to ensure more efficient use of the areas for industries reliant upon the movement of freight and to protect the function and capacity of freight routes and connectors in the region.

4. The Revised Housing Needs Analysis, January 24, 2003, is hereby further revised, as indicated in Exhibit D, Addendum to Housing Needs Analysis, April 5, 2004, attached and incorporated into this ordinance, to comply with the first item in LCDC's "Partial Approval and Remand Order 03-WKTASK-001524."

5. The Metro UGB is hereby amended to include all or portions of the Study Areas shown on Exhibit E with the designated 2040 Growth Concept design type, ~~and more precisely identified in the Industrial Land Alternative Analysis Study, February, 2004, Item (c) in Appendix A,~~ subject to the conditions set forth in Exhibit F, and to exclude tax lots 1300, 1400 and 1500 in Study Area 62 ~~and the southeast portion of Study Area 9 from the UGB~~, also shown on Exhibit E and more precisely identified in the Staff Report, "In Consideration of Ordinance No. 04-1040, For the Purpose of Amending the Metro Urban Growth Boundary, the Regional Framework Plan and the Metro Code to increase the capacity of the Boundary to Accommodate Growth in Industrial Employment", Item (a) in Appendix A. Exhibits E and F are attached and incorporated into this ordinance to comply with the second and third items in LCDC's "Partial Approval and Remand Order 03-WKTASK-001524."

6. Ordinance No. 02-969B is hereby amended to change the 2040 Growth Concept design type designation for that 90-acre portion of Study Area 12 that projects from the rest of the study area to the southeast along Highway 26 from "Inner Neighborhood" to "Regionally Significant Industrial Area."

~~6~~7. The Appendix, attached and incorporated into this ordinance, is hereby adopted in support of the amendments to the UGB, the Regional Framework Plan and the Metro Code in sections 1 through 3 of this ordinance. The following documents comprise the Appendix:

a. Staff Report, "In Consideration of Ordinance No. 04-1040, For the Purpose of Amending the Metro Urban Growth Boundary, the Regional Framework Plan and the Metro Code to increase the capacity of the Boundary to Accommodate Growth in Industrial Employment", April 5, 2004.

b. 2002-2022 Urban Growth Report: An Employment Land Need Analysis, June 24, 2004 Supplement.

c. Industrial Land Alternative Analysis Study, February, 2004.

d. Measure 26-29 Technical Report: Assessment of the Impacts of the June, 2004, UGB Expansion on Property Owners.

e. Industrial Land Expansion Public Comment Report, March, 2004.

f. "An Assessment of Potential Regionally Significant Industrial Areas", memorandum from Mary Weber to Dick Benner, October 21, 2003.

g. "Recommended Factors for Identifying RSIAs", memorandum from Mary Weber to MTAC, June 30, 2003.

h. "Slopes Constraints on Industrial Development", memorandum from Lydia Neill to David Bragdon, November 25, 2003.

i. "Limited Choices: The Protection of Agricultural Lands and the Expansion of the Metro Area Urban Growth Boundary for Industrial Use", prepared by the Metro Agricultural Lands Technical Workgroup, April, 2004.

j. "Technical Assessment of Reducing Lands within Alternatives Analysis Study Areas", memorandum from Lydia Neill to David Bragdon, October 30, 2003.

k. Agriculture at the Edge: A Symposium, October 31, 2003, Summary by Kimi Iboshi Sloop, December, 2003.

m. "Industrial Land Aggregation Methodology, Test and Results", memorandum from Lydia Neill to David Bragdon, September 24, 2003.

n. "Industrial Areas Requested by Local Jurisdictions", memorandum from Tim O'Brien to Lydia Neill, July 29, 2003.

o. "Industrial Land Locational and Siting Factors", memorandum from Lydia Neill to David Bragdon, June 9, 2003.

p. "A Review of Information Pertaining to Regional Industrial Lands", memorandum from Dick Benner to David Bragdon, January 26, 2004.

q. Map of Freight Network and Freight Facilities, Metro, November, 2003.

r. "Evaluating the Industrial Land Supply with Projected Demand", memorandum from Lydia Neill to David Bragdon, May 14, 2003.

s. "Identifying 2003 Industrial Land Alternatives Analysis Study Areas", memorandum from Tim O'Brien to Lydia Neill, July 9, 2003.

t. "For the Purpose of Reducing the Land Under Consideration in the 2002 and 2003 Alternatives Analysis for Meet the Remaining Need for Industrial Land through Urban Growth Boundary Expansion", Staff Report, November 18, 2003.

u. "Formation of Industrial Neighborhoods", memorandum from Lydia Neill to David Bragdon, October 24, 2003.

v. "Developed Lots 5 Acres and Smaller Outside the UGB", memorandum from Amy Rose to Lydia Neill, November 18, 2003.

w. "Employment Land Included in the 2002 Urban Growth Boundary Expansion", memorandum from Andy Cotugno to David Bragdon, March 10, 2003.

x. "Identifying Additional Land for Industrial Purposes," memorandum from Tim O'Brien to Lydia Neill, March 7, 2003.

y. Staff Report, "In Consideration of Ordinance No. 04-1040B, For the Purpose of Amending the Metro Urban Growth Boundary, the Regional Framework Plan and the Metro Code to increase the Capacity of the Boundary to Accommodate Growth in Industrial Employment", June 21, 2004.

~~7~~8. The Findings of Fact and Conclusions of Law in Exhibit G, attached and incorporated into this ordinance, explain how this ordinance complies with state law, the Regional Framework Plan and the Metro Code.

ADOPTED by the Metro Council this 24th day of June, 2004.

David Bragdon, Council President

ATTEST: Approved as to Form:

Christina Billington, Recording Secretary Daniel B. Cooper, Metro Attorney

Exhibit F to Ordinance No. 04-1040B
Conditions on Addition of Land to the UGB

I. GENERAL CONDITIONS APPLICABLE TO ALL LANDS ADDED TO THE UGB

A. The city or county with land use planning responsibility for a study area included in the UGB shall complete the planning required by Metro Code Title 11, Urban Growth Management Functional Plan ("UGMFP"), section 3.07.1120 ("Title 11 planning") for the area. Unless otherwise stated in specific conditions below, the city or county shall complete Title 11 planning within two years after the effective date of this ordinance. Specific conditions below identify the city or county responsible for each study area.

B. The city or county with land use planning responsibility for a study area included in the UGB, as specified below, shall apply the 2040 Growth Concept design types shown on Exhibit E of this ordinance to the planning required by Title 11 for the study area.

C. The city or county with land use planning responsibility for a study area included in the UGB shall apply interim protection standards in Metro Code Title 11, UGMFP, section 3.07.1110, to the study area until the effective date of the comprehensive plan provisions and land use regulations adopted to implement Title 11.

D. In Title 11 planning, each city or county with land use planning responsibility for a study area included in the UGB shall recommend appropriate long-range boundaries for consideration by the Council in future expansions of the UGB or designation of urban reserves pursuant to 660 Oregon Administrative Rules Division 21.

E. Each city or county with land use planning responsibility for an area included in the UGB by this ordinance shall adopt provisions – such as setbacks, buffers and designated lanes for movement of slow-moving farm machinery – in its land use regulations to enhance compatibility between urban uses in the UGB and agricultural practices on adjacent land outside the UGB zoned for farm or forest use.

F. Each city or county with land use planning responsibility for a study area included in the UGB shall apply Title 4 of the UGMFP to those portions of the study area designated Regionally Significant Industrial Area ("RSIA"), Industrial Area or Employment Area on the 2040 Growth Concept Map (Exhibit C). If the Council places a specific condition on a RSIA below, the city or county shall apply the more restrictive condition.

G. In the application of statewide planning Goal 5 (Natural Resources, Scenic and Historic Areas, and Open Spaces) to Title 11 planning, each city and county with land use responsibility for a study area included in the UGB shall comply with those provisions of Title 3 of the UGMFP acknowledged by the Land Conservation and Development Commission ("LCDC") to comply with Goal 5. If LCDC has not acknowledged those provisions of Title 3 intended to comply with Goal 5 by the deadline for completion of Title 11 planning, the city or county shall consider, in the city or county's application of Goal 5 to its Title 11 planning, any inventory of regionally significant Goal 5 resources and any preliminary decisions to allow, limit or prohibit conflicting uses of those resources that is adopted by resolution of the Metro Council.

H. Each city and county shall apply the Transportation Planning Rule (OAR 660 Div 012) in the planning required by subsections F (transportation plan) and J (urban growth diagram) of Title 11.

II. SPECIFIC CONDITIONS FOR PARTICULAR AREAS

A. Damascus Area

1. Clackamas County and Metro shall complete Title 11 planning requirements through the incorporation of this area into the greater Damascus/Boring Concept Plan planning effort currently underway. This planning shall be completed within the same time frame as specified in Ordinance No. 02-969B.

2. In the planning required by Title 11, subsections (A) and (F) of section 3.07.1120, Clackamas County or any future governing body responsible for the area shall provide for annexation of those portions of the area whose planned capacity is sufficient to support transit to the Tri-met District.

3. In the planning required by Title 11, subsections (A) and (F) of section 3.07.1120, Clackamas County or any future governing body responsible for the area shall provide for annexation of those portions of the area whose planned capacity is sufficient to support transit to the Tri-met District.

B. Beavercreek Area

1. Clackamas County or, upon annexation to Oregon City, the city and county, with Metro, shall complete Title 11 planning for the area.

2. This area shall be planned in conjunction with the adjoining tax lot added to the UGB in 2002, under Ordinance No. 02-969B.

~~C. Borland Area – North of I-205~~

~~1. Clackamas County or, upon annexation to the City of Tualatin, the city and county, in coordination with the Cities of Lake Oswego, Tualatin, and West Linn and Metro, shall complete Title 11 planning within four years following the effective date of Ordinance No. 04-1040. The county and city, in conjunction with Lake Oswego and West Linn and Metro shall recommend long-range boundaries in the Stafford Basin and general use designations for consideration by the Council in future expansions of the UGB.~~

~~2. Until the effective date of new regulations adopted pursuant to Title 11, the city or county with land use planning responsibility for the area shall not allow the division of a lot or parcel that is 50 acres or larger into lots or parcels smaller than 50 acres.~~

~~D~~C. Tualatin Area

1. Washington County or, upon annexation to the Cities of Tualatin or Wilsonville, the cities, in conjunction with Metro, shall complete Title 11 planning within ~~four~~ two years following the selection of the right-of-way alignment for the I-5/99W Connector, or within seven years of the effective date of Ordinance No. 04-1040, whichever occurs earlier.

2. Title 11 planning shall incorporate the general location of the projected right of way ~~location~~ alignment for the I-5/99W connector and the Tonquin Trail as shown on the 2004 Regional Transportation Plan. If the selected right-of-way for the connector follows the approximate course of the "South Alignment," as shown on the Region 2040 Growth Concept Map, as amended by Ordinance No. 03-1014, October 15, 2003, the portion of the Tualatin Area that lies north of the right-of-way shall be designated "~~Inner~~Outer Neighborhood" on the Growth Concept Map; the portion that lies south shall be designated "Industrial."

3. The governments responsible for Title 11 planning shall consider using the I-5/99W connector as a boundary between the city limits of the City of Tualatin and the City of Wilsonville in this area.

~~E~~D. Quarry Area

1. Washington County or, upon annexation to the cities of Tualatin or Sherwood, the cities, and Metro shall complete Title 11 planning for the area.

2. Title 11 planning shall, if possible, be coordinated with the adjoining area that was included in the UGB in 2002 under Ordinance No. 02-969B.

3. Until the effective date of new regulations adopted pursuant to Title 11, the city or county with land use planning responsibility for the area shall not allow the division of a lot or parcel that is 50 acres or larger into lots or parcels smaller than 50 acres.

4. Title 11 planning shall incorporate the general location of the projected right-of-way for the Tonquin Trail as shown on the 2004 Regional Transportation Plan.

~~F~~E. Coffee Creek Area

1. Washington and Clackamas Counties or, upon annexation of the area to the ~~City~~ cities of Tualatin or Wilsonville, the city, ~~and~~ in conjunction with Metro, shall complete the Title 11 planning for the area within ~~four~~ two years following the selection of the right-of-way alignment for the I-5/99W Connector, or within seven years of the effective date of Ordinance No. 04-1040B, whichever occurs earlier.

2. ~~The concept~~ Title 11 planning shall incorporate the general location of the projected right of way location for the I-5/99W connector and the Tonquin Trail as shown on the 2004 Regional Transportation Plan.

~~G. Wilsonville East Area~~

~~1. Clackamas County or, upon annexation of the area to the City of Wilsonville, the city, and Metro shall complete the Title 11 planning for the area within two years of the effective date of Ordinance No. 04-1040.~~

~~2. In the planning required by Title 11 a buffer shall be incorporated to mitigate any adverse effects of locating industrial uses adjacent to residential uses located southwest of the area.~~

~~3. Until the effective date of new regulations adopted pursuant to Title 11, the city or county with land use planning responsibility for the area shall not allow the division of a lot or parcel that is 50 acres or larger into lots or parcels smaller than 50 acres.~~

~~H~~F. Cornelius Area

1. Washington County, or, upon annexation of the area to the City of Cornelius, the city and Metro shall complete the Title 11 planning for the area.

~~I~~G. Helvetia Area

1. Washington County, or upon annexation of the area to the City of Hillsboro, the city, and Metro shall complete the Title 11 planning for the area.

2. Until the effective date of new regulations adopted pursuant to Title 11, the city or county with land use planning responsibility for the area shall not allow the division of a lot or parcel that is 50 acres or larger into lots or parcels smaller than 50 acres.

Appendix C

Summary of Stakeholder/Community Outreach Activities

Stakeholder Involvement and Outreach
Summary of Activities
Drafted November 1, 2007

Property owners and other interested parties in the Helvetia Concept Planning Area were encouraged to participate in the planning process. The public involvement program consisted of Helvetia Stakeholder Advisory Group meetings and an open house meeting. The meetings were open to all property owners and interested parties in the planning area. The following summarizes all of the public involvement activities for the Helvetia Concept Planning Process, including an additional informational meeting held for the residents of the Country Haven Manufactured Home Community. Information was also posted to a project website at www.evergreen-helvetia.org.

Stakeholder Survey/Questionnaire

The public involvement activities were informed by a survey of property owners. In mid-February 2007, a project introduction letter, a stakeholder survey, and a planning area map were sent to each of the 22 property owners in the Helvetia Concept Plan Area. The letter also invited property owners to attend the first stakeholder meeting for their plan area, where a summary of the survey responses was presented. For the Helvetia area, 12 surveys were received out of a total of 22 mailed. The following is a summary of the responses.

The following responses give background on those who returned the Helvetia Area surveys:

- UGB Expansion: 10 knew of UGB expansion, 1 was not sure about outcome of UGB expansion, 1 did not know about UGB expansion
- Ownership: 5 owned for over 20 years, 4 owned for 11-20 years, 1 owned for 6-10 years, 2 owned for 1-5 years
- Current use: 7 owner-occupied, 2 renter-occupied, 8 agricultural uses, 1 business, 1 vacant

The Helvetia Area respondents identified the following as issues to address during planning:

- Transportation
    - Connections
    - Road improvements, sidewalks & shoulders
    - Highway and local configurations
    - Traffic—types, amounts. and control
    - Access
- Services—water and sewer
- Stormwater/drainage – increase in impervious surfaces
- Zone types / what types of businesses allowed
- Pollution—noise and air
- Visual
- Environment – natural areas, ground water protection
- Talk to neighbors together / consolidate properties
- Impact on existing residential, especially those not interested in moving

- Cost to current owners – taxes, development fees
- Property values

The Helvetia Area respondents offered the following suggestions to guide future growth:

- Continue to allow for residential and agriculture uses:
    - Don't use productive agricultural land first
    - Leave residential / agricultural uses alone
    - Allow rural commercial zoning
- Allow flexibility
- Offer property transition incentives
- Preserve beauty of environment / clean businesses
- Keep property owners and others involved in process
- Move forward quickly & efficiently

Helvetia Stakeholder Advisory Group (HSAG) Meeting #1 – 3/14/07

The first HSAG meeting was held on March 14, 2007 from 6:00 to 8:00 p.m. at Liberty High School. The purpose of the meeting was to introduce the project, including history and context, outline the process, and identify project-related stakeholder issues, concerns, and objectives. The sign-in sheets document 16 attendees. Wink Brooks of City of Hillsboro introduced the project and Frank Angelo of Angelo Planning Group gave a presentation on the planning effort. Vaughn Brown of JLA discussed the purpose and role of the HSAG group and shared the results of the property owner questionnaire.

The presentation covered:

- Purpose of the meeting
- Role of the HSAG
- Planning area
- Planning context
- Planning objectives
- Schedule, including stakeholder involvement
- Results of the stakeholder survey/questionnaire

Meeting materials included:

- Handouts of the presentation
- Purpose and role of the HSAG
- Hillsboro Zoning Ordinance No. 1945 – M-P Industrial Park Zone Map for reference

Participants asked questions and commented on the information presented. The following summarizes questions, responses to common questions, issues, and concerns heard at the meeting:

- Is the Evergreen Area already in the UGB? Yes, the DLCD just needs to formally adopt. The eastern half of the Evergreen Area is designated as a Regionally Significant Industrial Area.
- Discussion about the FD-20 zoning being placed on the Helvetia and Evergreen Areas to restrict land divisions below 20 acres and limit premature development. Can additions, remodels, rebuilds, and drilling wells still be done in the County? All properties are

currently under the jurisdiction of Washington County, so should check with the County on any development changes or permits. (The project team sent the HSAG information via email for Ordinance 671 WLUT – FD 20 Zoning change.)

- Will this affect property taxes? No, properties are still in Washington County and have the same use (some changes with FD-20).
- How long does this process take? Reviewed the schedule.
- Will there be setbacks, minimum lot coverage, and other design review considerations?
- When are we built out? The area is expecting 400,000 more people by 2030. Metro is looking at the concept of urban reserves.
- Where will Jacobson Road be aligned? This will need to be discussed.
- What happens to smaller lots?
- Discussion about how a zone overlay might work for Helvetia.
- Discussion about voluntary annexation and how that works. Does annexation have to be contiguous? Not necessarily.
- Discussion about phasing and implementation.
- How is the project being funded? The Metro Construction Excise tax funds concept planning.
- How will wells be protected? New urban development will not be served by wells.
- Can existing properties annex to the City as non-conforming uses? Yes, but there might be restrictions.
- Can parts of properties be annexed? This would depend on whether the property could be partitioned.
- Concern about price of development fees. How will cost of infrastructure be allocated to property owners? Development would pay for partial improvements as they are made. Traffic Impact Fees will be collected. The planning team should have more information about financing and infrastructure in the summer or fall.
- Concern about the length of process and how that affects renters.
- Comment about Clean Water Services currently using some properties for stormwater retention.

Helvetia Stakeholder Advisory Group (HSAG) Meeting #2 and Open House – 4/18/07

The second HSAG meeting was held on April 18, 2007 from 6:00 to 8:00 p.m. at the Hillsboro Civic Center. The meeting was held jointly with a public open house. The meeting was advertised by a project newsletter sent to all Evergreen and Helvetia planning area property owners, as well as surrounding property owners. The purpose of the meeting was to review the existing conditions, which would be the basis for the planning. The sign-in sheets document 15 attendees. The format of the meeting was an open house with a presentation, including question and answer session. Pat Ribellia of City of Hillsboro introduced the project and Frank Angelo of Angelo Planning Group gave a presentation on the existing conditions. Shuki Einstein of CH2M Hill presented information on economics findings, and Carl Springer of DKS presented on the transportation existing conditions.

The presentation covered:

- Project update

- Background and goals
- Existing conditions

Meeting materials included:

- Handouts of the presentation

Participants asked questions and comments on the information presented. The following is a summary of issues from the flipchart notes taken at the meeting:

- Where will the 50 acre site be located?
- What type of industrial development?
- What is an industrial sanctuary?
- Will there be housing? No.
- Concern about air pollution.
- What happens if there is an accident in the area?
- If 50 acres are developed, can others develop as housing? No, all industrial.
- Will Jacobson Road be relocated to the north? This will need to be addressed in the County's/State's transportation plan.
- What about the status of the Century Boulevard project?
- Maybe a roundabout at Helvetia & Jacobson would work.
- Concerns about diverting stormwater to the residential Meek Road area.
- How does the plan affect area south of Jacobson? Doesn't change.
- When will development break ground? Properties would need to annex first.
- Are Evergreen and Shute still industrial? Yes.
- What about existing residential? Properties can choose whether or not to annex.
- There may be burial grounds in the area.
- One attendee has 2006 flood photos and can give those to the project team.

Helvetia Stakeholder Advisory Group (HSAG) Meeting #3 – 7/24/07

The third HSAG meeting was held on July 24, 2007 from 6:00 to 8:00 p.m. at the Hillsboro Civic Center. All property owners and previously interested parties were invited to attend. The purpose of the meeting was to review the draft development concepts and illustrations. The sign-in sheets document 9 attendees. Pat Ribellia of City of Hillsboro gave a brief update and introduction and Frank Angelo of Angelo Planning Group presented the draft concepts. There were few questions and concerns at this time and the meeting ended early.

The presentation covered:

- Project update
- Overview of concepts
- Helvetia Development Program
- Helvetia Conceptual Illustrations

Meeting materials included:

- Handouts of the presentation

Participants asked questions and commented on the information presented. The following summarizes questions, responses to common questions, issues, and concerns heard at the meeting:

- Discussion and clarification about the annexation process.
- Discussion about funding infrastructure improvements.
- One-on-one discussion after the meeting with property owners.

Helvetia Stakeholder Advisory Group (HSAG) Meeting #4 – 10/17/07

The fourth and final HSAG meeting was held on October 17, 2007 from 6:00 to 8:00 p.m. at the Hillsboro Civic Center. All property owners and previously interested parties were invited to attend. The purpose of the meeting was to review the final development concepts and illustrations that would be forwarded to the Planning Commission and Council. The sign-in sheets document 12 attendees. Pat Ribellia of City of Hillsboro gave a brief update and introduction and Frank Angelo of Angelo Planning Group presented the concepts and development proposals.

The presentation covered:

- Project update
- Helvetia Development Program
- Helvetia Conceptual Illustrations
- Implementation (Policy and Code language)

Meeting materials included:

- Handouts of the presentation
- Copies of the resolutions to amend the City's Comprehensive Plan and Zoning ordinance (2 documents)

Participants asked questions and commented on the information presented. The following summarizes questions, responses to common questions, issues, and concerns heard at the meeting:

- Discussion about the affects of industrial development adjacent to rural land. How or will noise ordinances apply? What about visual affects, such as lights on 24 hours a day? Pat Ribellia said there is no special noise provision being proposed. These issues can be addressed during development review. Mitigation can be looked at case by case. Staff will need to review each site plan.
- There is concern about an increase in truck traffic at the urban/rural hard edge.
- How was the buildable map developed? It is based on the FEMA flood maps. When projects come in for re-zoning, there is a more formal review by Clean Water Services, natural resource rules apply, etc. These areas have not been delineated by a biologist.
- Concerns about what type of development could occur on smaller properties.
- Will there be any plans to use non-usable or small parcels for stormwater sites, similar to the Westmark facility? This is not being planned for now, but could happen at a later date. Theoretically, one large site could be used for stormwater. Clean Water Services deals with these issues.

- Who would pay for improvements on Helvetia Road and Pubols Road? Those developing would pay for partial improvements. These are determined on a case-by-case basis.
- Properties outside the UGB will not have access to urban water and sewer.
- Has Metro accepted the 10 acre minimum? They have said they will not object to it.
- Will housing be allowed in the area in the future? No, Metro added the area for industrial development. Property owners have concerns about where workers will live.
- Concern about where dirt haul routes will be. Where will excavated dirt go? Will there be impacts to existing residential neighbors.
- Does the team have confidence that they know where cultural artifacts are? Residents believe burial sites may be a possibility near Five Oaks. The concept planning process has not done this level of research. State law will require investigation before development occurs.
- Concern about the process for locating a dog park. Concern that this may have been prime land for other uses.
- How long until the first development could occur? The Hillsboro Council needs to adopt the concept plans and then the property owner would need to go through the annexation process. If a development can meet all the rules and be willing to pick up the first share of infrastructure costs, they can develop. Development permits take about a year.
- Can properties be annexed piecemeal? Yes.
- Concern about law enforcement coverage. Suggestion that the County and City have a partnership related to traffic enforcement.

Other Meetings

Informational Meeting for Country Haven Residents – A meeting was held for the residents of the Country Haven Manufactured Home Park community on April 10, 2007 at West Union Elementary. The sign-in sheets document 12 attendees. The purpose of the meeting was to inform residents of the planning process and to answer questions. The most prevalent concern was related to displacement. The representative of the property owner from Bluestone and Hockley assured residents that they were not interested in selling or developing the property for industrial use.

Participants asked questions and commented on the information presented. The following summarizes questions, issues, and concerns heard at the meeting:

- What type of security or guarantee do residents have that they will not be forced to relocate? There is a State bill currently being considered that would help with these issues.
- How are property values and taxes affected?
- Who will pay for costs of infrastructure? Will costs be passed to Country Haven residents?
- Why industrial along Evergreen?
- Concerns about development trends that turn park sites into housing developments.
- Will there be design standards for new industrial developments?
- Can property owners sell now?
- Why haven’t lots south of the park been developed; are they zoned industrial?
- Where is Genentech from? San Jose.

- How long does it take to annex? Will residents get notified if an owner annexes?
- Do all property owners have to annex?
- Is the 50 acre owner interested in developing as industrial?
- How many property owners are participating?
- Where is residential land going to go?

Appendix D

Stakeholder Advisory Group Meeting Presentations

Helvetia Concept Plan
Stakeholder Advisory Group Meeting #1

Agenda

Wednesday, March 14, 2007

6:00pm – 8:00pm

I.	Welcome (6:00pm)	Wink Brooks / Frank Angelo
II.	Introductions & Meeting Purpose (6:15pm)	Vaughn Brown
III.	Helvetia Concept Plan Context (6:30pm)	Frank Angelo
IV.	Planning Process & Schedule (6:50pm)	Frank Angelo
V.	Issues Identification (7:15pm)	Vaughn Brown
VI.	Next Steps (7:50pm)	Frank Angelo

Helvetia Concept Plan
Stakeholder Advisory Group Meeting #1

Stakeholder Advisory Group Meeting #1

Meeting Purpose

- Provide project context, history and process.
- Identify project-related community and property owner issues, concerns and objectives.

Results

- Community awareness and understanding of project history, context, objectives and planning process.
- Feedback from key community and property owner re: project-related issues, concerns and objectives.

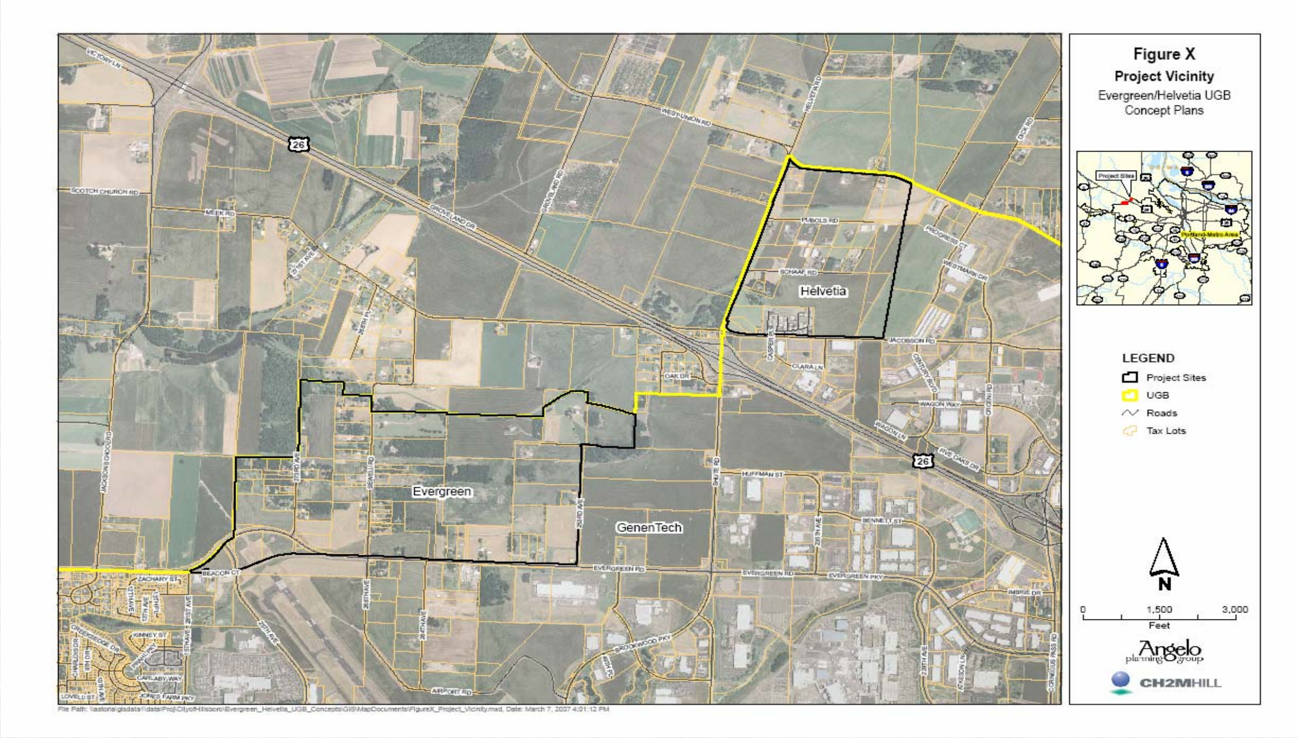
Helvetia Concept Plan
Stakeholder Advisory Group Meeting #1

The HSAG is an advisory body whose role is to:

- Become informed about and offer feedback on community needs and concerns, technical analysis, alternative plan concepts, and related concept plan elements.
- Provide feedback during advisory group discussions and through written feedback forms at open houses.
- Serve as liaison to interested and impacted community members by sharing information about the opportunities and challenges presented by the transition process.

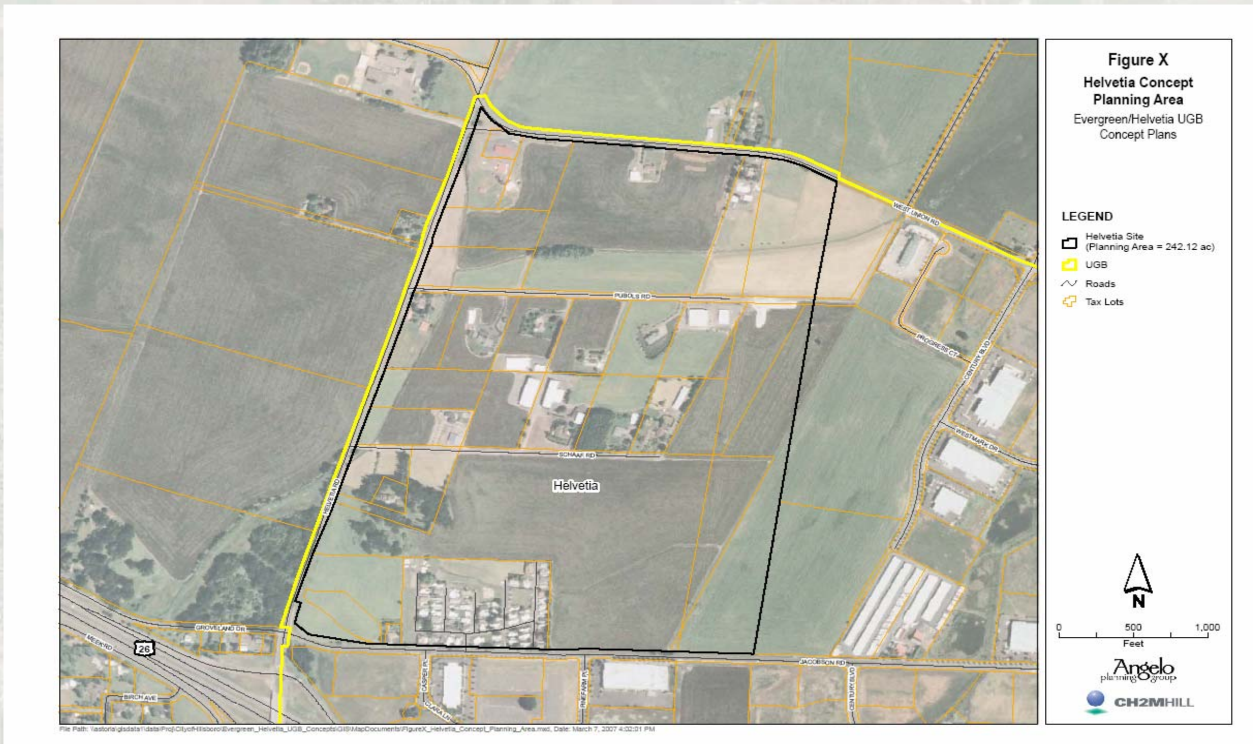
Helvetia Concept Plan
Stakeholder Advisory Group Meeting #1

Evergreen and Helvetia Road Concept Planning Areas



Helvetia Concept Plan
Stakeholder Advisory Group Meeting #1

Helvetia Concept Planning Area



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Helvetia Concept Plan
Stakeholder Advisory Group Meeting #1

Helvetia Planning Area Context

- The Helvetia Area has 249 acres and 22 property owners.
- Area added to Metro Urban Growth Boundary (UGB) in 2004.
- Metro UGB Action requires industrial use/development within the Area to accommodate regional industrial land needs.

Helvetia Concept Plan
Stakeholder Advisory Group Meeting #1

Helvetia Planning Area Context

- Helvetia Area must accommodate one 50-acre industrial site per Metro's UGB decision.
- Per a Washington County-Hillsboro Intergovernmental Agreement:
  - Hillsboro must prepare an Industrial Concept Plan for the Area for Metro approval and inclusion into the Hillsboro Comprehensive Plan.
  - Assume land use planning and regulation authority over properties in the Area upon their voluntary annexation to the City.
- Washington County required by Metro UGB decision to adopt "interim land use measures" to protect premature urban development in the Area before Concept Plan approval.

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Angelo planning group · CH2MHILL IDC · LCG · DKS Associates TRANSPORTATION SOLUTIONS · Jeanne Lawson Associates, Inc.

Helvetia Concept Plan
Stakeholder Advisory Group Meeting #1

Concept Planning Objectives

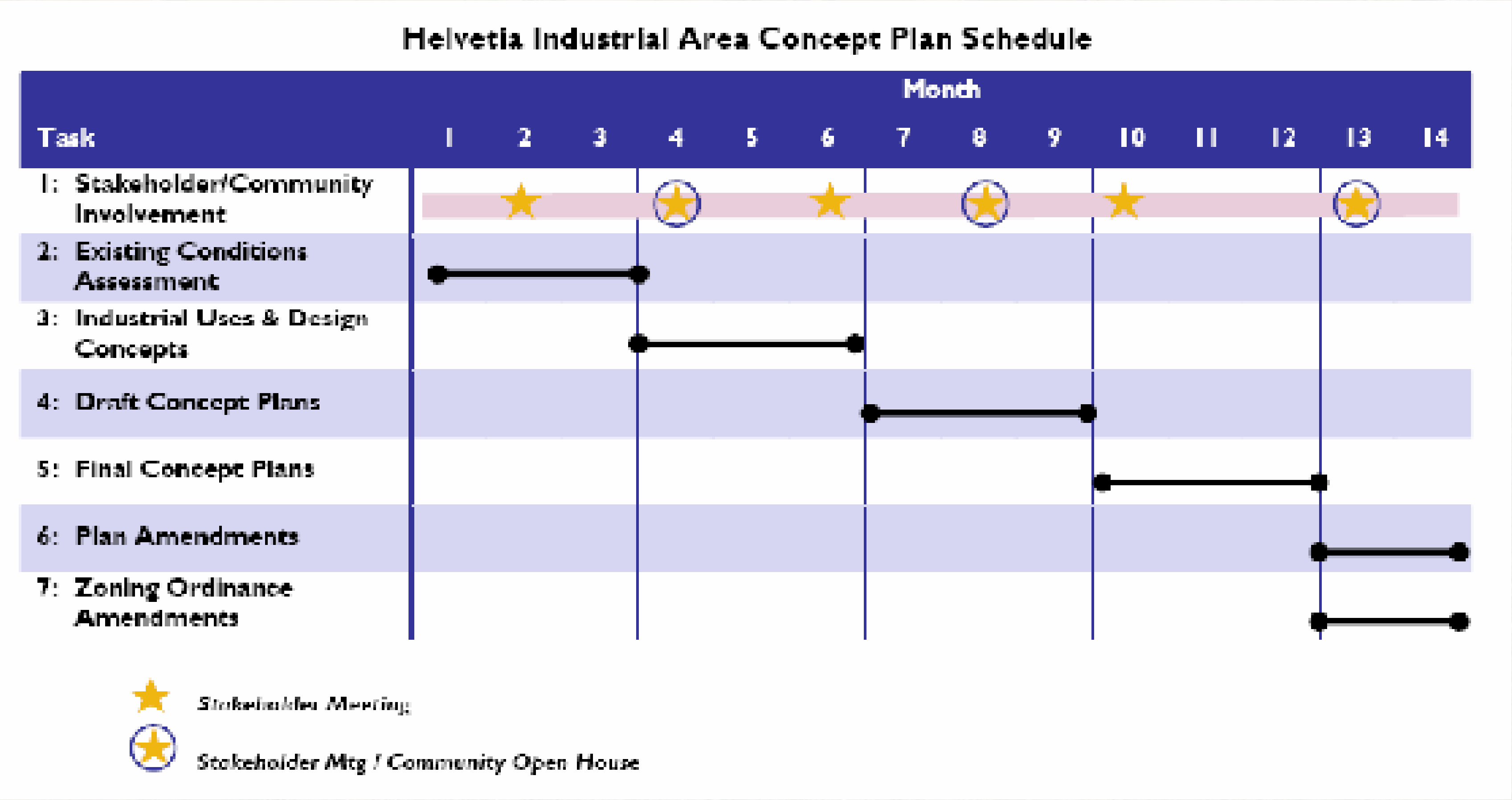
- Provide opportunities for involvement of stakeholders and property owners to help shape the development and design concepts and implementation steps;
- Comply with Metro's Title 11 Concept Planning requirements and Industrial UGB conditions of approval;
- Recommend industrial land uses and development design concepts for the Area;

Helvetia Concept Plan
Stakeholder Advisory Group Meeting #1

Concept Planning Objectives

- Plan and design public sewer, water, roads and other public infrastructure and utilities needed to enable and support Area industrial development;
- Prescribe industrial development concepts that respond to and capture market feasibility, strengths, opportunities as well as recognize Area industrial development market limitations; and
- Prepare and carry out Concept Plan implementation steps including City comprehensive plan and zoning ordinances, Area annexation strategies and Area industrial development management plans and tools as required by the Metro UGB decision.

Helvetia Concept Plan
Stakeholder Advisory Group Meeting #1



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Helvetia Concept Plan
Stakeholder Advisory Group Meeting #1

Stakeholder Involvement & Community Awareness / Input Program

Meeting	Month 1	2	3	4	5	6	7	8	9	10	11	12	13	14
ESAG Mtg 1 / Open House		★												
HSAG Mtg 1 / Open House		★												
ESAG Meeting 2				(★)										
HSAG Meeting 2				(★)										
ESAG Meeting 3						★								
HSAG Meeting 3						★								
ESAG Mtg 4 / Open House								(★)						
HSAG Mtg 4 / Open House								(★)						
ESAG Meeting 5										★				
HSAG Meeting 5										★				
ESAG Mtg 6 / Open House													(★)	
HSAG Mtg 6 / Open House													(★)	
Project Newsletters	●						●					●		
CPO-8 Briefings				8							8			

★ *Stakeholder Meeting*

(★) *Stakeholder Mtg / Community Open House*

8 *CPO-8 Project Briefings*

● *Stakeholder Newsletter*

ESAG = *Evergreen Stakeholder Advisory Group*
HSAG = *Helvetia Stakeholder Advisory Group*

Helvetia Concept Plan
Stakeholder Advisory Group Meeting #1

Summary of Questionnaire Results

12 responses from property owners (22 total mailed)

- UGB Expansion
  - 10 knew of UGB expansion
  - 1 was not sure about outcome of UGB expansion
  - 1 did not know about UGB expansion
- Ownership
  - 5 owned for over 20 years
  - 4 owned for 11-20 years
  - 1 owned for 6-10 years
  - 2 owned for 1-5 years
- Current use
  - 7 owner-occupied
  - 2 renter-occupied
  - 8 agricultural uses
  - 1 business
  - 1 vacant

Helvetia Concept Plan
Stakeholder Advisory Group Meeting #1

Issues to address identified by questionnaire respondents

- Transportation
  - Connections
  - Road improvements, sidewalks & shoulders
  - Hwy and local configurations
  - Traffic—types, amounts. and control
  - Access
- Services—water and sewer
- Stormwater/drainage – increase in impervious surfaces
- Zone types / what types of businesses allowed
- Pollution—noise and air
- Visual
- Environment – natural areas, ground water protection
- Talk to neighbors together / consolidate properties
- Impact on existing residential, especially those not interested in moving
- Cost to current owners – taxes, development fees
- Property values

Helvetia Concept Plan
Stakeholder Advisory Group Meeting #1

Suggestions to guide future growth given by questionnaire respondents

- Continue to allow for residential and agriculture uses:
  - » Don't use productive agricultural land first
  - » Leave residential / agricultural uses alone
  - » Allow rural commercial zoning
- Allow flexibility
- Offer property transition incentives
- Preserve beauty of environment / clean businesses
- Keep property owners and others involved in process
- Move forward quickly & efficiently

Helvetia Concept Plan
Stakeholder Advisory Group Meeting #1

Next Steps

Stakeholder Advisory Group Meeting #2 & Community Open House #1
Wednesday, April 18 – Hillsboro Civic Center Rooms 113 B & C

- <u>Meeting Purpose</u>
  Present and discuss analysis of existing conditions. Present and discuss initial findings on economic conditions/market strengths.

- <u>Results</u>
  Understanding and validation of existing conditions and physical opportunities and constraints. Understanding of market conditions and factors that will shape the concept plans.

Project Contacts:

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City of Hillsboro
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503.681.6481

Open House Agenda

Wednesday, April 18, 2007 **6:00 pm – 8:00 pm**

I.	Open House (6:00 pm to 6:50 pm)	
II.	Welcome & Project Update (7:00 pm)	Pat Ribellia
III.	Project Background & Goals (7:10 pm)	Frank Angelo
IV.	Existing Conditions (7:15 pm)	
	• Economics	Frank Angelo
	• Public Infrastructure	Shuki Einstein
	• Natural & Cultural Resources	Shuki Einstein
	• Transportation	Carl Springer
V.	Questions & Answers (7:45 pm)	All
VI.	Next Steps (7:55 pm)	Frank Angelo

Project Background

- The Helvetia Area has 249 acres and 22 property owners.
- Area added to Metro Urban Growth Boundary (UGB) in 2004.
- Metro UGB Action requires industrial use/development within the Area to accommodate regional industrial land needs.
- Helvetia Area must accommodate one 50-acre industrial site per Metro's UGB decision.

Project Background

- Per a Washington County-Hillsboro Intergovernmental Agreement:
  - Hillsboro must prepare an Industrial Concept Plan for the Area for Metro approval and inclusion into the Hillsboro Comprehensive Plan.
  - Assume land use planning and regulation authority over properties in the Area upon their <u>voluntary</u> annexation to the City.
- Washington County required by Metro UGB decision to adopt “interim land use measures” to protect premature urban development in the Area before Concept Plan approval.

Planning Goals

Develop a Helvetia Concept Plan that:

- Creates area-wide economic opportunities and value;
- Integrates area industrial uses with the Hillsboro Industrial Sanctuary;
- Provides adequate infrastructure to support industrial development; and
- Promotes community awareness and stakeholder involvement

Concept Planning Outcomes

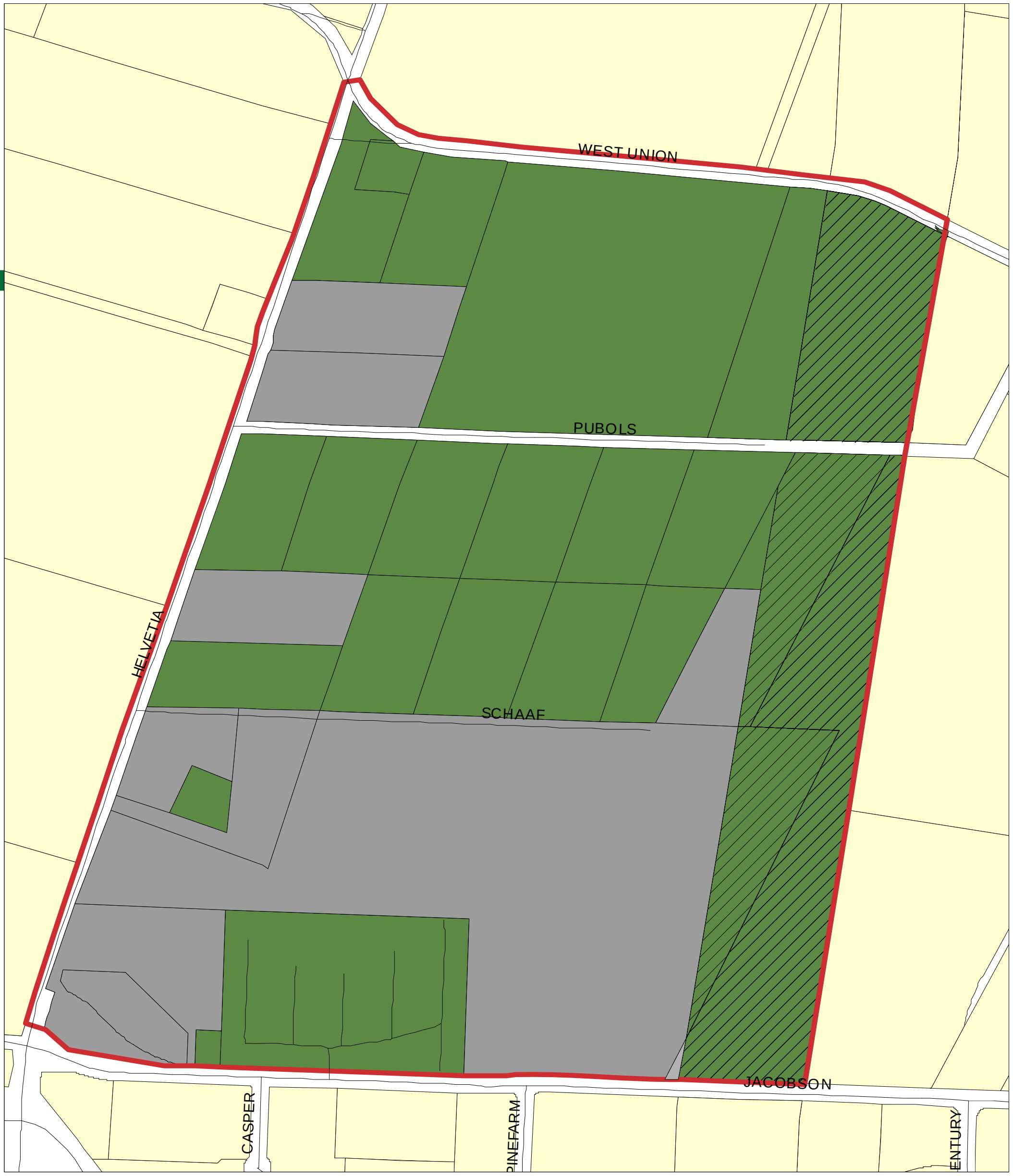
- Involvement by stakeholders and property owners to help shape the development and design concepts and implementation steps;
- Compliance with Metro's Title 11 Concept Planning requirements and Industrial UGB conditions of approval;
- Recommendations for industrial land uses and development design concepts for the Area;
- Determination of public sewer, water, roads and other public infrastructure and utilities needed to enable and support Area industrial development;

Concept Planning Outcomes

- Industrial development concepts that respond to and capture market feasibility, strengths, and opportunities; and
- Helvetia Concept Plan implementation steps including:
  - City of Hillsboro comprehensive plan and zoning ordinances amendments;
  - Area annexation strategies; and
  - Area industrial development management plans, strategies and tools.

Property Patterns

- 37% completely vacant
- 17% under BPA lines
- 44% of land owned by only 4 property owners



Vacant

Property with Improvements

Helvetia concept plan

CITY OF HILLSBORO

Economic Characteristics

Households	2005	2030	Growth
Washington County	189,925	272,998	44%
Portland region	824,955	1,207,876	46%

Employment	2005	2030	Growth
Washington County	269,660	450,970	67%
Portland region	1,075,877	1,758,330	63%

- Washington County is growing
- Jobs will grow faster than population
- 24% of jobs in Washington County are in Hillsboro

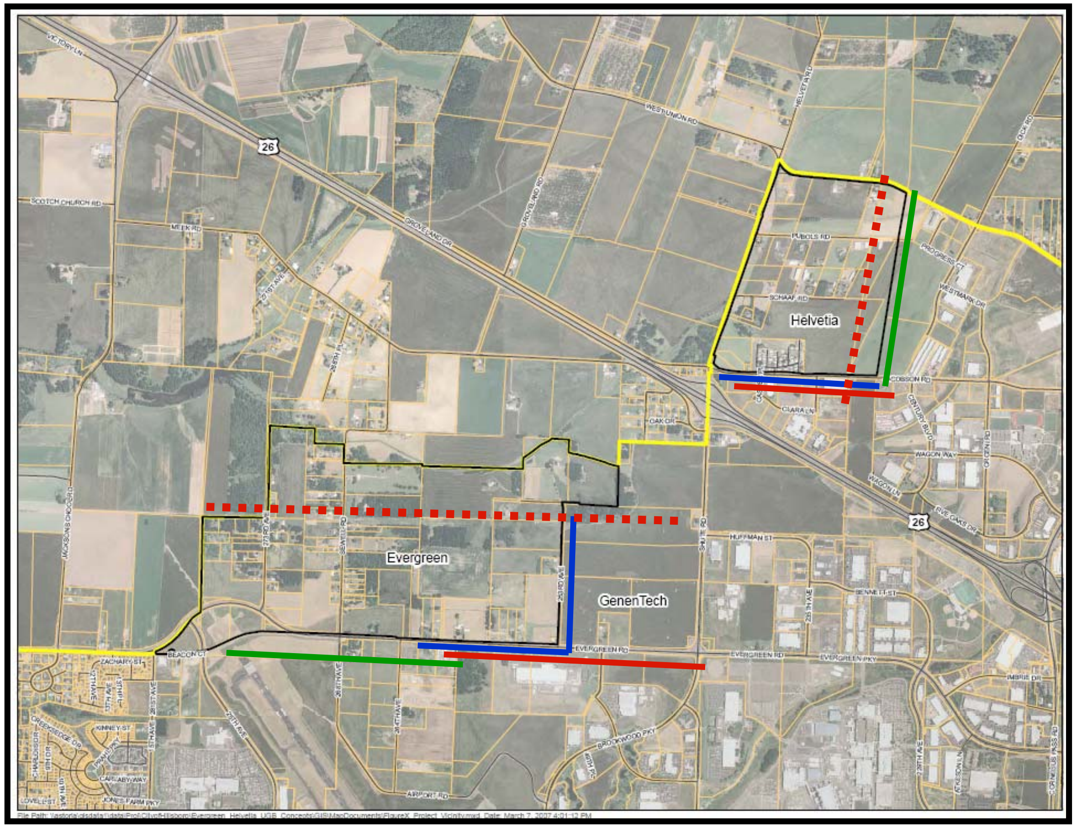
Infrastructure

Public

Sanitary
Water
Storm Water
Power BPA

Private

Power - PGE
Natural Gas - NW Natural
Tele-Com - Qwest
- Comcast
- Verizon



Evergreen & Helvetia
Concept Planning

CITY OF HILLSBORO

Natural Resources

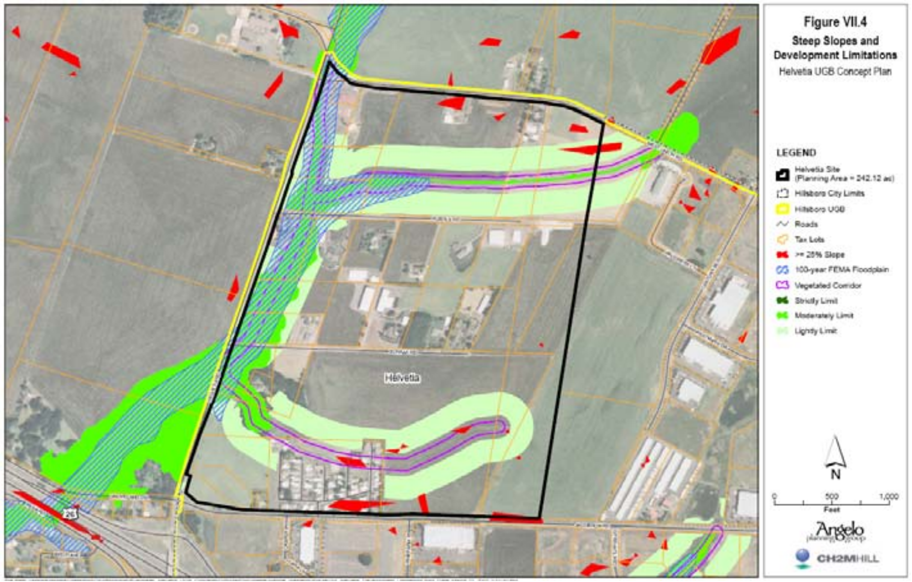
Broad Scale Natural Resource Plan

Significant Habitat Inventory (2004)
Metro Goal 5

- Parks
- Class I,II,III, Riparian
- Class B, C Habitat
- Impact Area

Development Limitations

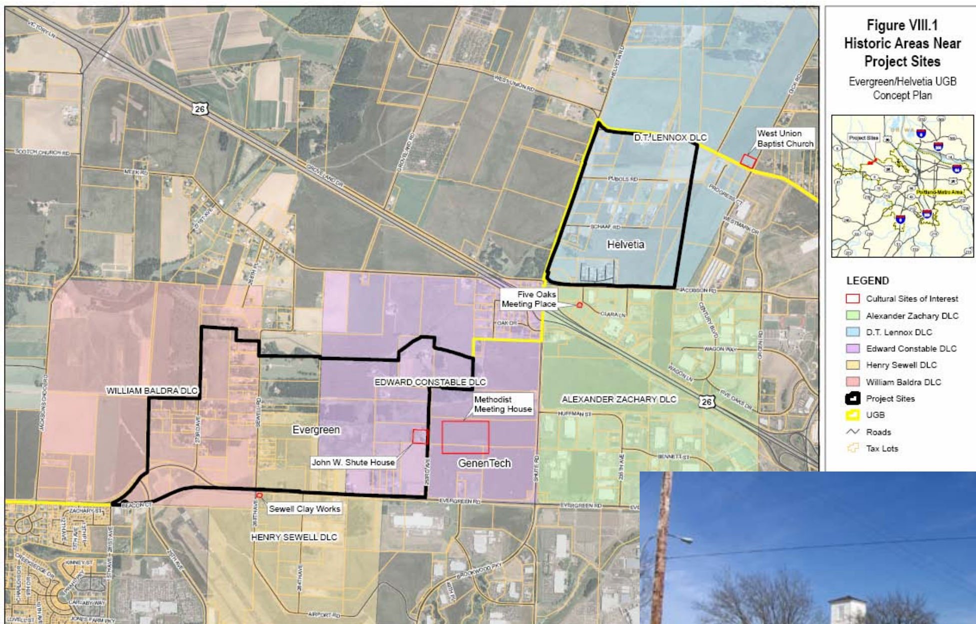
- > = 25% Slope
- 100 Year Flood Plain
- Vegetated Corridor
- Limit Level (Strict, Moderate, Light)



Helvetia concept plan

CITY OF HILLSBORO

Cultural Resources



West Union Baptist Church and Cemetery

Constructed in 1844.
The church is listed on the National Register of Historic Places.

Five Oaks Meeting place

Originally the site of five large Oregon White Oaks, 1862.
It is a locally significant historic site known as a meeting place for local historic figure Joseph Meek and other early mountain men and settlers.

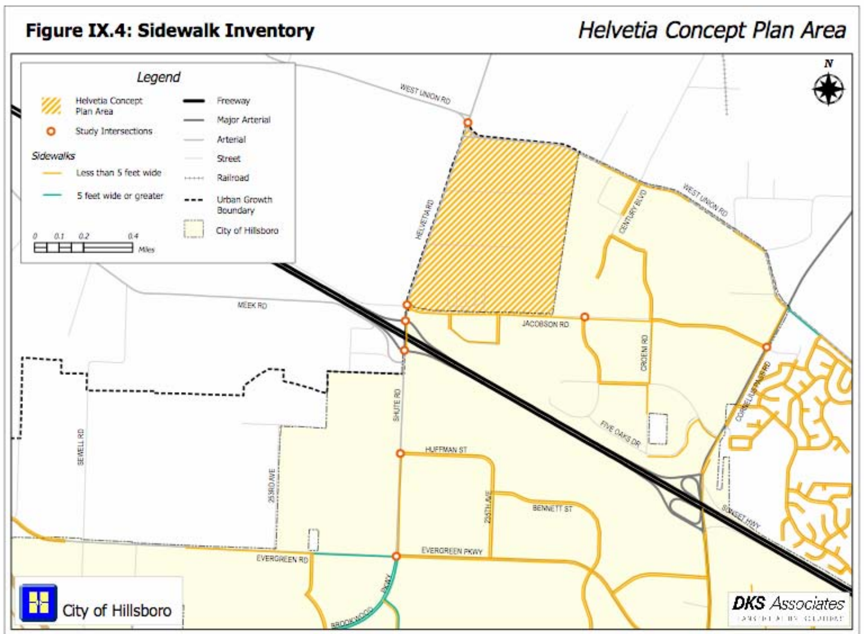

West Union Baptist Church


Five Oaks Meeting place

Helvetia concept plan

CITY OF HILLSBORO

Pedestrian System Information



- Generally rural development nearby.
- Sidewalks available one side of Jacobson
- Very limited sidewalks or trails nearby.
- Limited access across US 26.

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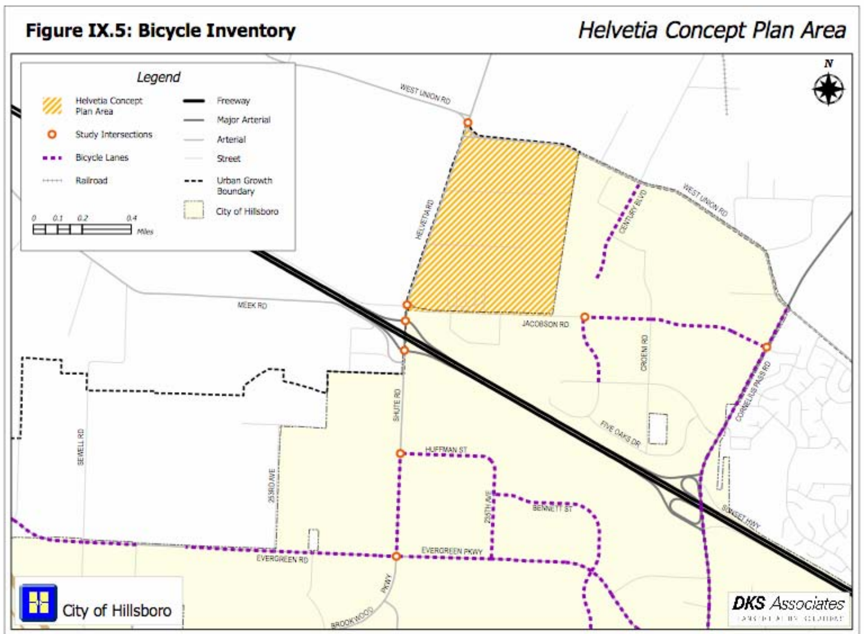
Bicycle System Information

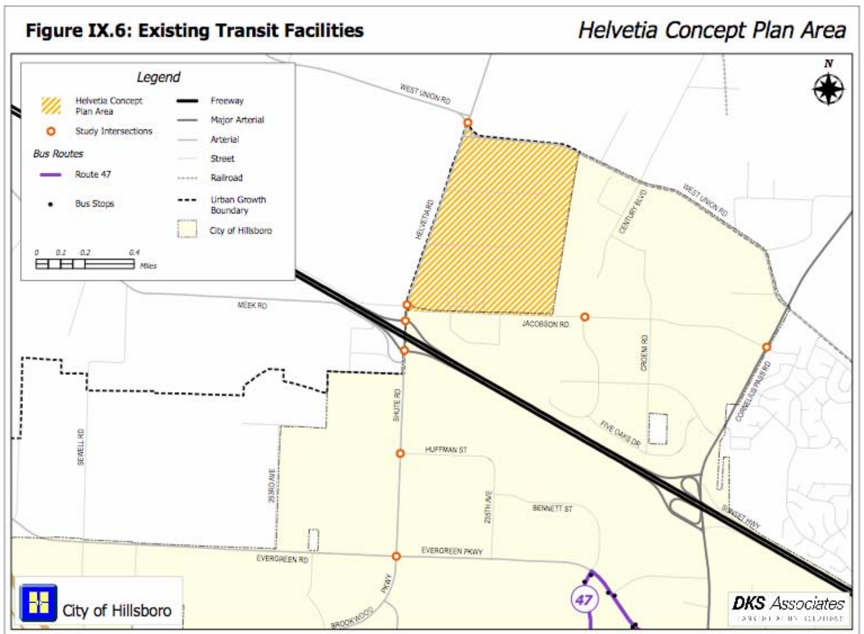


- No designated bike facilities along site frontage.
- Likely candidates for extensions along Jacobson Road or West Union Road.
- No connection across US 26 (shared road).

Helvetia concept plan

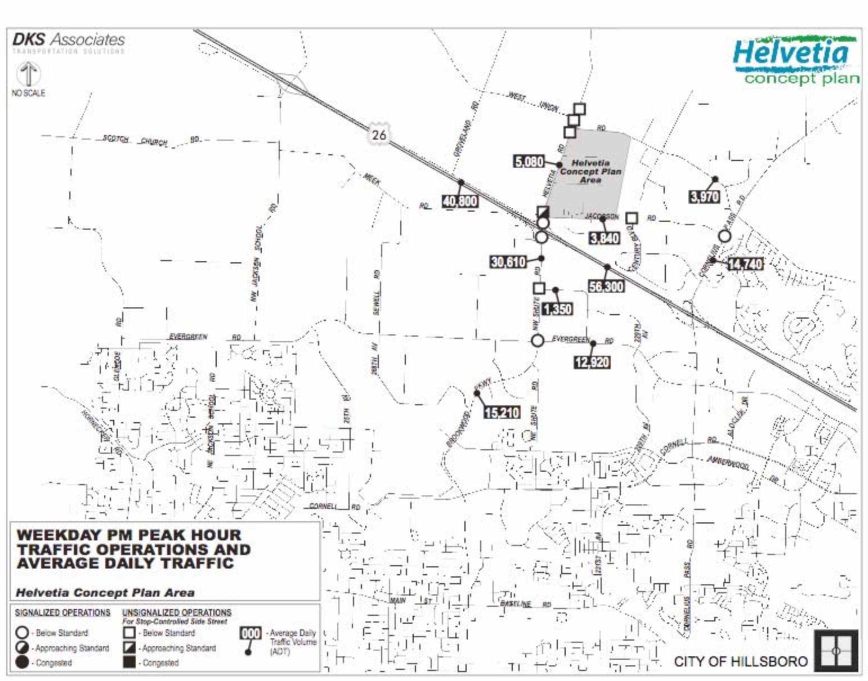
CITY OF HILLSBORO

Transit System Information



- No bus routes within convenient walking distance of site.
- Routes 46 and 47 available south of US 26.

Roadway System Information

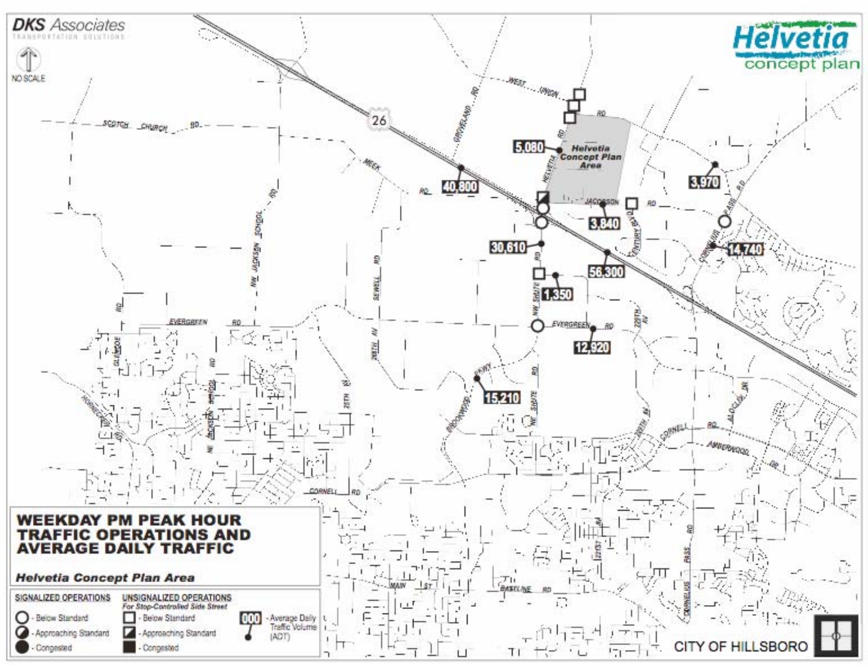


- US 26 carries 40,000 to 56,000 vehicles daily.
- Roughly 5,000 vehicles daily on Helvetia Road north of US 26.
- South of US 26, Shute Road carries 30,000 vehicles daily.
- Jacobson Road and West Union Road carry about 4,000 vehicles daily.

Helvetia concept plan

CITY OF HILLSBORO

Roadway System Conditions



- Most intersections operate within standards during peak hours.
- Approaching capacity at Helvetia Road / Jacobson Road.
- Spacing on Helvetia Road between US 26 and Jacobson needs to be addressed.

Planned Road Improvements

- US 26 Overcrossing
  - Extend Century Blvd. over US 26 (no ramps) from NW Bennett Avenue to NW Wagon Way
- 229th Avenue Extension
  - NW Wagon Way to West Union Road
- Intersection capacity added at:
  - Evergreen Ave. / Shute Road
  - Shute Road / US 26 EB Ramps
  - Shute Road / US 26 WB Ramps
- Jacobson Road to be re-aligned further north where it intersects Helvetia Road.

Next Steps

- Finalize Helvetia Existing Conditions Report
- Develop draft industrial development concepts for Helvetia, including conceptual transportation, natural resources protection, and public facilities and services plans.
- Draft Concept Plans (Summer 2007)

Project Contacts:

Frank Angelo
Angelo Planning Group
fangelo@angeloplanning.com
503.227.3664

Patrick Ribellia
City of Hillsboro
patrickr@ci.hillsboro.or.us
503.681.6481

Helvetia concept plan

CITY OF HILLSBORO

Stakeholder Advisory Committee Agenda

SAC Meeting #3
Tuesday, July 24, 2007
6:00 pm – 8:00 pm

• Project Update	Pat Ribellia
• Overview of Concepts	Frank Angelo
• Helvetia Development Program	Frank Angelo
• Helvetia Conceptual Illustrations	Frank Angelo
• Next Steps & Discussion	All

Project Update

- A potential large (200 acre) solar industrial use evaluated a site in the Evergreen planning area but chose a site in Asia. The Evergreen site was the last North American site eliminated from consideration.
- Inquiries and discussions with potential users are occurring for industrial sites in the Helvetia, Shute and Evergreen Road planning areas.
- Concept planning process has emphasized a flexible approach to attract more diverse types of industrial users in the future.
- Helvetia Concept Plan project schedule continues towards end-of-year completion.

Overview of Concepts

Ideas for Helvetia

Industry Focus

- Distribution, Support Services and Suppliers

Land/Building Needs

- Medium Campus (50-75 acres), Office/Flex/Research & Development Space, Spin-off Industries and Suppliers

Key Industrial Development Strengths

- Oregon Tax Structure – Strategic Investment Program, Single Sales Factor, Enterprise Zones
- Skilled Workforce in technology
- Technology Clusters
- Available and relatively inexpensive power
- Proximity to California and Washington – same time zone
- Hillsboro track record of success on project delivery
- Quality of life factors for employees

Key Development Assumptions

- Planning horizon for development is 2030.
- "Land banking" may occur as industrial development on larger lots occurs in phases.
- Job densities will range from 14 to 21 employees per acre.
- Employment by 2030 will range from 2,350 to 3,400 jobs in the Helvetia planning area.
- Development in Helvetia will likely be similar in character to existing industrial development to the east.

Development Types

Anticipated Development Types in Helvetia Planning Area:

- Supplier Parcels (10 to 20 acres)
- Developer Parcels (20 to 40 acres)
- Research and Development Parcels (20 to 30 acres)
- Distribution Parcels (20 to 40 acres)

Helvetia Comprehensive Plan Designation

Legend

Industrial

Helvetia concept plan

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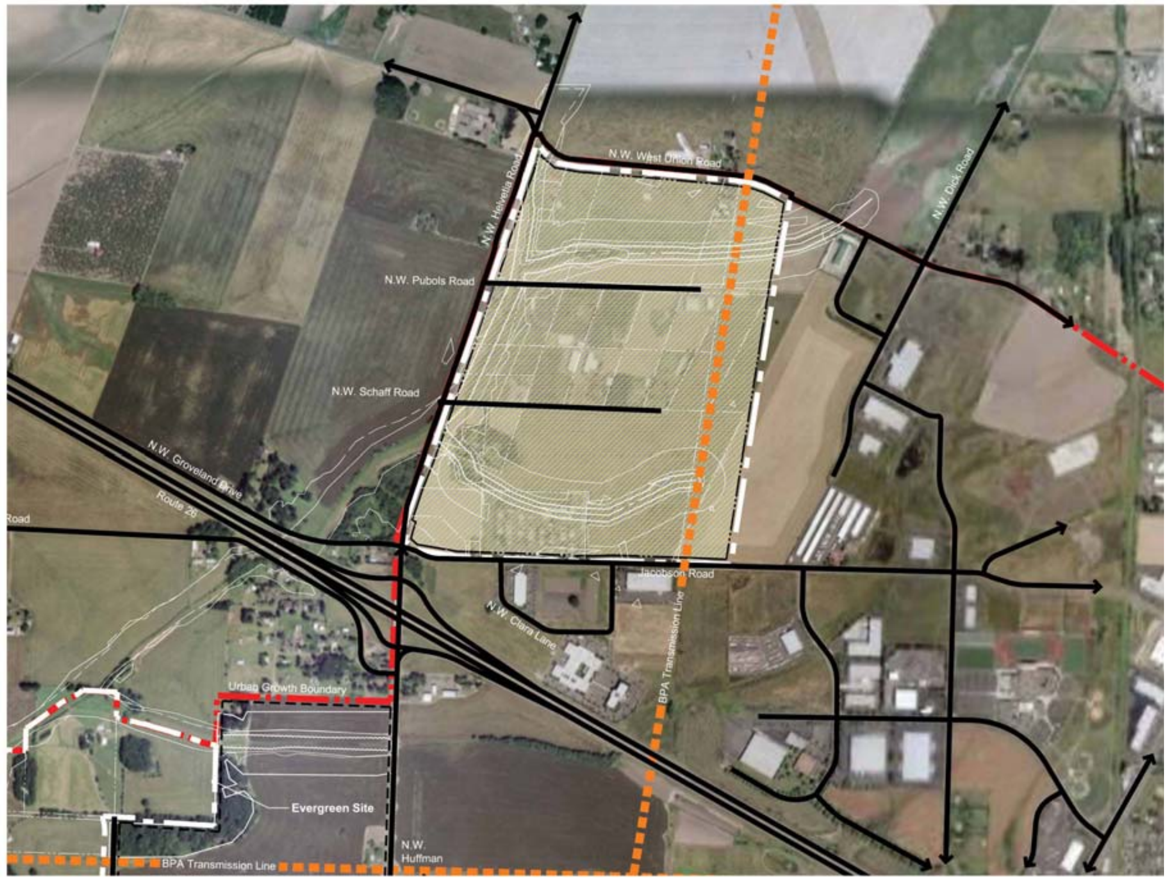
Helvetia Zoning

- Industrial Park Zone – M-P
- Helvetia Road Site Special Industrial District Overlay (RSIA)



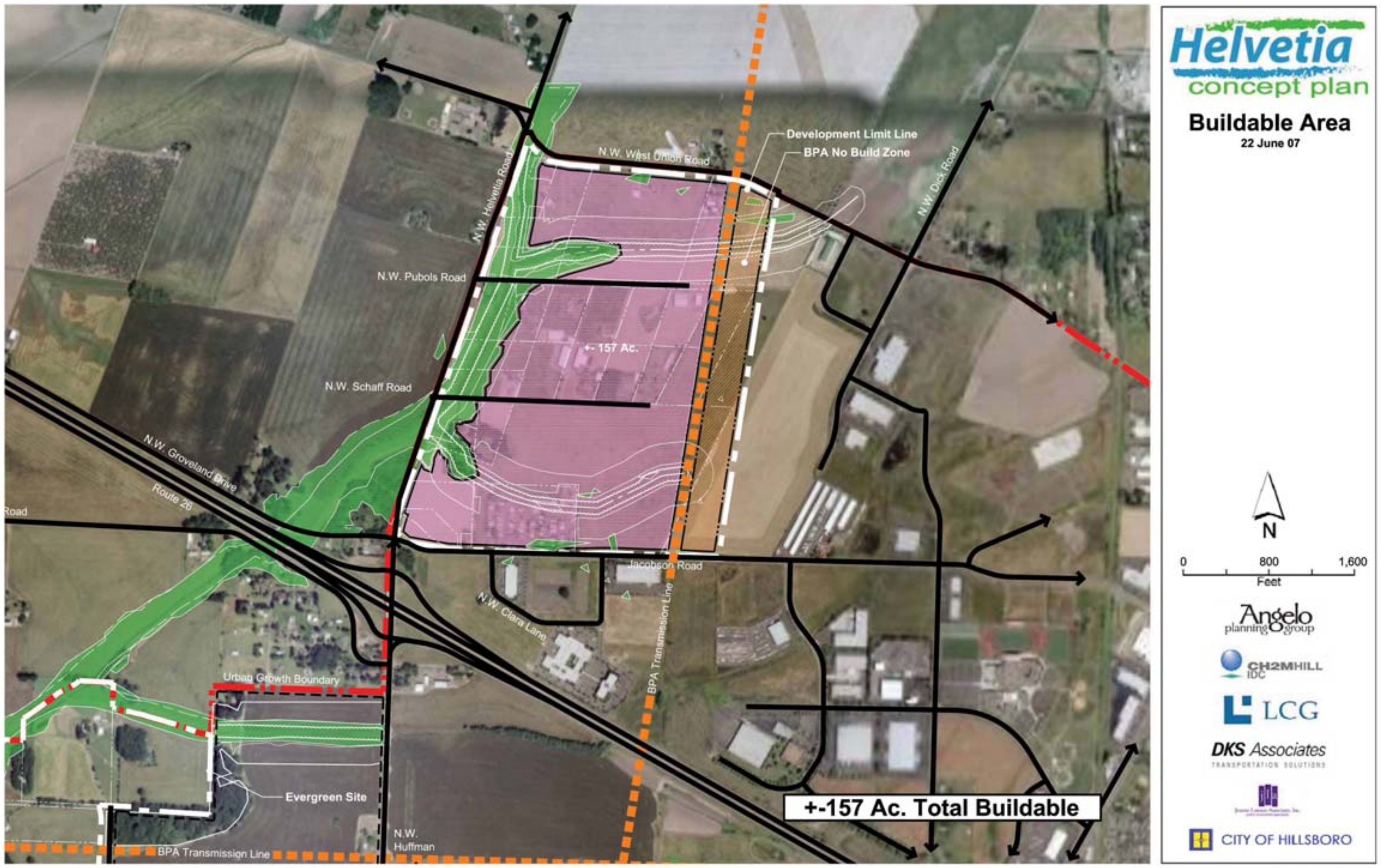
Legend

- M-P Industrial Park Zone
- Helvetia Road Site Special Industrial District Overlay (RSIA)

Helvetia concept plan

CITY OF HILLSBORO

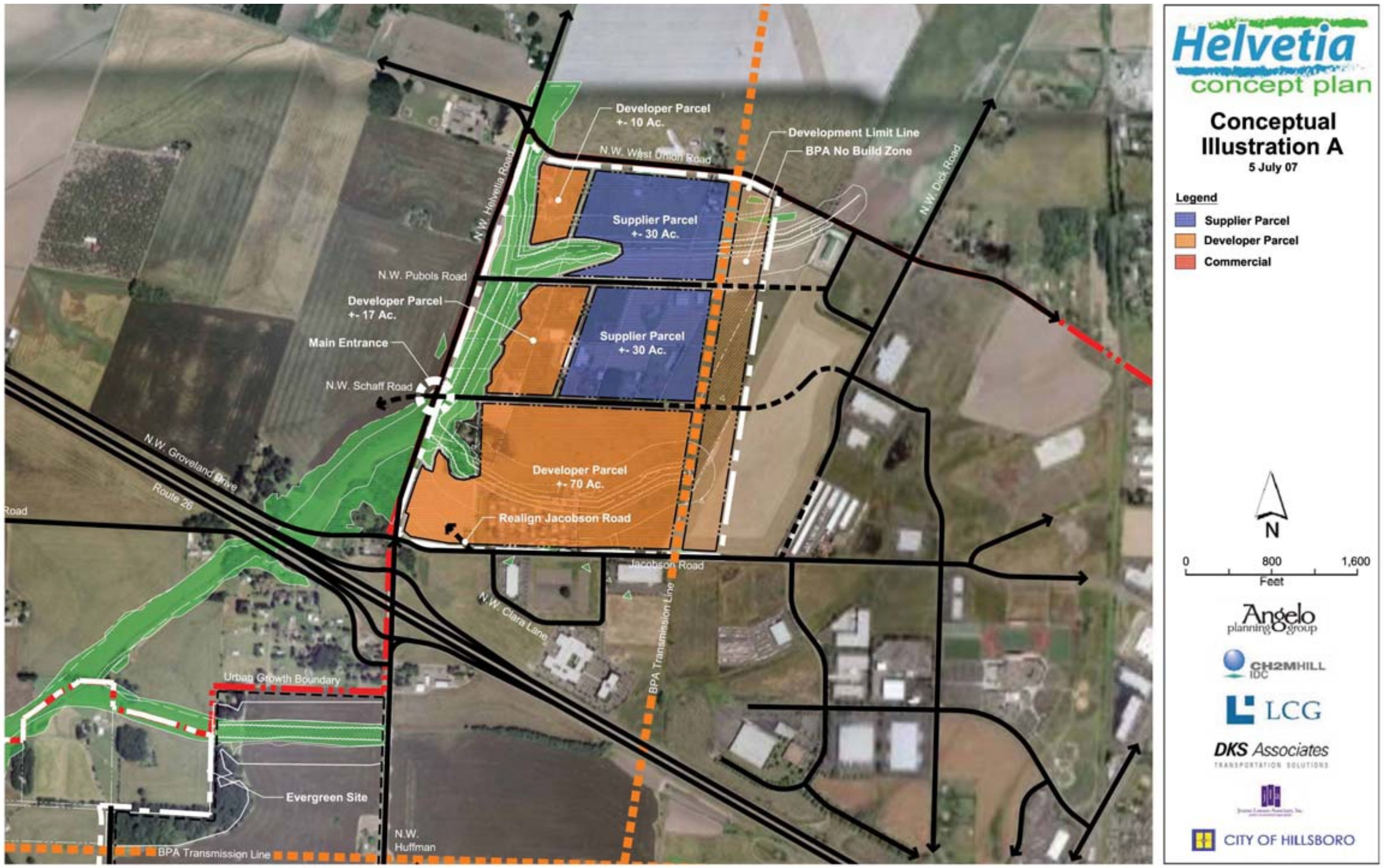
Helvetia Buildable Area



Helvetia
concept plan

CITY OF HILLSBORO

Helvetia Conceptual Illustration



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Helvetia Concept Plan Issues

- 50 acre site
- Traffic Circulation / Location of Jacobson Road
- Shute Road Interchange
- Resource Protection
- BPA Powerline
- Future UGB Expansions / Urban Reserve Areas
- Other Issues?

Helvetia Concept Plan Elements

- Industrial urban growth diagram
- Conceptual transportation plan
- Natural resource protection plan
- Conceptual facilities and services plan
- Annexation strategy
- Comprehensive Plan / Zoning Code / Ordinances

Next Steps

- Hillsboro City Council / Planning Commission Project Briefing – August 2nd
- Project Team Prepares:
  - Helvetia Concept Plan Recommendation
  - Public Facilities Recommendations and Preliminary Cost Estimates
  - Draft Comprehensive Plan and Zoning Ordinance Implementation Recommendations
- Stakeholder Meeting and Community Open House - September
- Hillsboro Planning Commission and City Council Public Hearings – October / November

Discussion

Project Contacts

Project Website: www.evergreen-helvetia.org

Patrick Ribellia: City of Hillsboro
503.681.6481
patrickr@ci.hillsboro.or.us

Frank Angelo: Angelo Planning Group
503.227.3664
fangelo@angeloplanning.com

Stakeholder Advisory Group Agenda

Helvetia SAG Meeting #4

Wednesday, October 17, 2007

6:00 pm – 8:00 pm

- Project Update & Status
- Helvetia Development Program
- Helvetia Conceptual Illustration
- Implementation (Policy and Code Language)
- Next Steps & Discussion

Helvetia concept plan

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Project Update & Status

- Final Helvetia Stakeholder / Community Meeting
- Planning Commission Workshop – September 12th
- Metro Council Worksession – October 16th
- Planning Commission Workshop – November 1st
- Planning Commission Hearing – November 14th
- City Council Hearing – December 4th

Project Update & Status

- Draft Helvetia Concept Plan is complete and includes:
  - Natural resource assessment, public utilities (water, sewer, stormwater) plans and transportation plan elements.
- Minor amendments have been made to the Conceptual Illustration previously presented.
- Resolutions to amend the City's Comprehensive Plan and Zoning Ordinance have been filed.
- Helvetia Concept Plan project schedule continues towards end-of-year completion, with adoption scheduled for December 2007.
- Inquiries and discussions with potential users continue to occur for industrial sites in the Evergreen, Shute and Helvetia Road planning areas.

Helvetia Planning Goals

Develop a Concept Plan that:

- Is stakeholder/community-driven and industrial market-responsive
- Creates area-wide economic opportunities and value by;
  - Integrating area industrial uses with the Hillsboro Industrial Sanctuary;
  - Diversifying the city's industrial base;
  - Providing adequate infrastructure to support industrial development; and
  - Promoting community awareness and stakeholder involvement

Development Program

- Anticipated Development Types in Helvetia include:
  - Sustainable Energy and Environmental Businesses
  - Biotech Campus
  - Industrial Incubators, Start-ups and Spin-offs Business Parks
  - Industry Research & Development (R&D) Parks
  - Industry Suppliers
  - Distribution Businesses

Sustainable Energy and Environmental Businesses

Helvetia concept plan

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Biotech Campus

Campus Development

Industrial Incubators, Start-ups and Spin-offs
Business Parks

Helvetia concept plan

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Industry Research and Development (R&D) Parks

Helvetia concept plan

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Industry Suppliers

Distribution Businesses

Key Development Assumptions

- Planning horizon for development is 2030.
- “Land banking” may occur as industrial development on larger lots occurs in phases.
- Job densities will range from 14 to 21 employees per acre.
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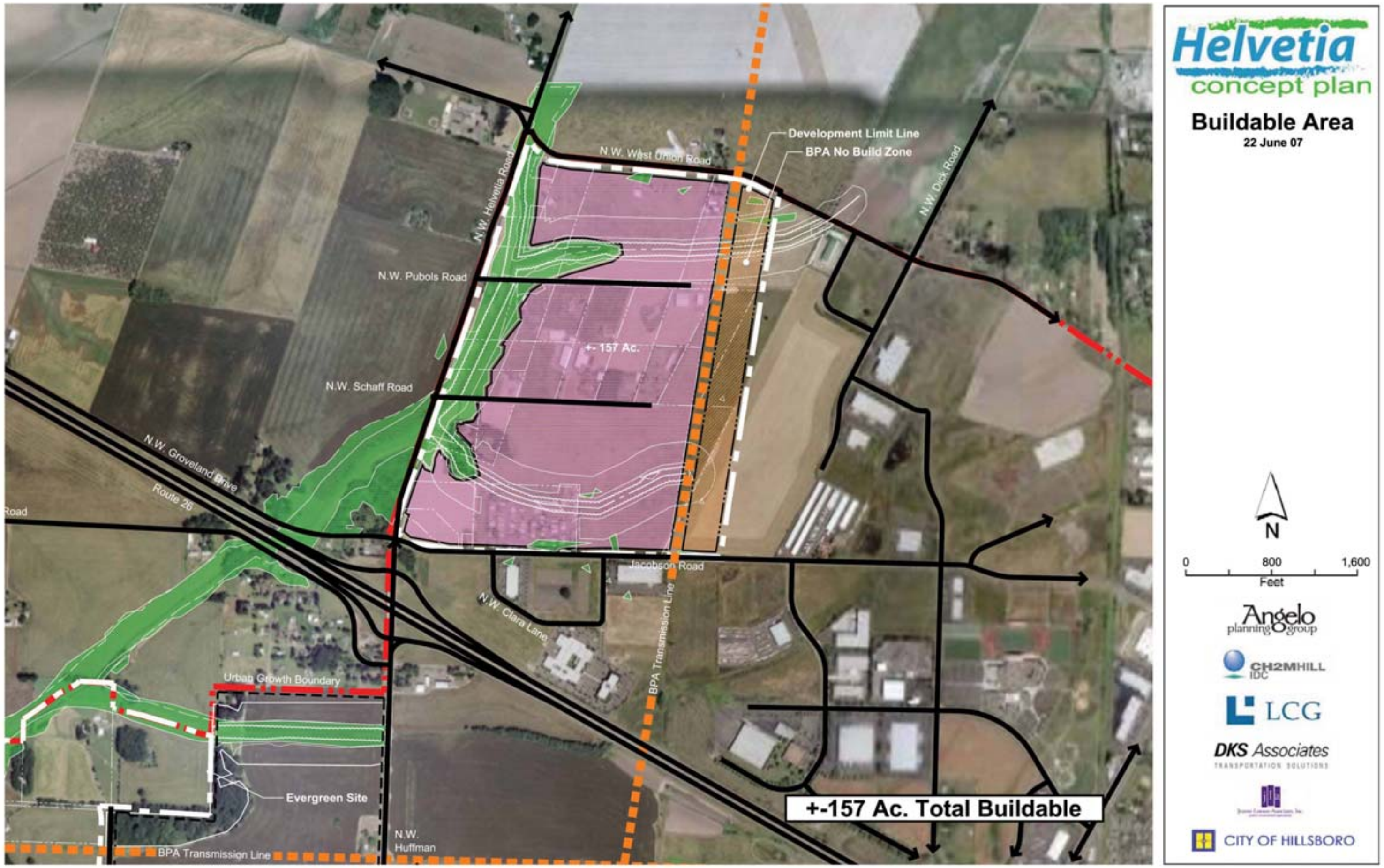
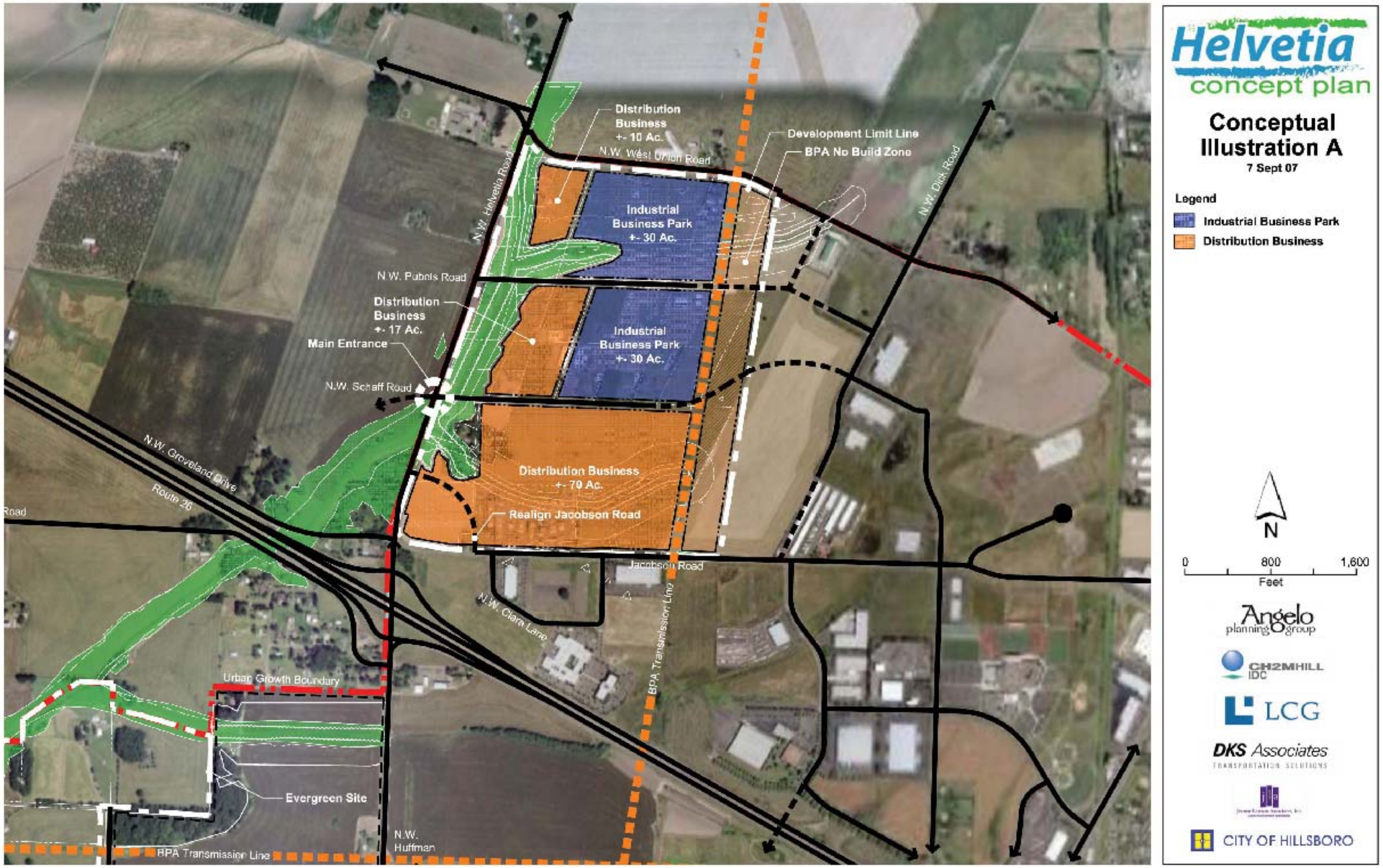
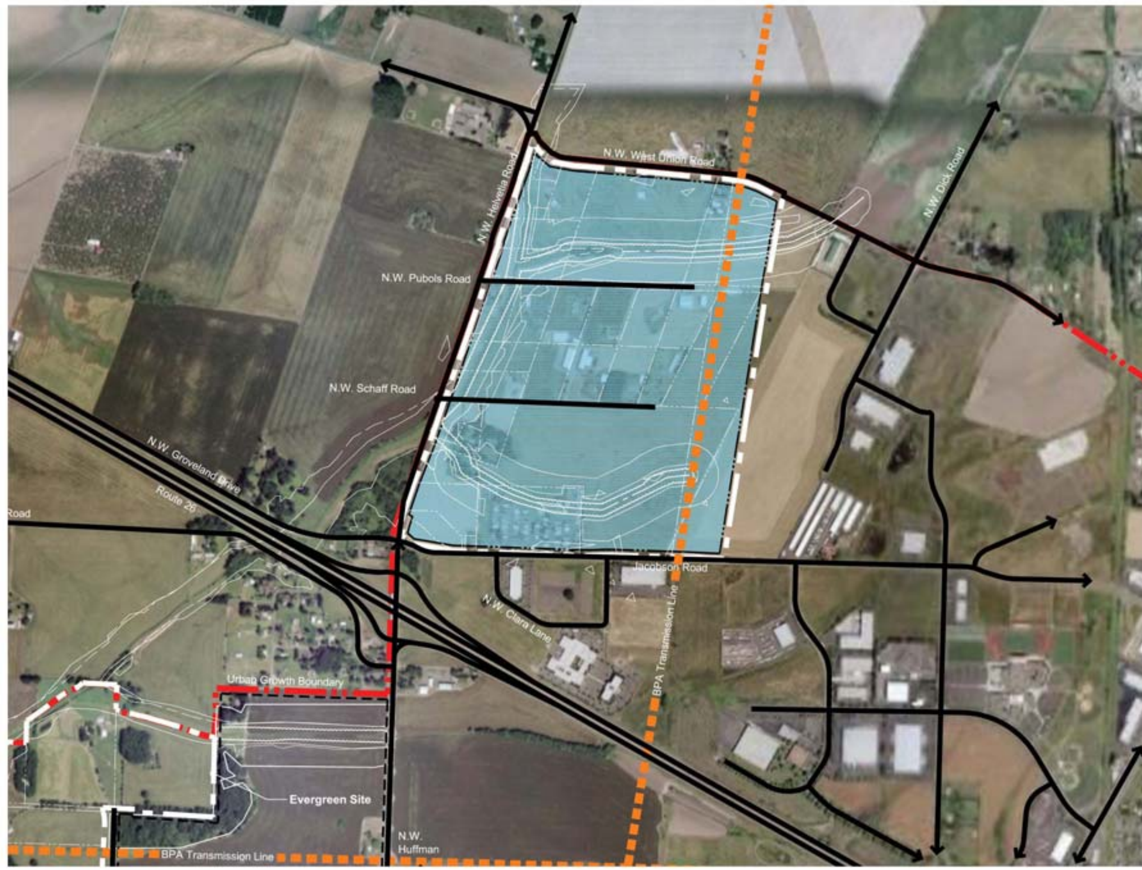


Helvetia Conceptual Illustration



Helvetia Comprehensive Plan Designation



Legend

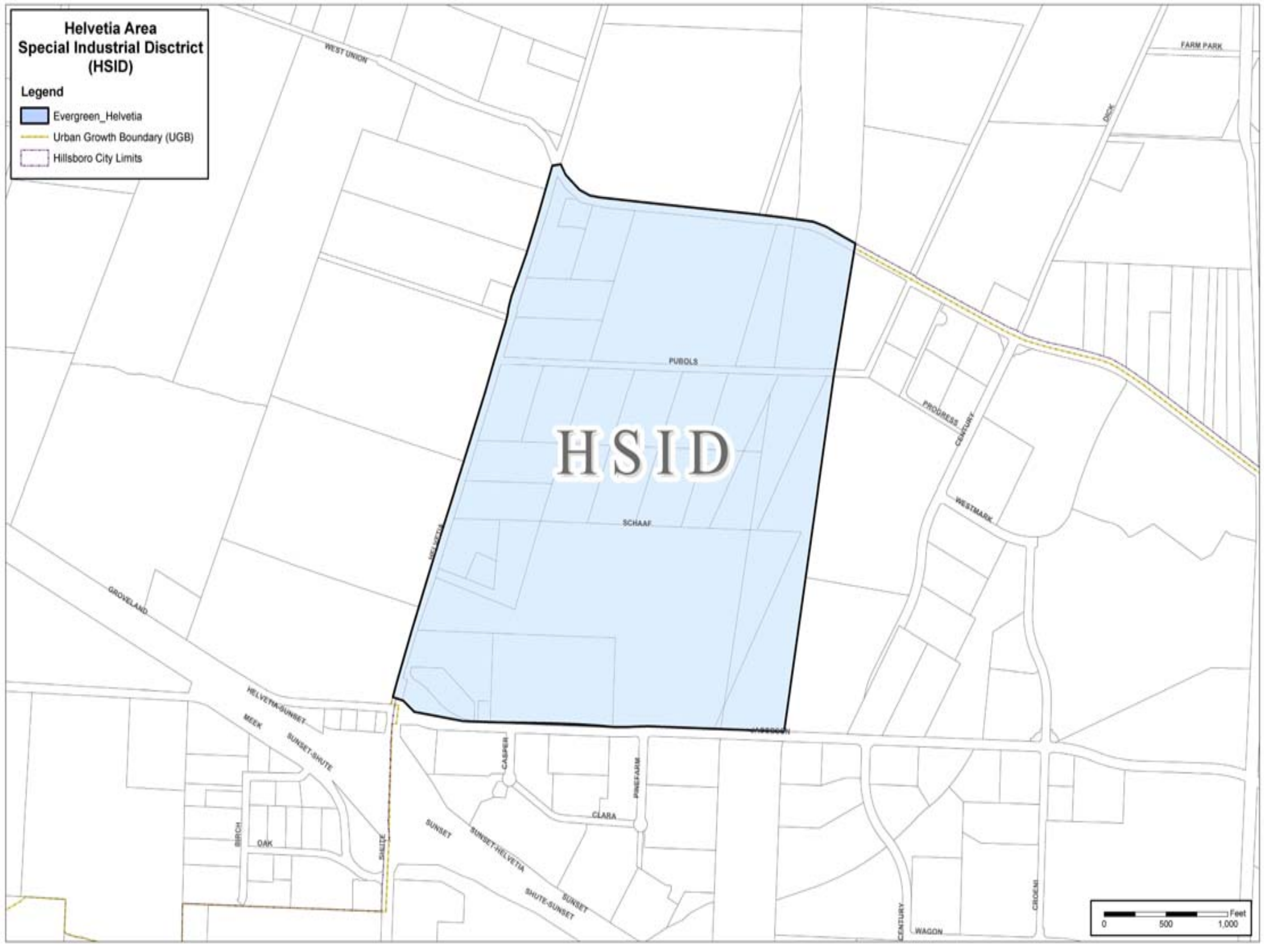
Industrial

Hillsboro Comprehensive Plan

Amend Hillsboro Comprehensive Plan Policies to:

- Add Helvetia Industrial Area Plan Section.
- Enable “Performance-Based” Comprehensive Plan and Zoning Implementation provisions to guide future industrial development.
- Provide sufficient flexibility and authority to insure regulatory responsiveness to changing industrial market trends and opportunities for the Area over time.
- Include:
    - Area Natural Resources Management Plan
    - Area Public Infrastructure (Water/Sewer Systems) Management Plan
    - Area Transportation System Plan

Helvetia Zoning



Helvetia concept plan

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Hillsboro Zoning Ordinance

- Amend Hillsboro Zoning Ordinance to include:

Helvetia Area Special Industrial District (HSID)

- 10 acre minimum lot size
  - Lots of record smaller than 10 acres may contain any use approved for Helvetia
  - Future subdivision of properties allowed as long as one 10 acre lot is created and remaining lot(s) contain one parcel of 5 acres
- Wide list of permitted development types
- Commercial matches Metro's Title 4 limitations

Hillsboro Zoning Ordinance

Helvetia area permitted development types:

(1) Sustainable, Environmental, and Energy Businesses

(2) Biotech Campus

(3) Industry Research & Development (R&D) Parks

(4) Industrial Incubators, Start-ups and Spin-offs Business Parks

(5) Distribution Businesses

(6) Industry Suppliers

(7) Support Commercial Services

(8) Transportation facilities

(9) Public service or utility uses and facilities

(10) Other uses - as determined by Planning Director (on properties < 25 acres) or Planning Commission (on properties ≥ 25 acres)

Next Steps/Discussion

- Planning Commission Workshop – November 1st
- Planning Commission Hearing – November 14th
- City Council Hearing – December 4th

<u>Project Contacts</u>

Project Website: www.evergreen-helvetia.org

Patrick Ribellia: City of Hillsboro
503.681.6481
patrickr@ci.hillsboro.or.us

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Appendix E

Economic Trends Workshop Summary

Economic Trends Workshop

Monday, February 26, 2007
8:15 am - 4:30 pm

Hillsboro Civic Center Auditorium

Sponsored by:

City of Hillsboro

APG Angelo planning group

Economic Trends Workshop

Since the early 1990s the City of Hillsboro has attracted industrial businesses to the City and Portland Region and expanded traded and local business sectors' economic productivity and opportunities throughout the community.

The growth in Hillsboro of a high technology industry cluster, anchored and led by the multiple Intel campuses and driven also by good business access to a large, highly trained and available technology workforce in the community, have made Hillsboro a competitive location for high tech companies seeking U.S. business locations.

The recent decision by Genentech, Inc. to locate a medical products facility in the Shute Road Area demonstrates Hillsboro's competitive high tech location advantage. Much more importantly, it raises an opportunity for Hillsboro (and the Portland Region) to expand its industrial base significantly into the bio-medical field and to attract other established and start-up bio-tech companies.

The Tanasbourne Town Center/AmberGlen area is emerging as a successful concentration of mixed-use activity and employment center in the Greater Portland region.

These achievements came about, in part, through City-Regional collaboration assuring suitable industrial land is available, public services and infrastructure are accessible, private/public partnerships are established and the regulatory environment provides certainty to the community and businesses.

Upcoming concept planning of the Evergreen and Helvetia Industrial Areas (almost 800 acres) coupled with the availability of much of the Shute Road Industrial Area (100 plus undeveloped acres) requires continuing that collaboration. More important, it provides a timely opportunity to evaluate and define (or refine) the direction of future industrial growth within the City and our Industrial Sanctuary (now roughly 2600 acres in size) which contains a major economic engine of the Portland Region and State.

This Economic Trends Workshop will examine future economic opportunities Hillsboro may have and the state, regional and local economic, land use and infrastructure policies and actions needed to take advantage of these opportunities.

Agenda

8:15 am – 8:30 am................I. WELCOME & INTRODUCTIONS
Mayor Tom Hughes

8:30 am – 10:30 am....................................II. PANEL #1
National Trends and Local Growth In Established And Emerging Traded Sector Industry Clusters

10:30 am – 10:45 am ....BREAK

10:45 am – 12:15 pm .... III. PANEL #2
Industrial Start-Ups, Incubators And Spin-Offs - Potential Traded Sector Growth Segments In Washington County

12:15 pm – 12:45 pm ....LUNCH BREAK

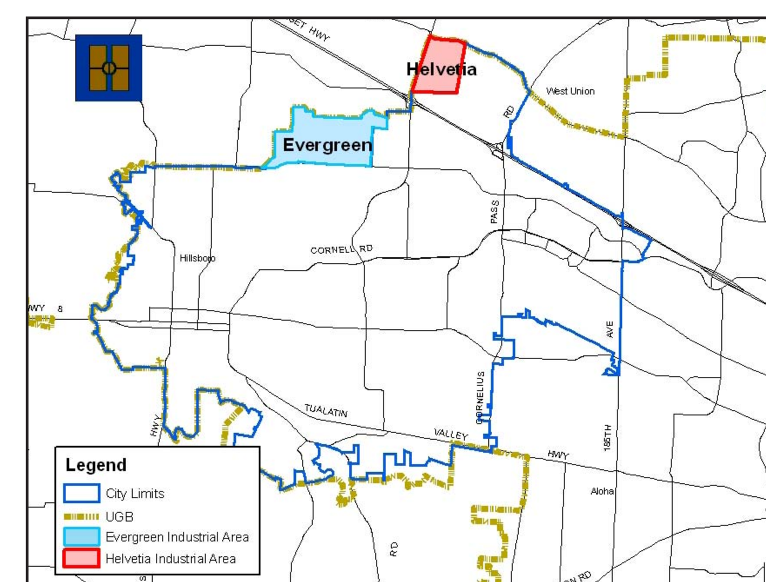
12:45 pm – 2:15 pm .... IV. ROUNDTABLE FORUM
Thoughts, Perspectives and Predictions: Future Trends And Direction Of Established and Emerging Industry Clusters In Oregon And Washington County

2:15 pm – 2:30 pm .... BREAK

2:30 pm – 4:00 pm .... V. PANEL #3
Defining Industrial Development Concepts, Opportunities & Strategies For The Evergreen And Helvetia Areas

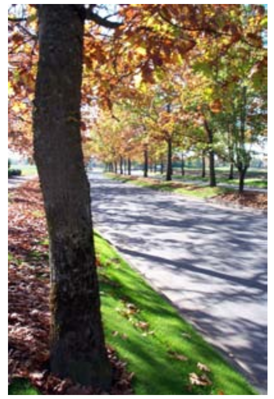
4:00 pm – 4:15 pm .... VI. Wrap-up
Mayor Tom Hughes

Session details on reverse



II. PANEL #1: National Trends and Local Growth In Established And Emerging Traded Sector Industry Clusters

What are the national trends in the following established and emerging traded sector industry clusters? How may these trends impact Oregon, Washington County and Hillsboro? Each panelist will be asked their views about these trends and best recruitment practices, economic and locational strengths and weaknesses, and future growth potential for the following established and potentially emerging traded sector industry clusters:



- High Technology (including software, silicon/ semiconductors, open display technology & systems, electronic and computer equipment, material suppliers, information and design services, communication products)
- Nanotechnology
- Environmental Technology
- Bio-medical Research & Devices
- Nano-science and Micro-technology
- Distribution & Logistics

Panelists (facilitated by **Larry Pederson -** Hillsboro Economic Development**):**

- **Joe Cortright**, - Impresa, Inc.
- **Roy Williams** - Oklahoma Chamber of Commerce
- **Bo Carson** - North Carolina Research Triangle
- **Carol Coletta** - CEOs for Cities Chicago

Discussion Topics:

- What factors and conditions contribute to successful as well as poor economic performance of these clusters? Which cities or regions outside Oregon would Hillsboro have to compete with to attract businesses in these clusters, and how can Hillsboro distinguish itself as a desirable location for these businesses?
- Which regions around the country serve as good models for Hillsboro for a strategy to grow and expand its existing and nascent industry clusters?
- Among these established or emerging industry clusters what is the "Next Big Thing"? Which of the following "community ingredients" must be in place to attract each?
    - o Adequate, accessible, skilled work force,
    - o Research/educational facilities,
    - o Investment capital/financing,
    - o Available and suitable land and land prices,
    - o Housing (executive and worker),
    - o Community "quality of life" factors
    - o Competitive business taxation policies,
    - o Manageable public land use development policies and regulations,
    - o Public / private partnerships,
    - o Other variables/factors.
- How have these clusters matured or evolved in other regions? For each industry cluster, what conditions or ingredients are needed to "upgrade" the industry cluster and maximize its growth potential? At what stage of maturity is Hillsboro in these clusters?

III. PANEL #2: Industrial Start-Ups, Incubators And Spin-Offs - Potential Traded Sector Growth Segments In Washington County

Oregon's high tech industry expanded in large part due to the many spin-offs and related businesses that grew out of a handful of major companies. Recognizing this phenomenon, this panel will discuss how Hillsboro can best lay the foundation for continued growth of startups, spin-offs, and expansions arising from its targeted industry clusters.

Panelists (facilitated by **Larry Pederson,** Hillsboro Economic Development**):**

- **Bob Repine** – OECDD
- **Allen Ally** - Governor's Economic Advisor, Chair, Pixelworks, Inc.*
- **Bo Carson -** North Carolina Research Triangle
- **Daniel J. Sweeney -** Chief Operating Office, MathStar (Hillsboro start-up company)
- **Joe Cortright** - Impresa, Inc.
- **Linda Westin -** Oregon Entreprenuers Forum

Discussion Topics:

- What are the defining features that distinguish business "start ups," "spin-offs" and "incubators"? Do these emerging business types have distinctive and common business development needs and requirements? What are they, particularly those relating to land use and development?
- What factors, conditions or demands need to exist within any of the established industry clusters covered in Panel #1 to spur the formation of new business start-ups, spin-offs and incubators in that cluster?
- What role do smaller businesses (i.e. start-ups, spin-offs and incubators) play in maintaining the economic health and viability of established industry clusters? What state, regional and local conditions, policies, and practices must be in place to increase competitiveness in recruiting and nurturing new business start-ups, spin-offs and incubators in each of the established and emerging industry clusters covered in the Panel #1 Session?
- Is Washington County today a good location and/or environment for emerging new businesses? How well do conditions in the state, region, and county, including local development and recruitment policies and practices, compete with other parts of the country identified during Panel #1 discussions?

IV. ROUNDTABLE FORUM: Thoughts, Perspectives and Predictions: Future Trends And Direction Of Established and Emerging Industry Clusters In Oregon And Washington County

Roundtable Participants (facilitated by **Larry Pederson,** Hillsboro Economic Development**):**

- **Mayor Tom Hughes** and **Metro Councilor Kathryn Harrington** Co-host, facilitate & moderate Roundtable Discussion.
- **Carol Coletta -** CEOs for Cities
  Ten (10) Trends in Ten Minutes: A quick overview of industry/business trends taking place in some U.S. cities and communities.
- **Wally Van Valkenberg** - Stoel Rives LLP
  What do the Oregon Innovation Plan, Oregon Inc. and the Innovation Council envision regarding the expansion or growth of emerging industry clusters in Oregon and Washington County such as Bio-medical research and devices, Nano-science and Micro-technology?
- **Jill Eiland** - Government Affairs, Intel Inc.
  From the perspective of its industry anchor and flagship, what things can the Oregon, and especially Washington County, governments do to help "significantly upgrade" the high technology cluster and spur industry innovation as recommended by Harvard Professor Dr. Michael Porter at the 2007 Oregon Business Summit?
- **Barry Starkman or Todd Kaufman**, Genentech, Inc. *
  Does Oregon, and particularly Washington County, have enough of the following eight (8) ingredients experts say are needed to build the "critical mass" necessary to cultivate and nurture a strong and unique bio-technology/ bio-medical industry cluster in Washington County (and Oregon): 1) engaged universities with active leadership, 2) entrepreneurial cultures with intensive networking across sectors and industries, 3) access to, or available investment capital, to cover all stages of the bio-tech business cycle, 4) discretionary public and/or private research and development funding, 5) a sufficient workforce and available labor pool, 6) access to specialized facilities and equipment, 7) supportive business, tax and regulatory policies, and 8) patience and long-term perspective?

V. PANEL #3: Defining Industrial Development Concepts, Opportunities & Strategies For The Evergreen And Helvetia Areas

The Evergreen/Helvetia Concept Plan Development Panel will "drill-down" into the information, insights and various conclusions drawn from preceding Panels and Roundtable discussions. Panelists will explore growth possibilities within the Evergreen and Helvetia Areas for businesses within the established and emerging traded sector industry clusters covered in preceding Panel Sessions. Panelists will also be asked how to capitalize upon development opportunities and remove development constraints presented by current public policies and existing conditions specific to each area. Participants will be invited to participate in the discussion.

This interactive work session will be led by the Development Panel with members of the audience.

Panelists:

- **Dick Sheehy** - CH2M/IDC Architects. (Panel moderator)
- **Pam Bake**r – Colliers International
- **David Leland** – Leland Consulting
- **Larry Pederson** – City of Hillsboro Economic Development
- **Roy Williams** - Oklahoma Chamber of Commerce
- **Wink Brooks -** Planning Director, City of Hillsboro

Discussion Topics:

- What kinds of industrial businesses and activities should be the primary focus of land use/development concepts developed for the Evergreen & Helvetia Industrial Concept Plans planning process?
- Describe development opportunities and constraints in the two areas that will inform the formation of industrial development concepts for each area. Specifically, are there regulatory issues that may positively or negatively impact the concept planning process? Suggest measures that should be taken to capitalize upon identified opportunities and remove constraints.
- Identify the "community ingredients" discussed in the first panel that will most shape the concept plans for Evergreen & Helvetia.
- Discuss the public infrastructure requirements that need to be addressed in the concept planning process.
- Discuss the "residential element" of the concept plans (i.e. how to address existing rural residential enclaves within both areas as they convert to industrial use).
- Discuss the regulatory component of the concept planning process (i.e. provide initial guidance on how the concept plans should be translated into City Comprehensive Plan and Zoning Ordinance requirements).

* To be confirmed

CITY OF HILLSBORO

February 15, 2007

For nearly two decades a "Hillsboro Industrial Land Sanctuary" (about 1600 acres) has been the home to Intel and other semiconductor and electronic businesses within Oregon's "Silicon Forest". Recently, Metro added about a thousand rural acres to its UGB for Industrial use next to that sanctuary within the Shute, Evergreen and Helvetia Areas. The City of Hillsboro must now prepare and adopt industrial development concept plans for these recent land additions to Oregon's high tech cluster.

A first step in that planning process is outlined in the enclosed *Evergreen/Helvetia Economic Trends Workshop* Program scheduled for Monday, February 26th at the Hillsboro Civic Center in downtown Hillsboro. Its objective is to identify potential types of businesses that are part of established, as well as emerging, Oregon industry clusters that might suitably locate and succeed within any of the three planning Areas. The *Workshop* program questions will cover various topics about the specific Oregon clusters.

We invite you (and a select list of 60-70 other potential public and business sector "stakeholders" in this Project) to attend and participate in this one-day *Workshop*. We think the business of your company or agency will relate to, or be impacted in some way, by new industrial development in any of the three areas. We hope the *Workshop* will provide a glimpse of what's happening within and outside Oregon in our established and emerging technology-related industry clusters and growth opportunities for particular types of new and existing businesses within each cluster.

As potential "stakeholders" in some of the issues to be covered in *Workshop* discussions, we will encourage invitees to chime in on panel discussions that are relevant to their particular business or public responsibilities. *Workshop* findings, conclusions and ideas will inform the formation of planned industrial land uses and design concepts for a combined Evergreen-Shute Industrial Area and for the Helvetia Industrial Area.

Please join us if you can. A light lunch will be provided for panelists and invitees who confirm their attendance by Thursday, February 22nd by contacting Sheril Brown at 503-681-6139 or sherilb@ci.hillsboro.or.us.

Please contact Patrick A. Ribellia, the manager for this City project, at 503-681-6481 or patrickr@ci.hillsboro.or.us if you have any questions or need additional information about the Workshop. I truly hope you can join us. Thank you for considering this invitation.

Sincerely,

CITY OF HILLSBORO

Tom Hughes

Tom Hughes
Mayor

Enclosure: *Economic Trends Workshop Brochure*

150 East Main Street, Hillsboro, Oregon 97123 - 503/681-6219 - FAX 503/681-6232

EVERGREEN & HELVETIA
Project Memorandum

TO:	Evergreen and Helvetia Project Team
FROM:	Chris Zahas, Leland Consulting Group Dave Leland, Leland Consulting Group Tina Mosca, Leland Consulting Group
DATE:	20 March 2007
SUBJECT:	Observations: February 26th Economic Trends Workshop Project Number: 4692

On Monday February 26, 2007, the City of Hillsboro hosted an Economic Trends Workshop at the Hillsboro Civic Center Auditorium. The Workshop consisted of three panels and a roundtable forum, where experts from the Portland metro region and around the country discussed economic and industry trends from both a local and national perspective. In addition to exploring the economic trends and emerging industry clusters in Washington County, the workshop was intended to inform the upcoming concept planning of the Evergreen and Helvetia Industrial Areas, which comprise nearly 1,000 acres inside the Urban Growth Boundary.

This memo summarizes many of the key findings and themes from the workshop, organized by broad topic categories.

Workforce

On the issue of workforce, two principal themes emerged:

- Baby boomers are retiring and cities must create strategies to bridge the workforce gap resulting from the significant loss of seasoned, educated professionals.

- Metropolitan areas that want to be leaders in the New Economy must create a place that is attractive to young, creative talent.

Several panelists suggested that the biggest workforce problem that metropolitan areas will contend with is the brain drain resulting from the retirement of the baby boom generation. Although many "retired" boomers will continue to participate in the workforce in an alternative capacity (as consultants, founders of business spin-offs, members of corporation board of directors, etc.), cities must find a way to fill the significant gap resulting from the departure of this experienced, educated demographic from the workforce.

Joe Cortright, principal of Impresa, Inc., discussed how metropolitan areas faced with a shortage of skilled, educated workers can remain competitive in the New Economy. He asserted that today's economy is driven by ideas and creativity whereas, in the past, local and regional economies were largely infrastructure dependent and resource-driven. In a nutshell, Cortright's research suggests: "Ideas drive economies; Talent creates ideas; and Quality of life attracts talent." Creative talent will locate to metropolitan areas such as Portland, which offers a high degree of livability and amenities that are attractive to the young, college-educated demographic. According to Cortright's research, Portland ranks high amongst cities that have a high and disproportionately strong attraction to the class of young entrepreneurs and scientists needed to drive the technology industry. Between 1990 and 2000, the Portland Metropolitan Area's 25- to 35-year-old population increased by 30 percent.

Carol Coletta, CEO of CEOs for Cities, summarized the major demographic, lifestyle and choice trends occurring in the United States with regard to the technology industries. She echoed many of the concepts introduced by Joe Cortright, suggesting that cities that want to maintain and build strong economies must create a place that is attractive to young talent, foster connections among individuals and communities as well as businesses and industry, develop competitive strategies built on distinctiveness and differences in consumer behavior and attitudes, and focus on innovation and the ability to take advantage of unexpected opportunities.

Site Planning and Economic Development Strategy

One of the central themes echoed by panelists throughout the day was the importance of maintaining a flexible approach to site planning and development activities. Given the dynamic nature of industry and the global marketplace, industry representatives and economic development professionals, including Genentech's Barry Starkman, the North Carolina Research Triangle's Bo Carson, and Roy Williams of the Oklahoma Chamber of Commerce, emphasized the importance of creating an economic development strategy that is adaptable and responsive to change. By focusing too narrowly, some cities unintentionally eliminate market opportunities. Engaging existing players (e.g., Intel and Genentech) in the site planning process will help ensure that their needs are not jeopardized.

Speaking to the potential demand for the Evergreen and Helvetia Areas, Pam Baker of Colliers International cautioned that there are over 400 acres of land available in the marketplace today that the Evergreen and Helvetia sites would compete with. Therefore, making the sites "ready" for development by providing adequate infrastructure and utilities, establishing an understanding between the City and land owners about the sites' potential, and ensuring that land owners are willing to sell will help improve the marketability of the site.

Among the key factors that influenced both MathStar's and Genentech's decision to locate in Hillsboro is Oregon's single sales factor for corporate excise/income taxes, which is based 100 percent on sales within the state versus the amount of corporate sales, payroll, and property within the state.[1] When asked how the City should approach planning for the Evergreen and Helvetia Areas, Barry advised that the City maintain a "campus-type environment" similar to Intel's Ronler Acres campus. Other industry experts suggested that Hillsboro's strong high-tech workforce, affordable housing and quality of life influenced their location decision. Accordingly, as it plans for the future development of the Evergreen Helvetia Areas, the City must take steps to sustain the quality of life that currently attracts employers and workers to the area.

Dave Leland pointed out that negotiating the purchase of properties in the Evergreen and Helvetia Areas will pose a significant challenge to the City. Given current ownership patterns, the City will need to facilitate deals with multiple, fragmented landowners. At this time, neither the City nor Metro nor any other public agencies have the funds to acquire the land. In addition to steep land acquisition costs, the cost of extending infrastructure and utilities to the sites and constructing off-site improvements will be significant. In light of these fiscal and policy challenges, the City may want to consider attracting a major developer into the property as early as possible to acquire it, assist with the development plan, and become the primary implementer of the project.

Target Industries

Genentech's recent purchase of a 100-acre site adjacent to the Evergreen site, where it will construct a new facility that will employ as many as 300 workers by 2009, has increased dialogue around the Evergreen and Helvetia sites' potential to attract biosciences companies. Despite local policymakers and public leaders cautious optimism about Hillsboro's prospects of capturing a piece of the biosciences industry, Joe Cortright advised that Portland is unlikely to attract biosciences employers. Compared to Boston, Philadelphia, the North Carolina Research Triangle area, and a handful of other cities and regions with existing biotech hubs, Portland does not have the critical mass of higher education research institutions and currently receives only a fraction of federal funding available for biosciences research.

Joe suggested that Hillsboro and the Portland region would be better off focusing economic planning efforts on the emerging Sustainable/Environmental Industries cluster, including businesses such as SolarWorld. Coincidentally, during the same week that the Economic Trends Workshop was convened, SolarWorld announced its plans to invest nearly $400 million to expand and develop its new facility, which it recently acquired from the Komatsu Group, and shift its solar crystallization activities from Vancouver to Hillsboro.

[1] *According to a fact sheet on the cost of doing business in Oregon published by the Oregon Economic and Community Development Department, the single sales factor is very advantageous to new/expanding manufacturers and companies that export value-added goods or services outside of Oregon to customers where the corporation is otherwise subject to income taxation.*

Economic Development from a Regional Perspective

Moving forward, partnerships and collaboration will be essential to the success of economic development efforts undertaken by the City of Hillsboro and the Portland Metro region. Following a regional, collaborative approach to the delivery of services versus an approach where local jurisdictions compete against each other will help strengthen the economic position of metropolitan areas. Cities and regions must determine their competitive advantages and develop a "regional mindset" where industry, government and academia collaborate and maintain a high level of responsiveness and flexibility. Pursuing economic development strategies that are too rigid or narrow in scope makes it difficult to adapt to change.

Appendix F

Development Program

MEMORANDUM

Date:	October 15, 2007
To:	Evergreen / Helvetia Concept Plans Project Team
From:	Chris Zahas, Leland Consulting Group
Re:	Concept Plans Development Program

Introduction

A development program is a narrative and quantitative description of how a property or area should be developed. The programs for Evergreen and Helvetia serve as guides for the consultant team, made up of land planners, architects, traffic engineers, and others, who have responsibility for translating this narrative program into a physical land use, transportation, utility, and amenities plan. The development program describes an overall identity for the project areas including image and attributes to be implemented, how the properties best position to capture the optimum market opportunity, the "brand" for the area, and how the plan unfolds over time. The overall objective is to capture target markets, maintain economically viable conditions, and strengthen prospects for financial success while addressing Metro's and Hillsboro's goals for job creation and place making. This all creates a positive, long-term identity for the community.

The development programs for Evergreen and Helvetia respond to a series of "Big Ideas" that describe the general type of development that the community desires and that is likely to be achieved. Serving as objectives for the planning effort, these Big Ideas become benchmarks against which concept alternatives can be evaluated.

Big Ideas

The Evergreen and Helvetia planning areas are likely to develop in different ways from one another. The "Big Ideas" listed below largely apply to Evergreen, which will serve as the primary employment district between the two areas. However, we expect that the types of growth envisioned at Evergreen will require supporting industrial services and will generate new businesses that cannot be accommodated within the Evergreen boundaries. Helvetia will be a likely location for these support and spin-off businesses. Therefore, while we expect that the character of Helvetia will be different from Evergreen, the growth of the two districts will be closely synchronized.

The Big Ideas that will drive employment growth in Hillsboro, and Evergreen in particular, are described below:

Category	Users	Land/Building
Industry of Today (what we've already got)	Silicon (Intel, solar, display panels)	Large campuses (200 acres, 100 acres, etc.)
Industry of Tomorrow (what Hillsboro is beginning to see)	Medical, pharma, bio (Genentech, OHSU), sustainable energy	Medium campuses (75 acres)
Industry of the Future (what Hillsboro could get someday)	Medical (biochips, merging of industries of today/tomorrow)	Office/flex/R&D space, medium to large single-user campuses
Other components		
Services to support all three paradigms	Software companies, suppliers	Leased space in industrial parks or 10-20 acre single-user sites
Commercial service center	Hotel, bank, food	5 to 10 acres

The ability for Evergreen and Helvetia to actually capture the above industries is driven by Hillsboro's strengths, which have helped it succeed in the past and will continue to attract business in the future. Key among these strengths are:

1. Oregon tax structure and incentives – The Strategic Investment Program, Enterprise Zones, and Oregon's single sales factor for taxes are big incentives and have helped keep and attract companies such as Intel and Genentech.
2. Skilled workforce in silicon and technology – The pool of skilled workers in the technology and silicon industries makes it an attractive location for new industries such as solar that require similar skill sets.
3. Clusters – Most industries flourish when they are near their competitors and related industries. Oregon's high technology clusters keep it attractive for additional growth.
4. Power – Relatively cheap and reliable power from PGE and the BPA is extremely important for many technology manufacturing industries and is something that not all regions in the country can offer.
5. Close to California & Seattle – Hillsboro is within the same time zone as Seattle and California, which makes it convenient for companies whose headquarters are in those locations. Further, Hillsboro is less than two hours by plane from either location, making it even more attractive for expansion.
6. Schedule – Hillsboro has a long track record, probably the strongest in the state, of delivering land and entitlements on short timelines.
7. Quality of life – Oregon's reputed quality of life consistently ranks as a key factor for both employee and business location.

Assumptions

The development programs include a variety of assumptions about the market, the landscape, and implementation:

- The development horizon for the program is the year 2030. This is a different timeline than some other Hillsboro planning documents, including the June 2007 draft housing demand analysis.
- Considerable "land banking" is expected, particularly for large campus users. This has the effect of reducing job density in early years, as land is taken off the market but is left vacant in anticipation of future growth by the property owner.
- Industrial development loses relatively less land to infrastructure and circulation than other land uses due to the larger sizes of parcels. Programs with greater levels of parcelization have lower efficiency rates.
- The floor area ratios (FARs) range from 0.20 to 0.24 for industrial uses and go up to 0.30 for the commercial service centers. Employment density averages two employees per 1,000 square feet of building, with lower densities on distribution parcels (Helvetia only) and slightly higher densities on developer parcels and commercial service centers.[1]
- Job densities will be higher at Evergreen than at Helvetia. More distribution and lower intensity employment will take place at Helvetia.
- Campus development in Hillsboro (e.g., Intel) actually has fairly low employment densities. For example, Intel's Ronler Acres has an average employment density of only 13.8 employees per acre (partially due to land banking for future growth).
- Evergreen is expected to develop at the east end of the study area first, expanding westward over time.
- The development concepts assume eventual urbanization (either as employment, residential, or a town center) to the north of Evergreen, between Waible Gulch and Highway 26.

Development Types

The programs for Evergreen and Helvetia include combinations of development types and parcel sizes. The development types (not all of which appear in each program) are described below:

Sustainable, Environmental and Energy Businesses (50 to 100+ acres): These sites provide locations for major corporate and manufacturing campuses for global companies in the sustainable, environmental, and energy industries. The variety of sizes allows for a range of product development (vertically integrated) as well as supporting corporate office and R&D functions. Potential industries could include those related to solar and silicon manufacturing, wind energy, high technology, and biotechnology.

Biotech Campus (35 to 50+ acres): A biotech campus would provide a medium-sized parcel for a business that would be directly related to Hillsboro's emerging biotech industry.

Industry Suppliers (10 to 20+ acres): Industry supplier parcels provide sites for businesses that provide materials and services in support of the larger industrial users in Evergreen and

[1] FAR of 0.20 and employment density of two employees per 1,000 square feet of building gathered from Metro's *1999 Employment Lands Study*, using averages for the Hillsboro employment subsector. Some of these densities were increased in this analysis to account for a maturing of the Hillsboro market.

elsewhere in Hillsboro. These could include both manufacturers as well as distributors of products that are used in the manufacture of products at other companies. Potential users could include suppliers of test equipment, uniforms and linens, lab supplies, sub-components and circuit boards, and packaging materials.

Industrial Incubators, Start-ups, and Spin-offs Business Parks (12 to 40 acres): These sites would be developed by commercial developers and leased in multi-tenant business and industrial parks. Leased park space is needed for smaller and emerging companies that do not have the capital or desire to be owners or for those that are in a growth mode and want the flexibility to move in the future. Industrial business parks typically have a unifying brand and image, which is controlled by a set of CC&Rs. Some industrial business parks may have a focus on raw industrial space, while others may be more focused on flex buildings that combine office and industrial space. Based on interviews with developers, sites of between 20 and 40 acres are preferred.

Industry Research and Development (R&D) Parks (20 to 30 acres): Similar to the above, industry R&D parks provide flexible development space (either as a single user or multi-tenant) for supporting businesses and spin-offs from Hillsboro's core and emerging technology industries.

Distribution Businesses (10 to 70 acres): Helvetia's location near Highway 26 may make it attractive to warehouse/distribution businesses that have a focus on Washington County. Distributors that have a wider focus will likely choose sites along I-5 instead. Any distributor parcels in Helvetia could easily be reclassified as supplier or developer parcels since the parcel size is the same.

Support Commercial Services (5 to 10 acres): Support commercial services are a key component of most employment centers. A commercial service center provides needed daily services for employees (food, banking, convenience goods) and is an amenity that attracts employers to the area. By locating the service center where it will be within walking distance to many employees (yet remaining visible to drive-by traffic), it can also reduce midday traffic trips.

Evergreen Development Programs

The development program for the Evergreen area will provide large parcels to accommodate campuses for Fortune 500 companies and global leaders in cutting-edge industries such as high technology, sustainable and environmental energy, biotech, biomedical, and even industries that have not been invented yet. Supporting these anchor uses at Evergreen will be a range of development sites and smaller campuses to provide space for flex uses, research and development companies, incubator businesses, suppliers, spin-off companies, and other businesses that have a direct connection to the large campus users at Evergreen and in the surrounding area. In order to provide needed amenities for businesses and employees, as well as to reduce trips outside the area, one or two small commercial service centers will also be provided to accommodate uses such as hotels, banks, restaurants, and limited retail.

A unique development program has been prepared for each of the three Alternative Concepts for the Evergreen Concept Plan:

Evergreen Concept A

Evergreen Concept A	Area (acres)	Building Area (s.f.)	FAR	Job Density (empl. per 1,000 s.f.)	Jobs	Jobs per Net Acre
Gross area	534.0					
less infrastructure/circulation (22%)	109.0					
Net development area	425.0					
First Sustainable Energy & Environmental Business	200.0	1,742,400	0.20	2.0	3,485	
Second Sustainable Energy & Environmental Business	100.0	871,200	0.20	2.0	1,742	
Third Sustainable Energy & Environmental Business	65.0	566,280	0.20	2.0	1,133	
Industrial Business Park	40.0	418,176	0.24	2.5	1,045	
Commercial Node (2@ 10 each)	20.0	261,360	0.30	2.5	653	
TOTAL	425.0	3,859,416			8,059	19.0

Evergreen Concept B-1

Item	Area (acres)	Building Area (s.f.)	FAR	Job Density (empl. per 1,000 s.f.)	Jobs	Jobs per Net Acre
Gross area	534.0					
less infrastructure/circulation (16%)	84.0					
Net development area	450.0					
First Sustainable Energy & Environmental Business	70.0	609,840	0.20	2.0	1,220	
Second Sustainable Energy & Environmental Business	45.0	392,040	0.20	2.0	784	
Biotech Campus	105.0	914,760	0.20	2.0	1,830	
Industry Suppliers 1	30.0	274,428	0.21	2.2	604	
Industry Suppliers 2	75.0	686,070	0.21	2.2	1,509	
Industrial Business Park 1	28.0	292,723	0.24	2.5	732	
Industrial Business Park 2	25.0	261,360	0.24	2.5	653	
Industrial Business Park 3	12.0	125,453	0.24	2.5	314	
Industry R & D Parks	40.0	418,176	0.24	2.5	1,045	
Commercial Node (2@ 10 each)	20.0	261,360	0.30	2.5	653	
TOTAL	450.0	4,236,210			9,344	20.8

Evergreen Concept B-2

Item	Area (acres)	Building Area (s.f.)	FAR	Job Density (empl. per 1,000 s.f.)	Jobs	Jobs per Net Acre
Gross area	534.0					
less infrastructure/circulation (18%)	94.0					
Net development area	440.0					
Sustainable Energy & Environmental Business	110.0	958,320	0.20	2.0	1,917	
Biotech Campus	105.0	914,760	0.20	2.0	1,830	
Industry Suppliers	40.0	365,904	0.21	2.2	805	
Industrial Business Park 1	60.0	627,264	0.24	2.5	1,568	
Industrial Business Park 2	40.0	418,176	0.24	2.5	1,045	
Industrial Business Park 3	28.0	292,723	0.24	2.5	732	
Industrial Business Park 4	12.0	125,453	0.24	2.5	314	
Industry R & D Parks	25.0	261,360	0.24	2.5	653	
Commercial Node (2@ 10 each)	20.0	261,360	0.30	2.5	653	
TOTAL	440.0	4,225,320			9,517	21.6

Helvetia Development Program

Unlike Evergreen, Helvetia is expected to be home to more local and regional companies. However, these businesses are expected to provide services and supplies that serve industry at Evergreen in addition to the greater Portland area. For that reason, development at Helvetia is expected to take place at the same time as Evergreen. Helvetia has relatively few options for internal circulation, thus the greatest variable to a development program is the size of parcels. Since the circulation will be relatively fixed, and parcel lines can be moved relatively easily, only a single concept plan was developed for Helvetia. Within that concept, a range of potential use mixes is possible, as expressed in the following table.

Helvetia Concept A

Item	Area (acres)	Building Area (s.f.)	FAR	Job Density (empl. per 1,000 s.f.)	Jobs	Jobs per Net Acre
Gross area	249.0					
less BPA easement	40.0					
less infrastructure/circulation (21%)	52.0					
Net development area	157.0					
Distribution Business 1	70.0	731,808	0.24	0.5	366	5
Distribution Business 2	17.0	177,725	0.24	0.5	89	5
Distribution Business 3	10.0	104,544	0.24	0.5	52	5
Industrial Business Park (2 @ 30 ac.)	60.0	627,264	0.24	2.5	1,568	26
TOTAL	157.0	1,641,341			2,075	13

Appendix G

Transportation Forecasting Documentation

DKS Associates
TRANSPORTATION SOLUTIONS

Memorandum

Draft

TO:	Frank Angelo, Angelo Planning
FROM:	Carl Springer, P.E., Garth Appanaitis
DATE:	October 15, 2007
SUBJECT:	**Helvetia and Evergreen Areas Future Transportation Conditions Analysis** P/A No. P07004-000

The future transportation conditions within the Helvetia and Evergreen Concept Plan area were evaluated to identify how well planned infrastructure can serve these areas, and to identify any additional off-site transportation improvements that would be needed to comply with local performance standards. Traffic forecasts were made for the year 2030, consistent with latest available tools, and an evaluation of traffic operation conditions was done for two cases:

- *2030 without additional development within the two concept plan areas*
- *2030 with full development of the two plan areas, based on the latest land use and site plan concepts*

The 2030 land use and travel forecasts include 10 more years of growth than was previously considered in the most recent Transportation System Plans adopted by Washington County and the City of Hillsboro. Most importantly, these additional 10 years of growth, per the current comprehensive plans, will likely require additional improvements regardless of any development in the concept plan areas. System improvements were divided into two groups, those required to support background development up to 2030, and the added increment of capacity needed to serve the Concept Plan areas. Planning level cost estimates were prepared for transportation improvements identified in this analysis.

Traffic Forecasting

Travel forecasts were prepared using the land use and transportation data contained in the Metro 2030 model with Financially Constrained network improvements. There are many on-going planning studies within Washington County area that could influence the outcome of this study. The land use assumptions within the Evergreen and Helvetia Concept Plan areas were determined by the project team, using employment densities from similar developments in the county. Land use assumptions for the two scenarios are listed in Table 1 for each of these areas.

Table 1: 2030 Land Use Assumptions

Development Area	Regional Traffic Analysis Zones	2030 Without New Development in Concept Plan Areas	2030 With Full Development in Concept Plan Areas
Evergreen Road Concept Plan	1237, 1246, 1249	73 households 1673 employees	0 households 9,268 employees
Helvetia Road Concept Plan	1240	80 households 993 employees	0 households 3,426 employees
Source: Leland Consulting Employment levels within the Concept Plan areas assumed 17.3 employees per acre and 21.3 employees per acres, as recommended by Leland Consulting,			

Other pending growth areas that may influence transportation conditions within this study area include South Hillsboro, Downtown Hillsboro, North Bethany, and the Amberglen area. Metro's current baseline land use allocations for these areas were used in this study without any modifications. No changes were made for two reasons:

1) the Transportation Planning Rule, section 060, requires that a pending Comprehensive Plan change consider only existing Comprehensive Plan uses, aside from the subject site, and is not required to also consider other amendments that are under study but have not been formally adopted.

2) Our review of the other four development areas within the 2030 land use allocations made in the Metro forecasts showed that all but one of them is roughly similar to the development levels currently under study.

Specifically, North Bethany already has about 5,000 households assumed, South Hillsboro has about 5,500 households and downtown Hillsboro has about same units and employment levels, just re-arranged in different sectors of the downtown. Only the Amberglen area seemed to be significantly underestimated, relative to current plans being considered.

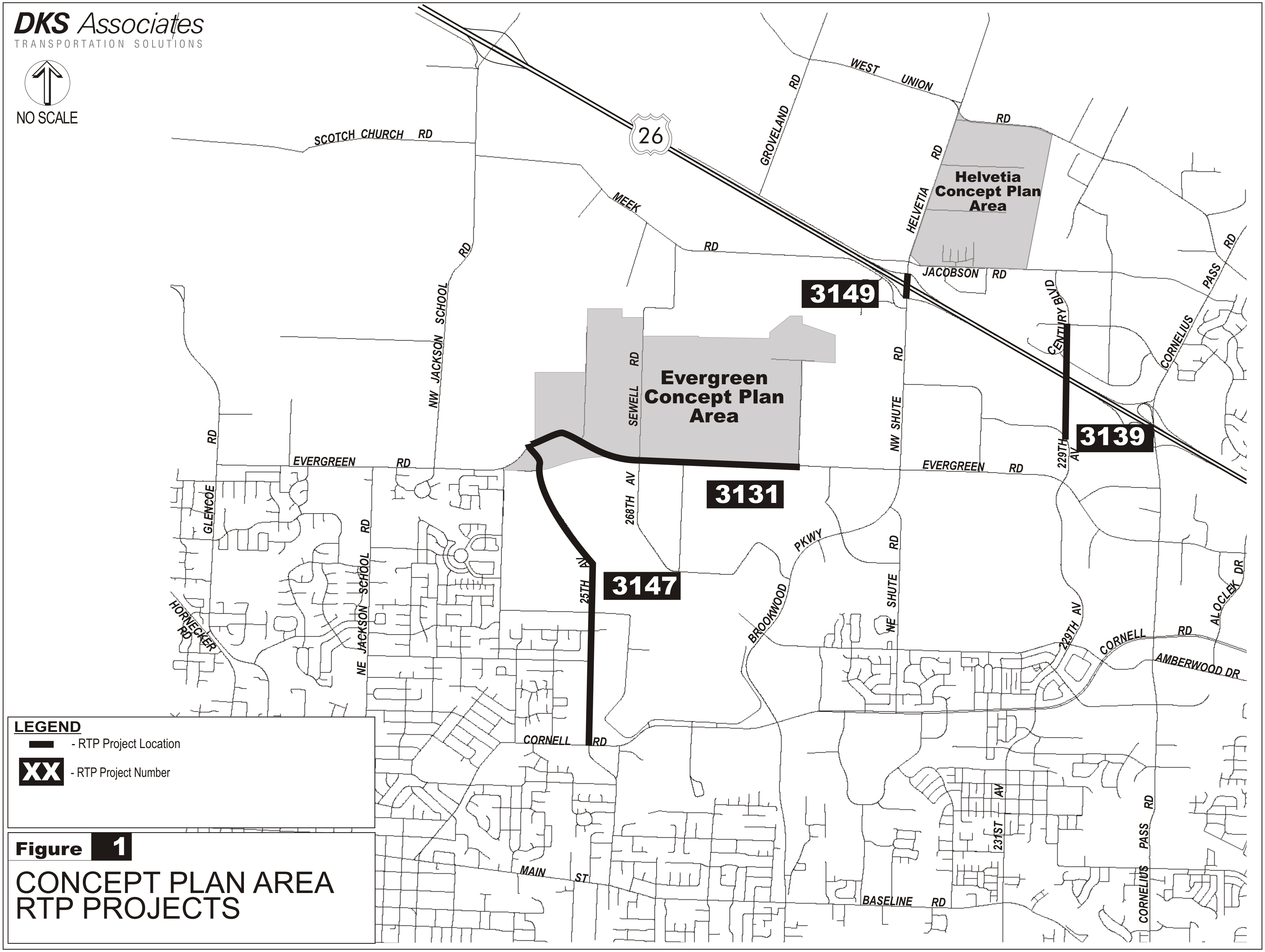
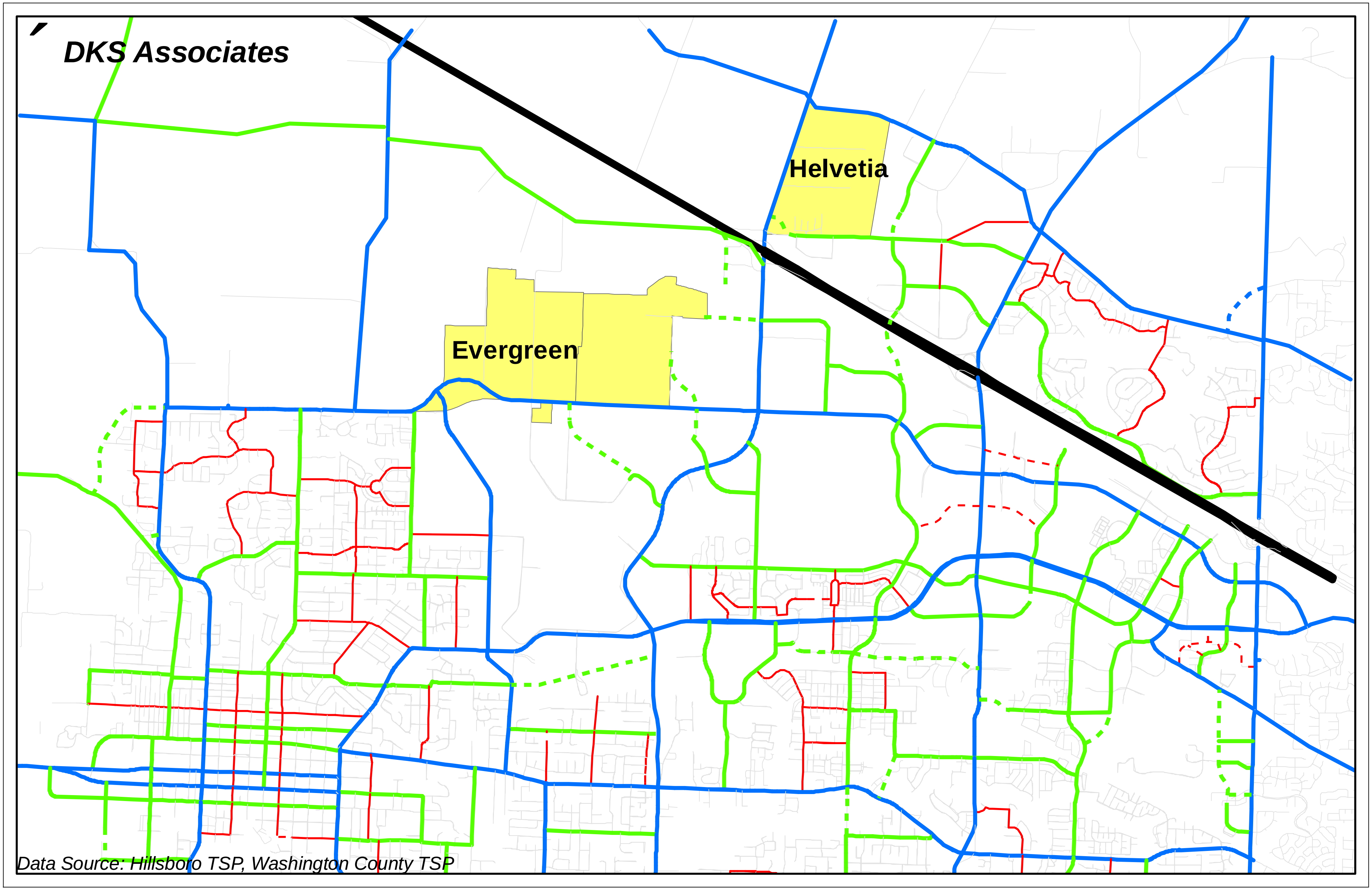


Figure 1

CONCEPT PLAN AREA RTP PROJECTS



LEGEND

Functional Class

- Freeway
- Arterial
- Future Arterial
- Collector
- Future Collector
- Neighborhood Route
- Future Neighborhood Route
- Local
- Project Area

0 4,000 8,000 Feet

SCALE: 1" = 4000'

FIGURE 2
Roadway Functional Class

Transportation Network Improvements

The projects assumed to be constructed from the Regional Transportation Plan list by 2030 included those listed in Table 2A below. These projects are referred to as "Financially Constrained", since they have been identified by the responsible lead agency as a priority, and they have been included in the adopted Federal Regional Transportation Plan list, as of 2004.

Table 2A: 2030 Financially Constrained RTP Projects within Study Area

2004 RTP Project No.	Project Location	Description of Improvement	Estimated Construction Cost (2004)
3149	Shute Road / US 26 Interchange	Relocate westbound on-ramp to construct westbound to southbound loop ramp and widen overcrossing to accommodate additional southbound through lane	$29.3 Million*
3131	Evergreen Road 25th Avenue to 253rd Avenue	Widen to five lanes including sidewalks and bike lanes	$4.7 Million
3139	US 26 Overcrossing - Sunset IA NW Bennett Avenue to NW Wagon Way	Construct two-lane new overcrossing with sidewalks and bike lanes to better connect areas north and south of US 26	$6.6 Million
3147	25th Avenue Improvements Cornell Road to Evergreen	Widen street to three lanes with bike lanes	$2.5 Million

** Revised cost based on current RTP update for project 10600. Prior cost estimate was $6.3 million.*

Metro is currently updating this list (see Table 2B, next page). One of the key improvement projects within the study area is the Shute Road interchange at US 26. This project has been expanded to include re-aligned frontage roads on the north side of the highway, and has a new cost estimated at $29 million (2007 dollars). This project is currently on the 100% funded list of the RTP update project list. Figure 1 shows the location of the RTP projects that were included. Figure 2 shows the functional class of facilities in the area.

The Regional Transportation Plan is being updated now, and the list of regional projects in the area has changed since the previous effort. Table 2B lists the project contained in the most current RTP list, which is referred to as 100% funded list of projects. There are three projects of note in Table 2B. The Evergreen Road widening along the project frontage is listed (portions of #10597, 10814) and the Huffman Road extension west of Shute Road (#10821). To further clarify, the list of projects in Table 2B were not necessarily included in the 2030 forecasts used in this analysis, but represent a more current list of projects for the study area.

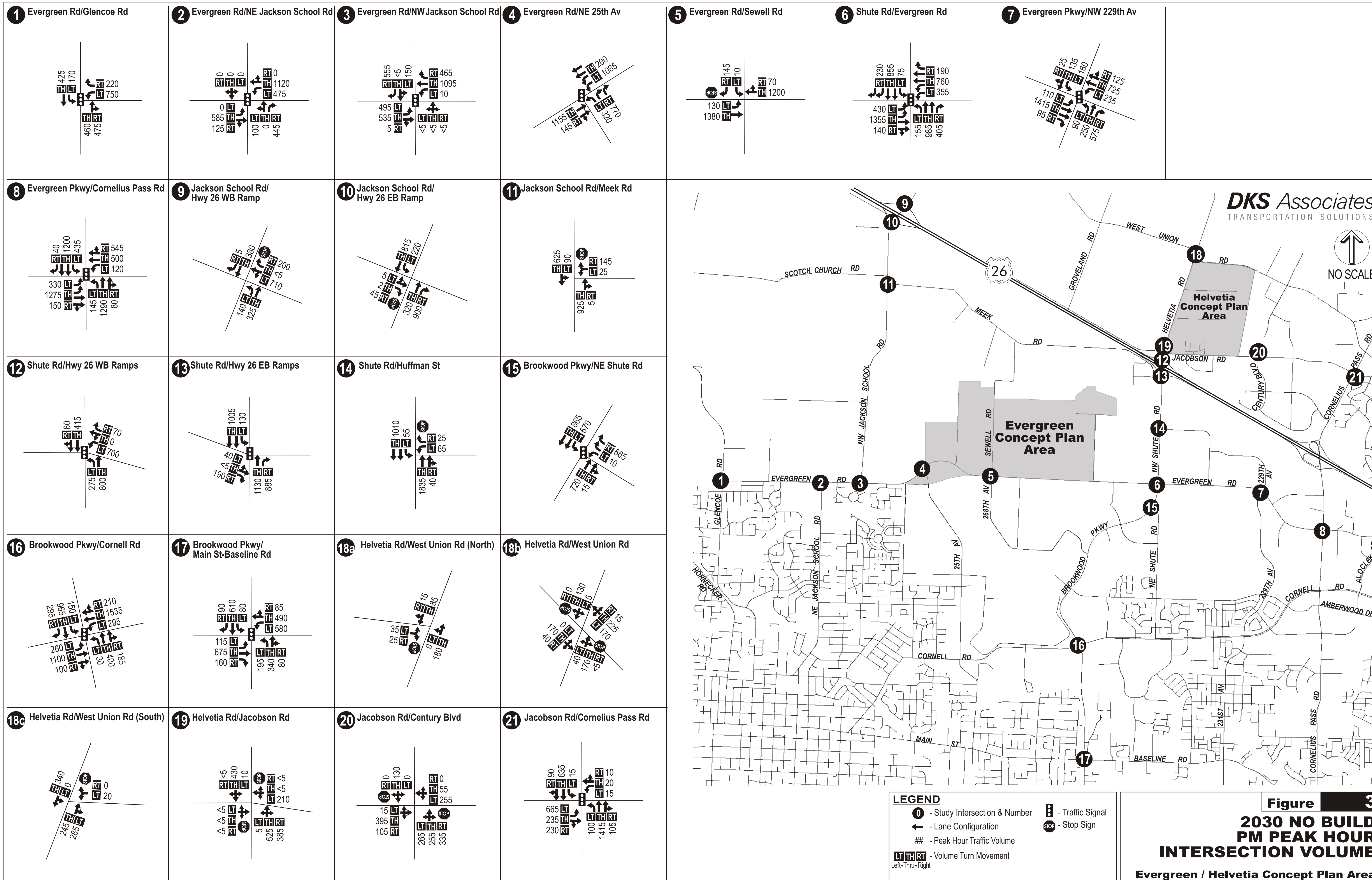
Table 2B: 2035 Financially Constrained Federal RTP Projects within Study Area

2007 RTP Project No.	Project Location	Extent	Description	Estimated Construction Cost (2007)
10597	Evergreen Improvements	253rd to Sewell	Widen to 5 lanes with bike lanes and sidewalks.	$11,242,000
10600	Hwy26 / Shute Interchange	Interchange	Add westbound to southbound loop ramp, additional northbound through lane and relocate Jacobsen intersection.	$29,272,000
10814	Evergreen Improvements	25th to Sewell	Widen to 5 lanes with bike lanes and sidewalks.	$4,000,000
10818	231st/Century	Baseline to Lois	Bridge and 3 lanes with bike lanes and sidewalks	$26,248,000
10819	231st/Century	Baseline to Dogwood	Widen to 3 lanes with bike lanes and sidewalks	$6,800,000
10821	Huffman	Shute to West UGB/Sewell	Build 3 lane with bike lanes and sidewalks	$9,280,000
10822	253rd	Evergreen to North UGB	Build 3 lane with bike lanes and sidewalks	$6,162,000
10831	Century Blvd.	Bennett to West Union Rd.	Extend 2/3 lane with US 26 Overpass, connect existing segments	$12,920,000
10836	Evergreen Rd.	Glencoe to 25th	Widen to 5 lanes with bike lanes and sidewalks.	$5,440,000
10839	Century Blvd. (234th)	Alexander to South UGB	Extend 3 lane road with bike lanes/sidewalks	$11,636,000

Travel Forecasting Adjustments

The increment in traffic volume growth between the 2030 models and 2005 base model was applied to existing intersection traffic counts using NCHRP 255 methodology to produce future volume projections for the No Build and Concept Plan scenarios. The resulting volumes for the 2030 PM Peak Hour No Build and 2030 PM Peak Hour Concept Plan scenarios are shown in Figures 3 and 4, respectively.

Traffic forecasts were made for both the Evergreen Road and Helvetia Road concept plans sites concurrently. That is the full development of both sites was assumed for the purposes of this analysis.


1 Evergreen Rd/Glencoe Rd
2 Evergreen Rd/NE Jackson School Rd
3 Evergreen Rd/NW Jackson School Rd
4 Evergreen Rd/NE 25th Av
5 Evergreen Rd/Sewell Rd
6 Shute Rd/Evergreen Rd
7 Evergreen Pkwy/NW 229th Av
8 Evergreen Pkwy/Cornelius Pass Rd
9 Jackson School Rd/ Hwy 26 WB Ramp
10 Jackson School Rd/ Hwy 26 EB Ramp
11 Jackson School Rd/Meek Rd
12 Shute Rd/Hwy 26 WB Ramps
13 Shute Rd/Hwy 26 EB Ramps
14 Shute Rd/Huffman St
15 Brookwood Pkwy/NE Shute Rd
16 Brookwood Pkwy/Cornell Rd
17 Brookwood Pkwy/ Main St-Baseline Rd
18a Helvetia Rd/West Union Rd (North)
18b Helvetia Rd/West Union Rd
18c Helvetia Rd/West Union Rd (South)
19 Helvetia Rd/Jacobson Rd
20 Jacobson Rd/Century Blvd
21 Jacobson Rd/Cornelius Pass Rd
DKS Associates
TRANSPORTATION SOLUTIONS
NO SCALE
Helvetia Concept Plan Area
Evergreen Concept Plan Area
WEST UNION RD
SCOTCH CHURCH RD
MEEK RD
JACOBSON RD
EVERGREEN RD
CORNELL RD
MAIN ST
BASELINE RD
LEGEND
0 - Study Intersection & Number
- Lane Configuration
- Peak Hour Traffic Volume
LT TH RT - Volume Turn Movement
Left•Thru•Right
- Traffic Signal
- Stop Sign
Figure 3
2030 NO BUILD
PM PEAK HOUR
INTERSECTION VOLUME
Evergreen / Helvetia Concept Plan Area

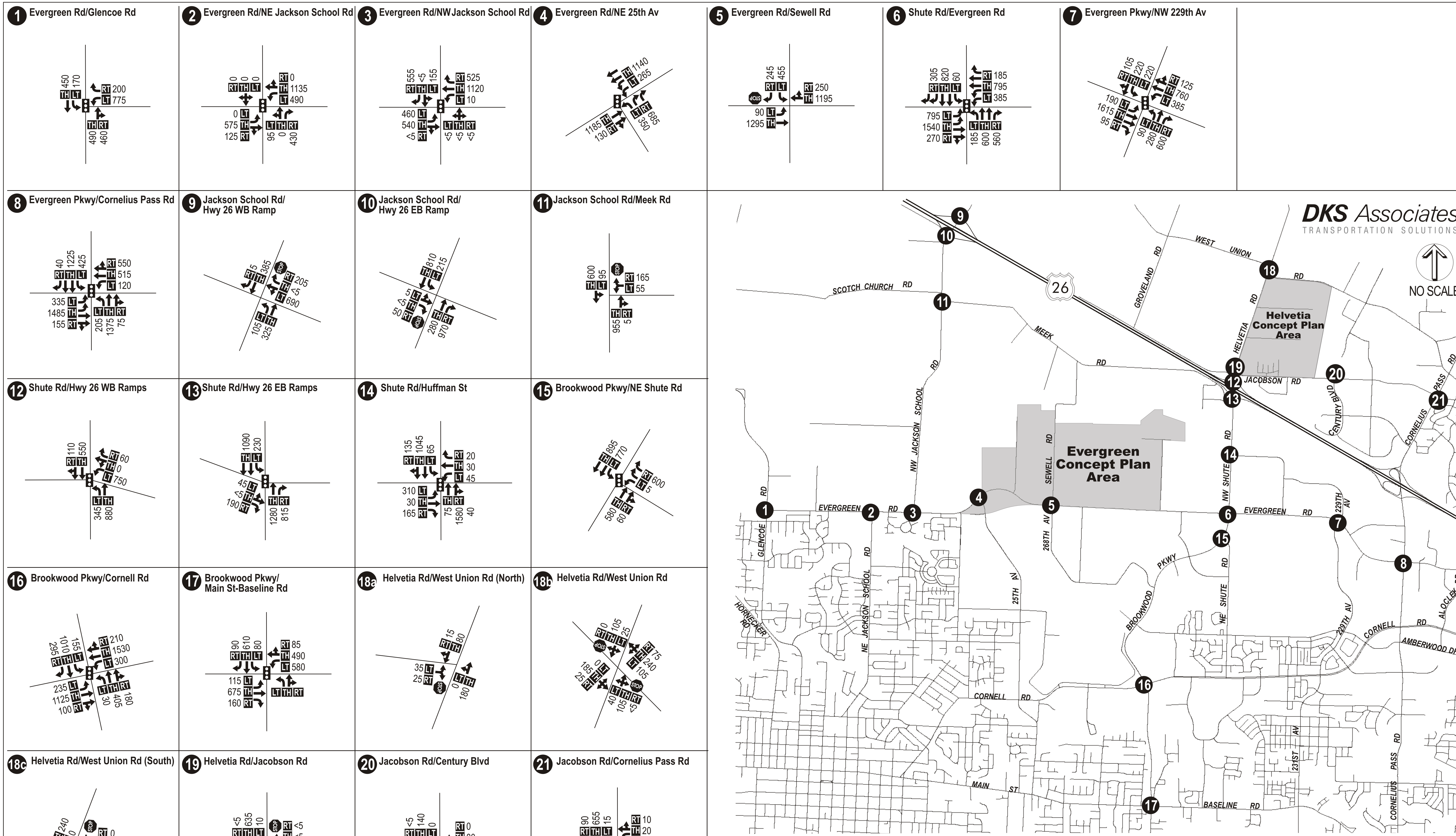


Figure 4
2030 CONCEPT PLAN
PM PEAK HOUR
INTERSECTION VOLUME
Evergreen/Helvetia Concept Plan Area

Transportation System Impacts

Traffic volume alone indicates neither the ability of the street network to carry additional traffic nor the quality of service provided by the street facilities. For this reason, performance measures have been developed to correlate traffic volume data to traffic performance at intersections. Intersections are the controlling bottlenecks of traffic flow, and the ability of a roadway system to carry traffic efficiently is nearly always diminished in their vicinity.

Washington County and the City of Hillsboro measure roadway performance using level of service (LOS) [1]. An intersection's LOS is similar to a "report card" rating, based on average vehicle delay. Highway Capacity Manual[2] (HCM) methodology was used to determine the 2030 PM peak hour intersections operations of the study intersections. Levels of Service A, B and C indicate conditions where vehicles move freely. Levels of service D and E are progressively worse. For signalized intersections, LOS F represents conditions where the average delay for all vehicles through the intersection exceeds 80 seconds per vehicle, generally indicated by long queues and delays. Under this operating condition, delay is highly variable, and it is difficult to estimate average delay accurately because congestion often extends into and is affected by adjacent intersections. Descriptions of levels of service for signalized and unsignalized intersections are contained in the appendix.

Table 3: Minimum Performance Standards

Jurisdiction	Location	Minimum Acceptable Performance Standard (Volume to Capacity Ratio or Level of Service)
ODOT	General Metro Area Rural Area Town Center Area	0.99 not applicable 1.10
Washington County	General Urban Area Rural Area Town Center Area	0.90 0.90 0.99
Hillsboro	All	LOS D

Sources:
Washington County Engrossed Ordinance No. 588, Exhibit 8, Table 5: Washington County Motor Vehicle Performance Measures, October 9, 2002.
Oregon Highway Plan, Maximum Volume to Capacity Ratios Inside Portland Metro Area, Table 7, p. 84, 1999.
Note:
Where capacity improvements are required to mitigate conditions back to acceptable levels on ODOT facilities, the minimum design standards are based on Oregon Highway Design Manual standards, which are lower than the above values.

The minimum transportation performance standards within the study area summarized in Table 3 show a range of acceptable conditions depending on location and facility jurisdiction. The City of Hillsboro has a performance standard of LOS D or better and Washington County has a performance standard of LOS E or better for the peak hour of

[1] Washington County also considers v/c ratio as an intersection performance standard.
[2] *2000 Highway Capacity Manual*, Transportation Research Board, 2003.

traffic. Washington County also requires that intersections operate with a volume-to-capacity (V/C) ratio of 0.90 or better. This ratio indicates what portion of available capacity at an intersection is being utilized. The performance standard for ODOT facilities is a Volume-to-Capacity ratio of 0.99, which is just below being at full capacity. Signalized intersections that require mitigation have a performance standard of 0.75 as provided in the Highway Design Manual. Study intersections were analyzed with and without the addition of project traffic for the 2030 PM peak hour.

Transportation Findings

The transportation findings were developed for the two forecast scenarios. The first section, 2030 No Build Scenario, discusses the 2030 conditions under current zoning, which does not includes significant employment density. The second section, 2030 Concept Plan Scenario, presents the incremental impacts of higher employment levels.

2030 No Build Scenario

The 21 study intersections were analyzed without the addition of project traffic for the 2030 PM peak hour to determine the transportation system improvements that would be required if buildout of the Concept Plan did not occur. Table 4 lists the 2030 PM peak hour intersection performance of the study intersections without the addition of project traffic (2030 No Build). Seventeen of the study intersections would require mitigation in order to meet performance standards. These improvements would be triggered by other growth in the area without the assumed Concept Plan development. These findings indicate that transportation improvements in the area are needed in addition to what was projected in the Washington County and Hillsboro TSPs. The additional improvements account for traffic growth projected to the year 2030, ten years beyond the 2020 TSP projections. Only four study intersections would not require mitigation due to background traffic growth.

Since most of the study intersections would not meet performance standards under the No Build scenario, a number of transportation mitigations would be needed without the Concept Plan. Most of the mitigations are focused on adding capacity at major intersections. A few would involve substantial expansion to existing roadways, and should be considered as part of the Transportation System Plan update for the city. Specifically, the Evergreen Road corridor between Shute Road and Cornelius Pass Road far exceeds planned capacity by 2030. The city will need to consider alternative routes that can add capacity, or expansion of the existing roadway to provide sufficient throughput during peak hours. Alternatively, the city may opt for more aggressive transportation demand management solutions to reduce peak hour demands. For the purpose of this study, it was assumed that expanding the Evergreen Road corridor would be one possible method to meet this need, even though the city would need to officially support this decision at a later time, or select another option.

The transportation mitigation that would be required to meet performance standards for the No Build scenario are listed in Table 5. Projects that are listed in City of Hillsboro TSP, Washington County TSP, MSTIP and RTP are noted. Figure 5 indicates the location of these projects.

Table 4: 2030 PM Peak Hour Intersection Operation Comparison

Intersection	Performance Standard	2030 No Build			2030 with Helvetia and Evergreen Concept Plans		
		Delay	LOS	V/C	Delay	LOS	V/C
ODOT Signalized Intersection Control							
Hwy 26 WB Ramp/NW Shute Rd	v/c = 0.99	26.3	C	0.88	35.1	D	0.96
Hwy 26 EB Ramp/NW Shute Rd	v/c = 0.99	50.3	D	>1.0	>80.0	F	>1.0
ODOT Unsignalized Intersection Control							
Hwy 26 WB Ramp/NW Jackson School Rd	v/c = 0.99	>50.0	A/F	>1.0	>50.0	A/F	>1.0
Hwy 26 EB Ramp/NW Jackson School Rd	v/c = 0.99	47.0	C/E	0.45	44.5	C/E	0.45
Washington County Signalized Intersection Control							
NW Evergreen Rd/NE 25th Ave	LOS E, v/c = 0.90	24.8	C	0.87	24.9	C	0.87
Washington County Unsignalized Intersection Control							
NW Jackson School Rd/NW Meek Rd	LOS E, v/c = 0.90	>50.0	B/F	0.54	>50.0	B/F	0.86
NW Helvetia Rd/NW West Union Rd*	LOS E, v/c = 0.90	37.3	E	0.95	26.5	D	0.84
City of Hillsboro Signalized Intersection Control							
NW Evergreen Rd/NW Glencoe Rd	LOS D	>80.0	F	>1.0	>80.0	F	>1.0
NW Evergreen Rd/NE Jackson School Rd	LOS D	>80.0	F	>1.0	>80.0	F	>1.0
NW Evergreen Rd/NW Jackson School Rd	LOS D	>80.0	F	>1.0	>80.0	F	>1.0
NW Evergreen Pkwy/NE Shute Rd	LOS D	>80.0	F	>1.0	>80.0	F	>1.0
NW Evergreen Rd/NW 229th Ave	LOS D	>80.0	F	>1.0	>80.0	F	>1.0
NW Evergreen Rd/NW Cornelius Pass Rd	LOS D	>80.0	F	>1.0	>80.0	F	>1.0
NW Shute Rd/NE Shute Rd	LOS D	16.9	B	0.76	17.4	B	0.79
NE Brookwood Pkwy/NE Cornell Rd	LOS D	>80.0	F	>1.0	>80.0	F	>1.0
NE Brookwood Pkwy/W Baseline Rd	LOS D	>80.0	F	>1.0	>80.0	F	>1.0
NW Cornelius Pass Rd/NW Jacobson Rd	LOS D	>80.0	F	>1.0	>80.0	F	>1.0
City of Hillsboro Unsignalized Intersection Control							
NW Evergreen Rd/NW Sewell Rd	LOS D	>50.0	B/F	>1.0	>50.0	C/F	>1.0
NW Helvetia Rd/NW Jacobson Rd	LOS D	>50.0	B/F	>1.0	>50.0	B/F	>1.0
NW Shute Rd/NW Huffman St	LOS D	>50.0	C/F	>1.0	>50.0	C/F	>1.0
NW Jacobson Rd/NW Century Blvd	LOS D	>50.0	A/F	>1.0	>50.0	B/F	>1.0

Note:

Shaded values denote that performance standard is exceeded
LOS – Level of Service of signalized intersection, and for major/minorstreet of unsignalized intersection
Delay – Average delay for signalized intersection, and critical movement of unsignalized intersection
V/C – Volume/Capacity Ratio

* *Volume shift and interaction of vehicles would improve operations at intersection*

Table 5: Transportation Mitigations for 2030 No Build Conditions (Without Concept Plans)

	Location	Improvement Item	Planned Project?
1	NW Glencoe Rd/ NW Evergreen Rd	Add a northbound right turn lane	NEW
		Add a northbound right turn overlap	NEW
		Add second westbound left turn lane	NEW
		Add additional southbound receiving lane on Glencoe south of intersection to Milne for dual westbound left turn	NEW
2	NE Jackson School Rd/ NW Evergreen Rd	Add a northbound right turn overlap phase	NEW
3	Evergreen Road	Widen to 5 lane section from NE 253rd-Glencoe *(TSP project)*	Hillsboro TSP
4	New East-West Carrying Capacity	New roadway (or expanded existing roadway) to relieve traffic on Evergreen at Shute Road and Cornelius Pass (*Needs to be considered in TSP update)*	NEW
5	NW Shute Rd/ NW Evergreen Pkwy	Add northbound right turn overlap phase	NEW
6	NW 229th Ave/ NW Evergreen Rd	Add a northbound right turn overlap phase	NEW
		Add a southbound right turn lane	Hillsboro TSP
		Add second northbound right turn lane	NEW
7	NW Jackson School Rd/ NW Meek Rd	Add a single lane roundabout	NEW
8	NW Jackson School Rd/ Hwy 26 WB Ramp	Add a traffic signal	NEW
		Add a second westbound left turn lane	NEW
		Add a second southbound receiving lane on Jackson School south of the intersection	NEW
9	NW Cornelius Pass Rd/ NW Evergreen Pkwy	Add an eastbound right turn lane	Hillsboro TSP
		Add a northbound right turn lane	
		Add second northbound left turn lane	Hillsboro TSP
		Add second southbound left turn lane	Hillsboro TSP
		Add second westbound left turn lane	Hillsboro TSP
		Add westbound right turn lane	Hillsboro TSP
		Add second westbound right turn and overlap	NEW
10	NW Helvetia Rd/ NW Jacobson Rd	Add a traffic signal	NEW
		Add a northbound right turn lane	NEW

	Location	Improvement Item	Planned Project?
11	NW Shute Rd/ Hwy 26 WB Ramp	Add a single lane roundabout	Draft RTP
		Widen structure over Hwy 26 for additional northbound lane (modification to current RTP project)	NEW
12	NW Shute Rd/ Hwy 26 EB Ramp	Add second northbound through lane	NEW
13	NW Shute Rd/ HW Huffman St	Remove trees in median and install two-way left turn lane.	NEW
		Install traffic signal controls.	*Built by Others*
14	NE Brookwood Pkwy/ NE Cornell Rd	Add second eastbound left turn lane	NEW
		Add second westbound left turn lane	NEW
		Add westbound right turn lane	NEW
		Add southbound through lane	NEW
15	NE Brookwood Pkwy/ W Baseline Rd	Restripe to add second eastbound through lane (five lane section east of intersection as TSP project)	NEW
		Add second southbound through lane	NEW
		Add southbound receiving lane south of intersection	NEW
		Add second westbound left turn lane	NEW
16	NW Jacobson Rd/NW Century Blvd	Add a traffic signal	NEW
		Add northbound right turn lane	NEW
		Add northbound right turn overlap phase	NEW
		Add southbound left turn lane	NEW
17	NW Cornelius Pass Rd/ NW Jacobson Rd	Add second eastbound left turn lane	NEW

Implementing the transportation mitigations listed in Table 5 would allow most of the study intersections to meet performance standards for the 2030 PM No Build scenario with one exception:

- *Evergreen Rd/Sewell Rd*

This location does not meet peak hour signal warrants without the inclusion of project traffic on the minor approach. It is expected that adding traffic signal controls would provide sufficient capacity to serve peak hour conditions.

2030 Concept Plan Scenario

The mitigations needed to serve 2030 No Build scenario will provide adequate peak hour service at 16 of the 21 intersections, even with the addition of traffic generated by the Evergreen and Helvetia Concept Plans. Table 6 lists the 2030 PM peak hour performance of study intersections with the addition of project traffic (2030 Concept Plan), assuming all of the improvement listed in Table 5 have already been applied. Notably, this includes a wider section of Evergreen Road between Shute Road and Cornelius Pass Road than is provided in the TSP. Additional mitigations for the 5 locations shaded in Table 6 are identified below.

The forecasted volumes with the Concept Plan scenario cause peak hour conditions to drop below standards at Evergreen Road at Shute Road and Evergreen Road at Cornelius Pass Road. The forecasted demands would require more through capacity east-west than can be provided with the conventional 5-lane cross-section. As mentioned previously, the decision to expand the existing roadway would need to be made through the city's Transportation System Plan update process, however, for the purposes of this study, it was assumed that added capacity was in place to serve No Build forecasts.

The intersection of NW Cornelius Pass Rd/NW Evergreen Rd would meet performance standards for 2030 No Build conditions with the improvements listed in Table 6. However, the intersection would not meet City of Hillsboro performance standards with the addition of Concept Plan traffic. The additional traffic would account for an increase of approximately 400 vehicles (6% of the total entering volume) at the intersection during the PM peak hour.   The intersection would be "built-out" with the improvements listed in Table 6, and additional strategies would need to be considered to address capacity issues.

Potential strategies for the Evergreen Road corridor could include the following:

- Additional east-west facility to relieve traffic volumes on Evergreen Road
- Transportation Demand Management (TDM) program for large employers
- Additional through capacity to Cornelius Pass Road

The City of Hillsboro should focus on solutions for this corridor to serve planned growth that is consistent with the established goals of the Transportation System Plan. Further study is required to identify the best alternative for this location.

Another circulation option was considered for access to the Evergreen Road site to reduce the concept plan traffic loads on Evergreen Road at Sewell Road and Evergreen Road at Shute Road. This would involve a new street connection to Shute Road north of Huffman Road that would provide access to the Evergreen Road site, and the already approved Shute Road Concept Plan site. The new connection allow for a potential re-alignment of Meek Road so that access onto Shute Road could be provided at better safer than under current conditions. This new connection would reduce turning vehicle volumes at the noted intersections, but, upon further review, it was found that these movements are not critical elements to the forecasted heavy congestion. Specifically, the critical movements at Evergreen Road and Shute Road is the westbound left-turn movements versus the heavy eastbound through movement (1500 vehicles per hour). The added connection to Shute

Road north of Huffman Road would relive the opposite approach, the eastbound left-turn, which is not critically congested. So, even though the added connectivity would benefit on-site circulation options, it would not work to alleviate the forecasted severe congestion at Evergreen Road and Shute Road.

Table 6: 2030 PM Peak Hour Intersection Operations with No Build Mitigations

Intersection	Performance Standard	2030 No Build (With Mitigations in Table 5)			2030 Concept Plan (With Mitigations in Table 5)		
		Delay	LOS	V/C	Delay	LOS	V/C
ODOT Signalized Intersection Control							
Hwy 26 EB Ramp/NW Shute Rd	v/c = 0.99	15.7	B	0.58	23.4	C	0.77
Hwy 26 WB Ramp/NW Jackson School Rd	v/c = 0.99	24.3	C	0.65	23.1	C	0.62
ODOT Roundabout Intersection Control							
Hwy 26 WB Ramp/NW Shute Rd	v/c = 0.99	0.7	A	0.68	2.3	A	0.76
Washington County Roundabout Intersection Control							
NW Jackson School Rd/NW Meek Rd	LOS E v/c = 0.99	5.8	A	0.67	6.1	A	0.70
City of Hillsboro Signalized Intersection Control							
NW Evergreen Rd/NW Glencoe Rd	LOS D	22.1	C	0.71	22.8	C	0.74
NW Evergreen Rd/NE Jackson School Rd	LOS D	16.7	B	0.71	17.4	B	0.73
NW Evergreen Rd/NW Jackson School Rd	LOS D	36.5	D	0.93	37.5	D	0.95
NW Evergreen Pkwy/NE Shute Rd	LOS D	50.7	D	0.95	55.7	E	0.99
NW Evergreen Rd/NW 229th Ave	LOS D	49.0	D	0.96	67.4	E	>1.0
NW Evergreen Rd/NW Cornelius Pass Rd	LOS D	51.1	D	0.96	62.6	E	>1.0
NE Brookwood Pkwy/NE Cornell Rd	LOS D	51.7	D	0.97	52.5	D	0.98
NE Brookwood Pkwy/W Baseline Rd	LOS D	43.2	D	0.85	56.3	E	0.92
NW Cornelius Pass Rd/NW Jacobson Rd	LOS D	41.6	D	0.94	44.9	D	0.96
NW Helvetia Rd/NW Jacobson Rd	LOS D	17.6	B	0.80	19.2	B	0.84
NW Jacobson Rd/NW Century Blvd	LOS D	42.5	D	0.84	>0.80	F	>1.0
City of Hillsboro Unsignalized Intersection Control							
NW Evergreen Rd/NW Sewell Rd	LOS D	>50.0	B/F	0.40	>50.0	C/F	0.41
NW Shute Rd/NW Huffman St	LOS D	9.3	A	0.75	34.2	C	0.88

Note:

Shaded values denote that performance standard is exceeded
LOS – Level of Service of signalized intersection, and for major/minor street of unsignalized intersection
Delay – Average delay for signalized intersection, and critical movement of unsignalized intersection
V/C – Volume/Capacity Ratio

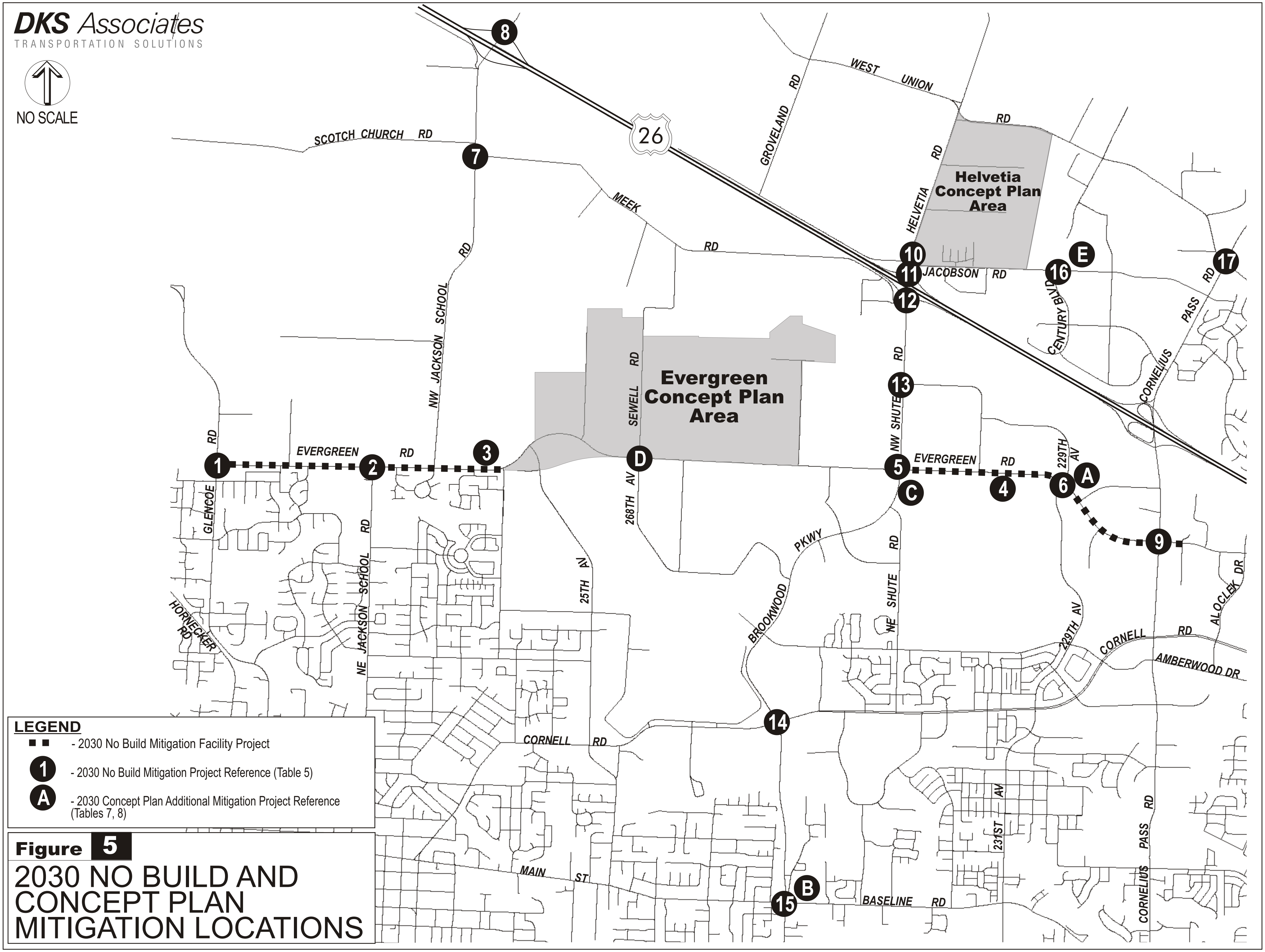


Figure 5

2030 NO BUILD AND CONCEPT PLAN MITIGATION LOCATIONS

Recommended Mitigation Measures

As listed in Table 6, five intersections would require additional mitigation with Concept Plan traffic levels in order to meet performance standards. Potential strategies for NW Cornelius Pass Rd/NW Evergreen Rd were previously discussed. The other locations are:

- NW 229th Avenue/NW Evergreen Road
- NW Schute Road/NW Evergreen Road
- NW Brookwood Parkway/W Baseline Road
- NW Jacobson Road/NW Century Boulevard

In addition to these four locations, one location would fail to meet performance standards under the 2030 No Build scenarios would require a traffic signal. This location is:

- NW Evergreen Road/NW Sewell Road

The additional mitigation required at these locations (assuming mitigation triggered by the No Build scenario is built) in order to meet performance standards is listed in Table 7 and Table 8 for the Evergreen and Helvetia areas, respectively. These improvements are limited to additional turn pockets at the intersections. This type of mitigation would cost approximately $375,000 to $750,000 per location. This planning-level estimate includes potential right of way costs.

Table 7: Additional 2030 Transportation Improvements Needed for Evergreen Concept Plan

	Location	Improvement Item	Planning Cost + ROW*
A	NW 229th Ave/NW Evergreen Rd	Add second northbound left turn lane	$750,000
		Add second southbound left turn lane	$750,000
B	NW Brookwood Pkwy/W Baseline Rd	Add a southbound right turn lane	$375,000
C	NW Shute Rd/NW Evergreen Rd	Add eastbound right turn lane	$375,000
D	NW Sewell Rd/NW Evergreen Rd	Add a traffic signal	$250,000
		TOTAL COST	**$2,500,000**

*Notes: *Assumes additional 50% to project costs for Right of Way.*

Table 8: Additional 2030 Transportation Improvements Needed for Helvetia Concept Plan

	Location	Improvement Item	Planning Cost + ROW*
E	NW Jacobson Rd/NW Century Blvd	Add an eastbound right turn lane	$375,000
		TOTAL COST	**$375,000**

*Notes: *Assumes additional 50% to project costs for Right of Way*

The resulting intersection operations for the 2030 PM Peak Hour Concept Plan scenario with and without these mitigations are listed in Table 9.

Table 9: 2030 PM Peak Hour Concept Plan Intersection Operations

Intersection	Performance Standard	2030 Concept Plan (Without Concept Plan Mitigations)			2030 Concept Plan (With Concept Plan Mitigations)		
		Delay	LOS	V/C	Delay	LOS	V/C
City of Hillsboro Signalized Intersection Control							
NW Evergreen Rd/NW 229th Ave	LOS D	67.4	E	>1.0	52.3	D	0.99
NE Brookwood Pkwy/W Baseline Rd	LOS D	56.3	E	0.92	52.7	D	0.89
NW Jacobson Rd/NW Century Blvd	LOS D	>0.80	F	>1.0	43.2	D	0.91
NW Evergreen Rd/NW Shute Rd	LOS D	55.7	E	0.99	48.2	D	0.92
NW Sewell Rd/NW Evergreen Rd	LOS D	>50.0	C/F	0.41	38.4	D	0.94

***Note:** Shaded values denote that performance standard is exceeded*

LOS – Level of Service of signalized intersection, and for major/minor street of unsignalized intersection
Delay – Average delay for signalized intersection, and critical movement of unsignalized intersection
V/C – Volume/Capacity Ratio

Site Circulation and Access Improvements

Each concept plan site identified new street networks that connect to existing public streets along the frontage. Access spacing standards on Washington County arterials require a minimum separation of 600 feet between adjoining intersections, and recommend one-quarter mile between traffic signals. ODOT has separate access spacing requirements in proximity to the interchange with US 26; specifically, the influence area of the interchange extends 1,320 feet from the nearside ramp terminal, and no new full access intersection should be constructed within that area.

The street improvements associated with the Evergreen Road and Helvetia Road site were evaluated to determine preliminary engineering cost estimates. Most of these improvements are on-site collector roads, and the half-street improvements to the fronting arterial streets. The methodology and unit costs applied to developed these cost estimates were reviewed with Washington County Engineering staff.

Evergreen Road Site

The street improvements for Evergreen Road site include the Huffman Road extension from the Genentech property boundary, and the upgrade of existing Sewell Road to urban county standards. The Huffman Road cross-section should be designed to 3-lanes west of the eastern boundary. From that point to Shute Road, the forecasted traffic volumes will require additional capacity, such as a 5-lane street cross-section.

In addition, the fronting street improvements of Evergreen Road to a full 5-lane section along the site to NW 281st Avenue have been included in the cost estimates. These include right-of-way on-site, street constructions, and conservative assumptions about project design, administration and construction. The total cost for these improvements is $49 million, including the cost for right-of-way. The Evergreen Road improvement should be eligible for System Development Charge credits, since it is a planned improvement in the Washington County Transportation System Plan. Refer to the appendix for cost estimate details.

Table 10: Evergreen Road Site Street Improvements

Street	Extent	Facility Type	Right-of-Way	Construction Costs	Total Cost
Sewell Road	Evergreen Road to Meek Rd.	3-lane Collector	$5,218,184	$6,715,500	$14,375,684
Huffman Road	E. Boundary to W. Boundary	3-lane Collector	$10,282,892	$13,634,500	$23,917,392
Evergreen Road	NW 281st to Meier Jurgen	5-lane Arterial	$3,302,845	$7,515,625	$10,818,470
				$27,865,625	**$49,111,546**

Helvetia Road Site

The street improvements for Helvetia Road site include the upgrading of existing Schaff Road and Pubols Road, and the re-alignment of Jacobson Road to connect with Schaff Road east of its intersection with Helvetia Road. All on-site streets would be collector or local level, with the Jacobson Road facility planned to serve 3-lanes of traffic (one through lane in each direction, with space for left-turn pockets where appropriate). The Pubols Road and Schaff Road street would be industrial class streets built to Washington County industrial standards.

In addition, the fronting street improvements of Helvetia Road to a full 5-lane section from the US 26 Ramps to Schaff Road, and 3-lanes from that point north to West Union Road would be required. Also, West Union Road would be upgraded to urban standards as a 3-lane arterial facility. The cost estimates include right-of-way on-site, street constructions, and conservative assumptions about project design, administration and construction. The total cost for these improvements is $55 million, including the cost for right-of-way. The Helvetia Road and West Union improvement should be eligible for System Development Charge credits, since it is a planned improvement in the Washington County Transportation System Plan.

Table 11: Helvetia Road Site Street Improvements

Street	Extent	Facility Type	Right-of-Way	Construction Costs	Total Cost
Pubols Road	Helvetia Road to E. Boundary	2-lane Collector	$4,106,520	$6,105,000	$10,211,520
Schaff Road	Helvetia Road to E. Boundary	2-lane Collector	$4,355,400	$6,475,000	$10,830,400
Jacobson Road	Helvetia Road to Clara Lane	3-lane Collector	$3,222,996	$4,273,500	$7,496,496
				$16,853,500	**$28,538,416**

Table 12: Helvetia Road Site Frontage Improvements

Street	Extent	Facility Type	Right-of-Way	Construction Costs	Total Cost
Helvetia Road	US 26 Ramps to Jacobson Road (Schaff Road)	Arterial	$612,000	$3,048,780	$10,818,470
West Union Road	Helvetia Road to plan boundary	Arterial	$0	$8,140,000	$8,140,000
Helvetia Road	Jacobson Road (Schaff Road) to West Union Road	Arterial	$0	$6,715,500	$6,715,500
				$17,904,280	**$25,673,970**

Evergreen/Helvetia Conceptual Design Plan
PM Peak Hour
Future No Build Conditions (2030)

Scenario Report

Scenario:	2030 No Build PM Peak
Command:	Default Command
Volume:	Default Volume
Geometry:	Default Geometry
Impact Fee:	Default Impact Fee
Trip Generation:	Default Trip Generation
Trip Distribution:	Default Trip Distribution
Paths:	Default Path
Routes:	Default Route
Configuration:	Default Configuration

Evergreen/Helvetia Conceptual Design Plan
PM Peak Hour
Future No Build Conditions (2030)

Impact Analysis Report
Level Of Service

Intersection	Base LOS	Base Del/Veh	Base V/C	Future LOS	Future Del/Veh	Future V/C	Change in
# 1 NW Glencoe Rd/NW Evergreen Rd	F	201.9	1.533	F	201.9	1.533	+ 0.000 D/V
# 2 NE Jackson School Rd/NW Evergr	F	160.9	1.354	F	160.9	1.354	+ 0.000 D/V
# 3 NW Jackson School Rd/NW Evergr	F	138.9	1.388	F	138.9	1.388	+ 0.000 D/V
# 4 NE 25th Ave/NW Evergreen Rd	C	24.8	0.868	C	24.8	0.868	+ 0.000 D/V
# 5 NW Sewell Rd/NW Evergreen Rd	F	OVRFL	0.000	F	OVRFL	0.000	+ 0.000 D/V
# 6 NW SHute Rd/NW Evergreen Pkwy	F	88.6	1.131	F	88.6	1.131	+ 0.000 D/V
# 7 NW 229th Ave/NW Evergreen Rd	F	96.4	1.205	F	96.4	1.205	+ 0.000 D/V
# 8 NW Cornelius Pass Rd/NW Evergr	F	200.2	1.467	F	200.2	1.467	+ 0.000 D/V
# 9 NW Jackson School Rd/Hwy 26 WB	F	921.1	0.000	F	921.1	0.000	+ 0.000 D/V
# 10 NW Jackson School Rd/Hwy 26 EB	E	47.0	0.000	E	47.0	0.000	+ 0.000 D/V
# 11 NW Jackson School Rd/NW Meek R	F	99.7	0.000	F	99.7	0.000	+ 0.000 D/V
# 15 NW Helvetia Rd/NW Jacobson Rd	F	371.4	0.000	F	371.4	0.000	+ 0.000 D/V
# 16 NW Shute Rd/Hwy 26 WB Ramp	C	26.3	0.878	C	26.3	0.878	+ 0.000 D/V
# 17 NW Shute Rd/Hwy 26 EB Ramp	D	50.3	1.093	D	50.3	1.093	+ 0.000 D/V
# 18 NW Shute/NW Huffman St	F	OVRFL	0.000	F	OVRFL	0.000	+ 0.000 D/V
# 19 NW Shute Rd/NE Shute Rd	B	16.9	0.757	B	16.9	0.757	+ 0.000 D/V
# 20 NE Brookwood Pkwy/NE Cornell R	F	190.7	1.436	F	190.7	1.436	+ 0.000 D/V
# 21 NE Brookwood Pkwy/W Baseline R	F	179.0	1.487	F	179.0	1.487	+ 0.000 D/V
# 22 NW Jacobson Rd/NW Century Blvd	F	OVRFL	0.000	F	OVRFL	0.000	+ 0.000 D/V
# 23 NW Cornelius Pass Rd/NW Jacobs	F	95.3	1.219	F	95.3	1.219	+ 0.000 D/V
#326	E	37.3	0.952	E	37.3	0.952	+ 0.000 V/C

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                  Evergreen/Helvetia Conceptual Design Plan
                               PM Peak Hour
                      Future No Build Conditions (2030)
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                     Level Of Service Computation Report
            2000 HCM Operations Method (Base Volume Alternative)
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Intersection #1 NW Glencoe Rd/NW Evergreen Rd
*********************************************************************************
Cycle (sec):          50              Critical Vol./Cap.(X):         1.533
Loss Time (sec):      12 (Y+R=4.0 sec) Average Delay (sec/veh):       201.9
Optimal Cycle:       180              Level Of Service:                  F
*********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected        Protected        Protected
Rights:           Include          Include          Include          Include
Min. Green:    0     0     0    0     0     0    0     0     0    0     0     0
Lanes:       0  0  0  1  0    1  0  1  0  0    0  0  0  0  0    1  0  0  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      0   462   473   169   427     0     0     0     0   751     0   221
Growth Adj:  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
Initial Bse:   0   462   473   169   427     0     0     0     0   751     0   221
User Adj:    1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
PHF Adj:     0.94  0.94  0.94  0.94  0.94  0.94  0.94  0.94  0.94  0.94  0.94  0.94
PHF Volume:    0   491   503   180   454     0     0     0     0   799     0   235
Reduct Vol:    0     0     0     0     0     0     0     0     0     0     0     0
Reduced Vol:   0   491   503   180   454     0     0     0     0   799     0   235
PCE Adj:     1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
MLF Adj:     1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
FinalVolume:   0   491   503   180   454     0     0     0     0   799     0   235
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1800  1800  1800  1800  1800  1800  1800  1800  1800  1800  1800  1800
Adjustment:  1.00  0.93  0.93  0.95  1.00  1.00  1.00  1.00  1.00  0.95  1.00  0.85
Lanes:       0.00  0.49  0.51  1.00  1.00  0.00  0.00  0.00  0.00  1.00  0.00  1.00
Final Sat.:    0   829   849  1710  1800     0     0     0     0  1710     0  1530
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00  0.59  0.59  0.11  0.25  0.00  0.00  0.00  0.00  0.47  0.00  0.15
Crit Moves:        ****        ****                                ****
Green/Cycle: 0.00  0.39  0.39  0.07  0.46  0.00  0.00  0.00  0.00  0.30  0.00  0.30
Volume/Cap:  0.00  1.53  1.53  1.53  0.55  0.00  0.00  0.00  0.00  1.53  0.00  0.50
Delay/Veh:    0.0   263 263.0 301.3  10.8   0.0   0.0   0.0   0.0 266.9   0.0  15.2
User DelAdj: 1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
AdjDel/Veh:   0.0   263 263.0 301.3  10.8   0.0   0.0   0.0   0.0 266.9   0.0  15.2
LOS by Move:    A     F     F     F     B     A     A     A     A     F     A     B
HCM2kAvgQ:      0    60    60    13     6     0     0     0     0    48     0     4
*********************************************************************************
Note: Queue reported is the number of cars per lane.
*********************************************************************************
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                  Evergreen/Helvetia Conceptual Design Plan
                               PM Peak Hour
                      Future No Build Conditions (2030)
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                     Level Of Service Computation Report
            2000 HCM Operations Method (Base Volume Alternative)
*********************************************************************************
Intersection #2 NE Jackson School Rd/NW Evergreen Rd
*********************************************************************************
Cycle (sec):          60              Critical Vol./Cap.(X):         1.354
Loss Time (sec):      12 (Y+R=4.0 sec) Average Delay (sec/veh):       160.9
Optimal Cycle:       180              Level Of Service:                  F
*********************************************************************************
Street Name:    Jackson School - driveway
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Protected        Protected
Rights:           Include          Include          Include          Include
Min. Green:    0     0     0    0     0     0    0     0     0    0     0     0
Lanes:       0  1  0  0  1    0  0  1! 0  0    1  0  0  1  0    1  0  0  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:     98     0   446     0     0     0     0   586   124   477  1120     0
Growth Adj:  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
Initial Bse:  98     0   446     0     0     0     0   586   124   477  1120     0
User Adj:    1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
PHF Adj:     0.92  0.92  0.92  0.92  0.92  0.92  0.92  0.92  0.92  0.92  0.92  0.92
PHF Volume:  107     0   485     0     0     0     0   637   135   518  1217     0
Reduct Vol:    0     0     0     0     0     0     0     0     0     0     0     0
Reduced Vol: 107     0   485     0     0     0     0   637   135   518  1217     0
PCE Adj:     1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
MLF Adj:     1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
FinalVolume: 107     0   485     0     0     0     0   637   135   518  1217     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1800  1800  1800  1800  1800  1800  1800  1800  1800  1800  1800  1800
Adjustment:  0.71  1.00  0.84  1.00  1.00  1.00  1.00  0.95  0.94  0.93  0.98  1.00
Lanes:       1.00  0.00  1.00  0.00  1.00  0.00  1.00  0.83  0.17  1.00  1.00  0.00
Final Sat.:  1272     0  1515     0  1800     0  1800  1405   297  1676  1764     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.08  0.00  0.32  0.00  0.00  0.00  0.00  0.45  0.45  0.31  0.69  0.00
Crit Moves:              ****                          ****        ****
Green/Cycle: 0.24  0.00  0.24  0.00  0.00  0.00  0.00  0.33  0.33  0.23  0.56  0.00
Volume/Cap:  0.35  0.00  1.35  0.00  0.00  0.00  0.00  1.35  1.35  1.35  1.22  0.00
Delay/Veh:   19.8   0.0 199.4   0.0   0.0   0.0   0.0   190 190.4 198.6   123   0.0
User DelAdj: 1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
AdjDel/Veh:  19.8   0.0 199.4   0.0   0.0   0.0   0.0   190 190.4 198.6   123   0.0
LOS by Move:    B     A     F     A     A     A     A     F     F     F     F     A
HCM2kAvgQ:      2     0    27     0     0     0     0    41    41    29    53     0
*********************************************************************************
Note: Queue reported is the number of cars per lane.
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Evergreen/Helvetia Conceptual Design Plan
PM Peak Hour
Future No Build Conditions (2030)

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

Intersection #3 NW Jackson School Rd/NW Evergreen Rd

Cycle (sec): 60 Critical Vol./Cap.(X): 1.388
Loss Time (sec): 12 (Y+R=4.0 sec) Average Delay (sec/veh): 138.9
Optimal Cycle: 180 Level Of Service: F

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Protected			Protected		
Rights:	Include			Ovl			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0 0 1! 0 0			0 1 0 0 1			1 0 0 1 0			1 0 1 0 1		
Volume Module:												
Base Vol:	2	1	2	151	2	555	496	535	3	9	1095	464
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	2	1	2	151	2	555	496	535	3	9	1095	464
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
PHF Volume:	2	1	2	164	2	603	539	582	3	10	1190	504
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	2	1	2	164	2	603	539	582	3	10	1190	504
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	2	1	2	164	2	603	539	582	3	10	1190	504
Saturation Flow Module:												
Sat/Lane:	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Adjustment:	0.60	0.60	0.60	0.77	0.77	0.82	0.93	0.98	0.98	0.94	0.99	0.82
Lanes:	0.40	0.20	0.40	0.99	0.01	1.00	1.00	0.99	0.01	1.00	1.00	1.00
Final Sat.:	432	216	432	1363	18	1472	1676	1752	10	1693	1782	1482
Capacity Analysis Module:												
Vol/Sat:	0.01	0.01	0.01	0.12	0.12	0.41	0.32	0.33	0.33	0.01	0.67	0.34
Crit Moves:					****		****				****	
Green/Cycle:	0.09	0.09	0.09	0.09	0.09	0.32	0.23	0.70	0.70	0.01	0.48	0.48
Volume/Cap:	0.06	0.06	0.06	1.39	1.39	1.29	1.39	0.47	0.47	0.47	1.39	0.71
Delay/Veh:	25.4	25.4	25.4	244.9	245	164.7	212.7	4.3	4.3	45.6	197	15.5
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	25.4	25.4	25.4	244.9	245	164.7	212.7	4.3	4.3	45.6	197	15.5
LOS by Move:	C	C	C	F	F	F	F	A	A	D	F	B
HCM2kAvgQ:	0	0	0	11	11	31	31	5	5	1	65	9

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

Evergreen/Helvetia Conceptual Design Plan
PM Peak Hour
Future No Build Conditions (2030)

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

Intersection #4 NE 25th Ave/NW Evergreen Rd

Cycle (sec): 80 Critical Vol./Cap.(X): 0.868
Loss Time (sec): 12 (Y+R=4.0 sec) Average Delay (sec/veh): 24.8
Optimal Cycle: 87 Level Of Service: C

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Ovl			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1 0 0 0 2			0 0 0 0 0			0 0 1 1 0			2 0 2 0 0		
Volume Module:												
Base Vol:	317	0	770	0	0	0	0	1155	144	199	1083	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	317	0	770	0	0	0	0	1155	144	199	1083	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
PHF Volume:	345	0	837	0	0	0	0	1255	157	216	1177	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	345	0	837	0	0	0	0	1255	157	216	1177	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	345	0	837	0	0	0	0	1255	157	216	1177	0
Saturation Flow Module:												
Sat/Lane:	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Adjustment:	0.94	1.00	0.74	1.00	1.00	1.00	1.00	0.92	0.92	0.90	0.93	1.00
Lanes:	1.00	0.00	2.00	0.00	0.00	0.00	0.00	1.78	0.22	2.00	2.00	0.00
Final Sat.:	1693	0	2666	0	0	0	0	2959	369	3251	3352	0
Capacity Analysis Module:												
Vol/Sat:	0.20	0.00	0.31	0.00	0.00	0.00	0.00	0.42	0.42	0.07	0.35	0.00
Crit Moves:			****					****		****		
Green/Cycle:	0.28	0.00	0.36	0.00	0.00	0.00	0.00	0.49	0.49	0.08	0.57	0.00
Volume/Cap:	0.71	0.00	0.87	0.00	0.00	0.00	0.00	0.87	0.87	0.87	0.62	0.00
Delay/Veh:	30.7	0.0	32.3	0.0	0.0	0.0	0.0	23.5	23.5	62.7	12.3	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	30.7	0.0	32.3	0.0	0.0	0.0	0.0	23.5	23.5	62.7	12.3	0.0
LOS by Move:	C	A	C	A	A	A	A	C	C	E	B	A
HCM2kAvgQ:	9	0	14	0	0	0	0	20	20	5	11	0

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

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                  Evergreen/Helvetia Conceptual Design Plan
                                PM Peak Hour
                      Future No Build Conditions (2030)
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                     Level Of Service Computation Report
           2000 HCM Unsignalized Method (Base Volume Alternative)
******************************************************************************
Intersection #5 NW Sewell Rd/NW Evergreen Rd
******************************************************************************
Average Delay (sec/veh):     18.2      Worst Case Level Of Service: F[5549.9]
******************************************************************************
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Stop Sign        Stop Sign       Uncontrolled     Uncontrolled
Rights:           Include          Include          Include          Include
Lanes:        0  0  1! 0  0   0  1  0  0  1   1  0  0  1  0   1  0  0  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:        2    0     1    12    0   144   130 1381     4     2 1201    69
Growth Adj:   1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:     2    0     1    12    0   144   130 1381     4     2 1201    69
User Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:      0.92 0.92  0.92  0.92 0.92  0.92  0.92 0.92  0.92  0.92 0.92  0.92
PHF Volume:      2    0     1    13    0   157   141 1501     4     2 1305    75
Reduct Vol:      0    0     0     0    0     0     0    0     0     0    0     0
FinalVolume:     2    0     1    13    0   157   141 1501     4     2 1305    75
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:  7.1  6.5   6.2   7.1  6.5   6.2   4.1 xxxx xxxxx   4.1 xxxx xxxxx
FollowUpTim:  3.5  4.0   3.3   3.5  4.0   3.3   2.2 xxxx xxxxx   2.2 xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: 3211 3171  1503  3134 3135  1343  1380 xxxx xxxxx  1505 xxxx xxxxx
Potent Cap.:     6   11   151     7   11   188   503 xxxx xxxxx   451 xxxx xxxxx
Move Cap.:       1    8   151     5    8   188   503 xxxx xxxxx   451 xxxx xxxxx
Volume/Cap:   2.81 0.00  0.01  2.47 0.00  0.83  0.28 xxxx  xxxx  0.00 xxxx  xxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
2Way95thQ:    xxxx xxxx xxxxx  xxxx xxxx   6.0   1.1 xxxx xxxxx   0.0 xxxx xxxxx
Control Del:xxxxx xxxx xxxxx xxxxx xxxx  79.5  14.9 xxxx xxxxx  13.0 xxxx xxxxx
LOS by Move:     *    *     *     *    *     F     B    *     *     B    *     *
Movement:       LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx    1 xxxxx     5 xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
SharedQueue:xxxxx  1.2 xxxxx   2.7 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shrd ConDel:xxxxx 5550 xxxxx  1952 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS:      *    F     *     F    *     *     *    *     *     *    *     *
ApproachDel:      5549.9            223.5            xxxxxx           xxxxxx
ApproachLOS:         F                F                 *                *
******************************************************************************
Note: Queue reported is the number of cars per lane.
******************************************************************************
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------------------------------------------------------------------------------
                  Evergreen/Helvetia Conceptual Design Plan
                                PM Peak Hour
                      Future No Build Conditions (2030)
------------------------------------------------------------------------------

                     Level Of Service Computation Report
           2000 HCM Operations Method (Base Volume Alternative)
******************************************************************************
Intersection #6 NW SHute Rd/NW Evergreen Pkwy
******************************************************************************
Cycle (sec):          110                Critical Vol./Cap.(X):         1.131
Loss Time (sec):       16 (Y+R=4.0 sec)  Average Delay (sec/veh):        88.6
Optimal Cycle:        180                Level Of Service:                  F
******************************************************************************
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected        Protected        Protected
Rights:           Include            Ovl            Include          Include
Min. Green:      0    0     0     0    0     0     0    0     0     0    0     0
Lanes:        1  0  2  0  1   1  0  2  0  2   2  0  1  1  0   2  0  2  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      154  985   406    74  856   232   431 1353   138   354  760   192
Growth Adj:   1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   154  985   406    74  856   232   431 1353   138   354  760   192
User Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:      0.92 0.92  0.92  0.92 0.92  0.92  0.92 0.92  0.92  0.92 0.92  0.92
PHF Volume:    167 1071   441    80  930   252   468 1471   150   385  826   209
Reduct Vol:      0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:   167 1071   441    80  930   252   468 1471   150   385  826   209
PCE Adj:      1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:      1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:   167 1071   441    80  930   252   468 1471   150   385  826   209
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:     1800 1800  1800  1800 1800  1800  1800 1800  1800  1800 1800  1800
Adjustment:   0.95 0.95  0.85  0.95 0.95  0.75  0.92 0.94  0.94  0.92 0.95  0.84
Lanes:        1.00 2.00  1.00  1.00 2.00  2.00  2.00 1.81  0.19  2.00 2.00  1.00
Final Sat.:   1710 3420  1530  1710 3420  2693  3317 3060   312  3317 3420  1508
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:      0.10 0.31  0.29  0.05 0.27  0.09  0.14 0.48  0.48  0.12 0.24  0.14
Crit Moves:   ****                  ****              ****        ****
Green/Cycle:  0.09 0.28  0.28  0.04 0.24  0.44  0.19 0.42  0.42  0.10 0.33  0.33
Volume/Cap:   1.13 1.10  1.01  1.10 1.13  0.22  0.73 1.13  1.13  1.13 0.73  0.42
Delay/Veh:   163.8 99.9  86.2 188.2  116  19.5  45.7 xxxx 100.0 138.6 34.6  29.0
User DelAdj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:  163.8 99.9  86.2 188.2  116  19.5  45.7 xxxx 100.0 138.6 34.6  29.0
LOS by Move:     F    F     F     F    F     B     D    F     F     F    C     C
HCM2kAvgQ:      11   29    21     6   27     3     9   44    44    13   14     6
******************************************************************************
Note: Queue reported is the number of cars per lane.
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                 Evergreen/Helvetia Conceptual Design Plan
                              PM Peak Hour
                    Future No Build Conditions (2030)
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                   Level Of Service Computation Report
          1994 HCM Operations Method (Base Volume Alternative)
*********************************************************************************
Intersection #7 NW 229th Ave/NW Evergreen Rd
*********************************************************************************
Cycle (sec):          110             Critical Vol./Cap.(X):          1.205
Loss Time (sec):       16 (Y+R=4.0 sec) Average Delay (sec/veh):        96.4
Optimal Cycle:        180             Level Of Service:                   F
*********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|----------------||----------------||----------------||----------------|
Control:        Protected        Protected        Protected        Protected
Rights:           Include          Include          Include          Include
Min. Green:     0     0     0    0     0     0    0     0     0    0     0     0
Lanes:        1  0  1  0  1    1  0  0  1  0    1  0  2  0  1    1  0  1  1  0
------------|----------------||----------------||----------------||----------------|
Volume Module:
Base Vol:       92  249   576   160  134    25   112 1414    94   234  723   127
Growth Adj:   1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    92  249   576   160  134    25   112 1414    94   234  723   127
User Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:      0.95 0.95  0.95  0.95 0.95  0.95  0.95 0.95  0.95  0.95 0.95  0.95
PHF Volume:     97  262   606   168  141    26   118 1488    99   246  761   134
Reduct Vol:      0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:    97  262   606   168  141    26   118 1488    99   246  761   134
PCE Adj:      1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:      1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.05  1.00  1.00 1.05  1.05
FinalVolume:    97  262   606   168  141    26   118 1563    99   246  799   140
------------|----------------||----------------||----------------||----------------|
Saturation Flow Module:
Sat/Lane:     1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:   0.94 0.99  0.84  0.91 0.94  0.94  0.94 0.99  0.84  0.94 0.97  0.97
Lanes:        1.00 1.00  1.00  1.00 0.84  0.16  1.00 2.00  1.00  1.00 1.70  0.30
Final Sat.:   1787 1881  1599  1736 1509   282  1787 3762  1599  1787 3136   551
------------|----------------||----------------||----------------||----------------|
Capacity Analysis Module:
Vol/Sat:      0.05 0.14  0.38  0.10 0.09  0.09  0.07 0.42  0.06  0.14 0.25  0.25
Crit Moves:              ****  ****                  ****        ****
Green/Cycle:  0.15 0.31  0.31  0.08 0.25  0.25  0.09 0.34  0.34  0.11 0.36  0.36
Volume/Cap:   0.37 0.44  1.20  1.20 0.37  0.37  0.70 1.20  0.18  1.20 0.70  0.70
Delay/Veh:    27.9 19.7 146.8 190.5 22.3  22.3  39.2  134  16.3 175.5 20.4  20.4
User DelAdj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:   27.9 19.7 146.8 190.5 22.3  22.3  39.2  134  16.3 175.5 20.4  20.4
DesignQueue:     5   11    28    10    8     8     7   35     4    14   20    20
*********************************************************************************
Note: Queue reported is the number of cars per lane.
*********************************************************************************
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                 Evergreen/Helvetia Conceptual Design Plan
                              PM Peak Hour
                    Future No Build Conditions (2030)
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                   Level Of Service Computation Report
          2000 HCM Operations Method (Base Volume Alternative)
*********************************************************************************
Intersection #8 NW Cornelius Pass Rd/NW Evergreen Pkwy
*********************************************************************************
Cycle (sec):          125             Critical Vol./Cap.(X):          1.467
Loss Time (sec):       16 (Y+R=4.0 sec) Average Delay (sec/veh):       200.2
Optimal Cycle:        180             Level Of Service:                   F
*********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|----------------||----------------||----------------||----------------|
Control:        Protected        Protected        Protected        Protected
Rights:           Include          Include          Include          Include
Min. Green:     0     0     0    0     0     0    0     0     0    0     0     0
Lanes:        1  0  1  1  0    1  0  2  0  1    2  0  1  1  0    1  0  1  1  0
------------|----------------||----------------||----------------||----------------|
Volume Module:
Base Vol:      144 1291    82   437 1198    38   329 1274   149   121  502   546
Growth Adj:   1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   144 1291    82   437 1198    38   329 1274   149   121  502   546
User Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:      0.92 0.92  0.92  0.92 0.92  0.92  0.92 0.92  0.92  0.92 0.92  0.92
PHF Volume:    157 1403    89   475 1302    41   358 1385   162   132  546   593
Reduct Vol:      0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:   157 1403    89   475 1302    41   358 1385   162   132  546   593
PCE Adj:      1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:      1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:   157 1403    89   475 1302    41   358 1385   162   132  546   593
------------|----------------||----------------||----------------||----------------|
Saturation Flow Module:
Sat/Lane:     1800 1800  1800  1800 1800  1800  1800 1800  1800  1800 1800  1800
Adjustment:   0.92 0.91  0.91  0.93 0.93  0.82  0.91 0.93  0.93  0.94 0.87  0.86
Lanes:        1.00 1.88  0.12  1.00 2.00  1.00  2.00 1.79  0.21  1.00 1.00  1.00
Final Sat.:   1660 3094   197  1676 3352  1472  3284 2983   349  1693 1561  1549
------------|----------------||----------------||----------------||----------------|
Capacity Analysis Module:
Vol/Sat:      0.09 0.45  0.45  0.28 0.39  0.03  0.11 0.46  0.46  0.08 0.35  0.38
Crit Moves:        ****        ****                  ****        ****
Green/Cycle:  0.10 0.31  0.31  0.19 0.40  0.40  0.08 0.32  0.32  0.05 0.29  0.29
Volume/Cap:   0.96 1.47  1.47  1.47 0.96  0.07  1.33 1.47  1.47  1.47 1.21  1.33
Delay/Veh:   114.8  259 258.6 276.6 52.3  22.9 230.0  258 257.9 320.0  151 201.8
User DelAdj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:  114.8  259 258.6 276.6 52.3  22.9 230.0  258 257.9 320.0  151 201.8
LOS by Move:     F    F     F     F    D     C     F    F     F     F    F     F
HCM2kAvgQ:       9   61    61    38   31     1    15   64    64    12   37    45
*********************************************************************************
Note: Queue reported is the number of cars per lane.
*********************************************************************************
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                    Evergreen/Helvetia Conceptual Design Plan
                                  PM Peak Hour
                        Future No Build Conditions (2030)
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                       Level Of Service Computation Report
             2000 HCM Unsignalized Method (Base Volume Alternative)
*********************************************************************************
Intersection #9 NW Jackson School Rd/Hwy 26 WB Ramp
*********************************************************************************
Average Delay (sec/veh):    476.1       Worst Case Level Of Service: F[921.1]
*********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Rights:           Include          Include          Include          Include
Lanes:       1  0  1  0  0    0  0  1  0  1    0  0  0  0  0    0  1  0  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:     142  326    0     0  380    5     0    0    0   708    1   201
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:  142  326    0     0  380    5     0    0    0   708    1   201
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.92 0.92  0.92  0.92 0.92  0.92  0.92 0.92  0.92  0.92 0.92  0.92
PHF Volume:   154  354    0     0  413    5     0    0    0   770    1   218
Reduct Vol:     0    0    0     0    0    0     0    0    0     0    0     0
FinalVolume:  154  354    0     0  413    5     0    0    0   770    1   218
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:  4.1 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx   6.4  6.5   6.2
FollowUpTim:  2.2 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx   3.5  4.0   3.3
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol:  418 xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  1079 1082   354
Potent Cap.: 1151 xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx   244  219   694
Move Cap.:   1151 xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx   219  190   694
Volume/Cap:  0.13 xxxx  xxxx  xxxx xxxx  xxxx  xxxx xxxx  xxxx  3.52 0.01  0.31
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
2Way95thQ:    0.5 xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx   1.3
Control Del:  8.6 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx  12.6
LOS by Move:    A    *    *     *    *    *     *    *    *     *    *     B
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx   219 xxxx xxxxx
SharedQueue:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx  72.9 xxxx xxxxx
Shrd ConDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx  1179 xxxx xxxxx
Shared LOS:     *    *    *     *    *    *     *    *    *     F    *     *
ApproachDel:     xxxxxx           xxxxxx           xxxxxx            921.1
ApproachLOS:        *                *                *                F
*********************************************************************************
Note: Queue reported is the number of cars per lane.
*********************************************************************************
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                    Evergreen/Helvetia Conceptual Design Plan
                                  PM Peak Hour
                        Future No Build Conditions (2030)
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                       Level Of Service Computation Report
             2000 HCM Unsignalized Method (Base Volume Alternative)
*********************************************************************************
Intersection #10 NW Jackson School Rd/Hwy 26 EB Ramp
*********************************************************************************
Average Delay (sec/veh):      2.7       Worst Case Level Of Service: E[ 47.0]
*********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Rights:           Include          Include          Include          Include
Lanes:       0  0  1  0  1    1  0  1  0  0    0  1  0  0  1    0  0  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       0  319  902   218  816    0     5    2   45     0    0     0
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    0  319  902   218  816    0     5    2   45     0    0     0
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.92 0.92  0.92  0.92 0.92  0.92  0.92 0.92  0.92  0.92 0.92  0.92
PHF Volume:     0  347  980   237  887    0     5    2   49     0    0     0
Reduct Vol:     0    0    0     0    0    0     0    0    0     0    0     0
FinalVolume:    0  347  980   237  887    0     5    2   49     0    0     0
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:xxxxx xxxx xxxxx   4.1 xxxx xxxxx   6.4  6.5   6.2 xxxxx xxxx xxxxx
FollowUpTim:xxxxx xxxx xxxxx   2.2 xxxx xxxxx   3.5  4.0   3.3 xxxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: xxxx xxxx xxxxx  1327 xxxx xxxxx  2198 2688   887  xxxx xxxx xxxxx
Potent Cap.: xxxx xxxx xxxxx   527 xxxx xxxxx    50   22   346  xxxx xxxx xxxxx
Move Cap.:   xxxx xxxx xxxxx   527 xxxx xxxxx    32   12   346  xxxx xxxx xxxxx
Volume/Cap:  xxxx xxxx  xxxx  0.45 xxxx  xxxx  0.17 0.18  0.14  xxxx xxxx  xxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
2Way95thQ:   xxxx xxxx xxxxx   2.3 xxxx xxxxx  xxxx xxxx   0.5  xxxx xxxx xxxxx
Control Del:xxxxx xxxx xxxxx  17.3 xxxx xxxxx xxxxx xxxx  17.1 xxxxx xxxx xxxxx
LOS by Move:    *    *    *     C    *    *     *    *     C     *    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx    22 xxxx xxxxx  xxxx xxxx xxxxx
SharedQueue:xxxxx xxxx xxxxx xxxxx xxxx xxxxx   1.0 xxxx xxxxx xxxxx xxxx xxxxx
Shrd ConDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx 239.0 xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS:     *    *    *     *    *    *     F    *    *     *    *     *
ApproachDel:     xxxxxx           xxxxxx             47.0           xxxxxx
ApproachLOS:        *                *                E                *
*********************************************************************************
Note: Queue reported is the number of cars per lane.
*********************************************************************************
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                  Evergreen/Helvetia Conceptual Design Plan
                               PM Peak Hour
                      Future No Build Conditions (2030)
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                     Level Of Service Computation Report
            2000 HCM Unsignalized Method (Base Volume Alternative)
*********************************************************************************
Intersection #11 NW Jackson School Rd/NW Meek Rd
*********************************************************************************
Average Delay (sec/veh):      9.9       Worst Case Level Of Service: F[ 99.7]
*********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Rights:           Include          Include          Include          Include
Lanes:       0  0  0  1  0    0  1  0  0  0    0  0  0  0  0    0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       0  926     5    92  623     0     0    0     0    26    0   145
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    0  926     5    92  623     0     0    0     0    26    0   145
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.92 0.92  0.92  0.92 0.92  0.92  0.92 0.92  0.92  0.92 0.92  0.92
PHF Volume:     0 1007     5   100  677     0     0    0     0    28    0   158
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
FinalVolume:    0 1007     5   100  677     0     0    0     0    28    0   158
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:xxxxx xxxx xxxxx   4.1 xxxx xxxxx xxxxx xxxx xxxxx   6.4  6.5   6.2
FollowUpTim:xxxxx xxxx xxxxx   2.2 xxxx xxxxx xxxxx xxxx xxxxx   3.5  4.0   3.3
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: xxxx xxxx xxxxx  1012 xxxx xxxxx  xxxx xxxx xxxxx  1886 1886  1009
Potent Cap.: xxxx xxxx xxxxx   693 xxxx xxxxx  xxxx xxxx xxxxx    78   71   294
Move Cap.:   xxxx xxxx xxxxx   693 xxxx xxxxx  xxxx xxxx xxxxx    69   60   294
Volume/Cap:  xxxx xxxx  xxxx  0.14 xxxx  xxxx  xxxx xxxx  xxxx  0.41 0.00  0.54
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
2Way95thQ:   xxxx xxxx xxxxx   0.5 xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Control Del:xxxxx xxxx xxxxx  11.1 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:    *    *     *     B    *     *     *    *     *     *    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx  197 xxxxx
SharedQueue:xxxxx xxxx xxxxx   0.5 xxxx xxxxx xxxxx xxxx xxxxx xxxxx  7.7 xxxxx
Shrd ConDel:xxxxx xxxx xxxxx  11.1 xxxx xxxxx xxxxx xxxx xxxxx xxxxx 99.7 xxxxx
Shared LOS:     *    *     *     B    *     *     *    *     *     *    F     *
ApproachDel:     xxxxxx           xxxxxx           xxxxxx             99.7
ApproachLOS:        *                *                *                 F
*********************************************************************************
Note: Queue reported is the number of cars per lane.
*********************************************************************************
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---------------------------------------------------------------------------------
                  Evergreen/Helvetia Conceptual Design Plan
                               PM Peak Hour
                      Future No Build Conditions (2030)
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                     Level Of Service Computation Report
            2000 HCM Unsignalized Method (Base Volume Alternative)
*********************************************************************************
Intersection #15 NW Helvetia Rd/NW Jacobson Rd
*********************************************************************************
Average Delay (sec/veh):     50.2       Worst Case Level Of Service: F[371.4]
*********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Rights:           Include          Include          Include          Include
Lanes:       0  0  1! 0  0    0  0  1! 0  0    0  0  1! 0  0    0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       6  524   385     9  429     2     3    1     4   208    1     3
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    6  524   385     9  429     2     3    1     4   208    1     3
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.92 0.92  0.92  0.92 0.92  0.92  0.92 0.92  0.92  0.92 0.92  0.92
PHF Volume:     7  570   418    10  466     2     3    1     4   226    1     3
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
FinalVolume:    7  570   418    10  466     2     3    1     4   226    1     3
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:  4.1 xxxx xxxxx   4.1 xxxx xxxxx   7.1  6.5   6.2   7.1  6.5   6.2
FollowUpTim:  2.2 xxxx xxxxx   2.2 xxxx xxxxx   3.5  4.0   3.3   3.5  4.0   3.3
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: 468 xxxx xxxxx   988 xxxx xxxxx  1281 1488   467  1282 1280   779
Potent Cap.: 1104 xxxx xxxxx   707 xxxx xxxxx   144  125   600   144  167   399
Move Cap.:   1104 xxxx xxxxx   707 xxxx xxxxx   140  123   600   140  164   399
Volume/Cap:  0.01 xxxx  xxxx  0.01 xxxx  xxxx  0.02 0.01  0.01  1.62 0.01  0.01
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
2Way95thQ:    0.0 xxxx xxxxx   0.0 xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Control Del:  8.3 xxxx xxxxx  10.2 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:    A    *     *     B    *     *     *    *     *     *    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx  221 xxxxx  xxxx  141 xxxxx
SharedQueue:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx  0.1 xxxxx xxxxx 16.4 xxxxx
Shrd ConDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx 22.0 xxxxx xxxxx  371 xxxxx
Shared LOS:     *    *     *     *    *     *     *    C     *     *    F     *
ApproachDel:     xxxxxx           xxxxxx             22.0            371.4
ApproachLOS:        *                *                C                 F
*********************************************************************************
Note: Queue reported is the number of cars per lane.
*********************************************************************************
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               Evergreen/Helvetia Conceptual Design Plan
                             PM Peak Hour
                   Future No Build Conditions (2030)
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                   Level Of Service Computation Report
         2000 HCM Operations Method (Base Volume Alternative)
********************************************************************************
Intersection #16 NW Shute Rd/Hwy 26 WB Ramp
********************************************************************************
Cycle (sec):          70               Critical Vol./Cap.(X):         0.878
Loss Time (sec):      12 (Y+R=4.0 sec) Average Delay (sec/veh):        26.3
Optimal Cycle:        84               Level Of Service:                  C
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Protected        Protected        Protected        Protected
Rights:          Include          Include          Include          Include
Min. Green:    0    0    0     0    0    0     0    0    0     0    0    0
Lanes:       1  0  1  0  0   0  0  1  1  0   0  0  0  0  0   1  1  0  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:     275  798    0     0  415   58     0    0    0   701    0   70
Growth Adj:  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
Initial Bse:  275  798    0     0  415   58     0    0    0   701    0   70
User Adj:    1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
PHF Adj:     0.92 0.92 0.92  0.92 0.92 0.92  0.92 0.92 0.92  0.92 0.92 0.92
PHF Volume:   299  867    0     0  451   63     0    0    0   762    0   76
Reduct Vol:     0    0    0     0    0    0     0    0    0     0    0    0
Reduced Vol:  299  867    0     0  451   63     0    0    0   762    0   76
PCE Adj:     1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
MLF Adj:     1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
FinalVolume:  299  867    0     0  451   63     0    0    0   762    0   76
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1800 1800 1800  1800 1800 1800  1800 1800 1800  1800 1800 1800
Adjustment:  0.92 0.97 1.00  1.00 0.90 0.89  1.00 1.00 1.00  0.92 1.00 0.82
Lanes:       1.00 1.00 0.00  0.00 1.75 0.25  0.00 0.00 0.00  2.00 0.00 1.00
Final Sat.:  1660 1748    0     0 2833  396     0    0    0  3297    0 1472
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.18 0.50 0.00  0.00 0.16 0.16  0.00 0.00 0.00  0.23 0.00 0.05
Crit Moves:       ****       ****                              ****
Green/Cycle: 0.30 0.57 0.00  0.00 0.27 0.27  0.00 0.00 0.00  0.26 0.00 0.26
Volume/Cap:  0.60 0.88 0.00  0.00 0.60 0.60  0.00 0.00 0.00  0.88 0.00 0.20
Delay/Veh:   23.0 22.2  0.0   0.0 23.7 23.7   0.0  0.0  0.0  34.8  0.0 20.3
User DelAdj: 1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
AdjDel/Veh:  23.0 22.2  0.0   0.0 23.7 23.7   0.0  0.0  0.0  34.8  0.0 20.3
LOS by Move:    C    C    A     A    C    C     A    A    A     C    A    C
HCM2kAvgQ:      6   20    0     0    6    6     0    0    0    11    0    1
********************************************************************************
Note: Queue reported is the number of cars per lane.
********************************************************************************
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--------------------------------------------------------------------------------
               Evergreen/Helvetia Conceptual Design Plan
                             PM Peak Hour
                   Future No Build Conditions (2030)
--------------------------------------------------------------------------------

                   Level Of Service Computation Report
         2000 HCM Operations Method (Base Volume Alternative)
********************************************************************************
Intersection #17 NW Shute Rd/Hwy 26 EB Ramp
********************************************************************************
Cycle (sec):          70               Critical Vol./Cap.(X):         1.093
Loss Time (sec):      12 (Y+R=4.0 sec) Average Delay (sec/veh):        50.3
Optimal Cycle:       180               Level Of Service:                  D
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Protected        Protected        Protected        Protected
Rights:          Ignore           Include          Include          Include
Min. Green:    0    0    0     0    0    0     0    0    0     0    0    0
Lanes:       0  0  1  0  1   1  0  2  0  0   0  1  0  0  1   0  0  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       0 1131  886   129 1005    0    42    1  191     0    0    0
Growth Adj:  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
Initial Bse:    0 1131  886   129 1005    0    42    1  191     0    0    0
User Adj:    1.00 1.00 0.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
PHF Adj:     0.93 0.93 0.00  0.93 0.93 0.93  0.93 0.93 0.93  0.93 0.93 0.93
PHF Volume:     0 1216    0   139 1081    0    45    1  205     0    0    0
Reduct Vol:     0    0    0     0    0    0     0    0    0     0    0    0
Reduced Vol:    0 1216    0   139 1081    0    45    1  205     0    0    0
PCE Adj:     1.00 1.00 0.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
MLF Adj:     1.00 1.00 0.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
FinalVolume:    0 1216    0   139 1081    0    45    1  205     0    0    0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1800 1800 1800  1800 1800 1800  1800 1800 1800  1800 1800 1800
Adjustment:  1.00 0.99 1.00  0.92 0.92 1.00  0.94 0.94 0.82  1.00 1.00 1.00
Lanes:       0.00 1.00 1.00  1.00 2.00 0.00  0.98 0.02 1.00  0.00 0.00 0.00
Final Sat.:     0 1782 1800  1660 3321    0  1646   39 1472     0    0    0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.68 0.00  0.08 0.33 0.00  0.03 0.03 0.14  0.00 0.00 0.00
Crit Moves:       ****       ****                        ****
Green/Cycle: 0.00 0.62 0.00  0.08 0.70 0.00  0.13 0.13 0.13  0.00 0.00 0.00
Volume/Cap:  0.00 1.09 0.00  1.09 0.46 0.00  0.21 0.21 1.09  0.00 0.00 0.00
Delay/Veh:    0.0 69.1  0.0 139.3  4.8  0.0  27.9 27.9 123.2  0.0  0.0  0.0
User DelAdj: 1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
AdjDel/Veh:   0.0 69.1  0.0 139.3  4.8  0.0  27.9 27.9 123.2  0.0  0.0  0.0
LOS by Move:    A    E    A     F    A    A     C    C    F     A    A    A
HCM2kAvgQ:      0   44    0     8    6    0     1    1   10     0    0    0
********************************************************************************
Note: Queue reported is the number of cars per lane.
********************************************************************************
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--------------------------------------------------------------------------------
                   Evergreen/Helvetia Conceptual Design Plan
                                PM Peak Hour
                       Future No Build Conditions (2030)
--------------------------------------------------------------------------------
                      Level Of Service Computation Report
             2000 HCM Unsignalized Method (Base Volume Alternative)
********************************************************************************
Intersection #18 NW Shute/NW Huffman St
********************************************************************************
Average Delay (sec/veh):     49.7      Worst Case Level Of Service: F[1591.0]
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:    L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Rights:           Include          Include          Include          Include
Lanes:       0  0  1  1  0   1  0  2  0  0   0  0  0  0  0   1  0  0  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       0 1835    40    56 1009     0     0    0     0    67    0    27
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    0 1835    40    56 1009     0     0    0     0    67    0    27
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.92 0.92  0.92  0.92 0.92  0.92  0.92 0.92  0.92  0.92 0.92  0.92
PHF Volume:     0 1995    43    61 1097     0     0    0     0    73    0    29
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
FinalVolume:    0 1995    43    61 1097     0     0    0     0    73    0    29
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:xxxxx xxxx xxxxx   4.1 xxxx xxxxx xxxxx xxxx xxxxx   6.8 xxxx   6.9
FollowUpTim:xxxxx xxxx xxxxx   2.2 xxxx xxxxx xxxxx xxxx xxxxx   3.5 xxxx   3.3
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: xxxx xxxx xxxxx  2038 xxxx xxxxx  xxxx xxxx xxxxx  2686 xxxx  1019
Potent Cap.: xxxx xxxx xxxxx   281 xxxx xxxxx  xxxx xxxx xxxxx    18 xxxx   238
Move Cap.:   xxxx xxxx xxxxx   281 xxxx xxxxx  xxxx xxxx xxxxx    15 xxxx   238
Volume/Cap:  xxxx xxxx  xxxx  0.22 xxxx  xxxx  xxxx xxxx  xxxx  4.82 xxxx  0.12
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
2Way95thQ:   xxxx xxxx xxxxx   0.8 xxxx xxxxx  xxxx xxxx xxxxx  10.0 xxxx   0.4
Control Del:xxxxx xxxx xxxxx  21.3 xxxx xxxxx xxxxx xxxx xxxxx  2223 xxxx  22.2
LOS by Move:    *    *     *     C    *     *     *    *     *     F    *     C
Movement:    LT - LTR - RT   LT - LTR - RT   LT - LTR - RT   LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
SharedQueue:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shrd ConDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS:     *    *     *     *    *     *     *    *     *     *    *     *
ApproachDel:     xxxxxx           xxxxxx           xxxxxx           1591.0
ApproachLOS:        *                *                *                F
********************************************************************************
Note: Queue reported is the number of cars per lane.
********************************************************************************
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--------------------------------------------------------------------------------
                   Evergreen/Helvetia Conceptual Design Plan
                                PM Peak Hour
                       Future No Build Conditions (2030)
--------------------------------------------------------------------------------
                      Level Of Service Computation Report
             2000 HCM Operations Method (Base Volume Alternative)
********************************************************************************
Intersection #19 NW Shute Rd/NE Shute Rd
********************************************************************************
Cycle (sec):          100                Critical Vol./Cap.(X):         0.757
Loss Time (sec):       12 (Y+R=4.0 sec)  Average Delay (sec/veh):        16.9
Optimal Cycle:         68                Level Of Service:                  B
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:    L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected        Protected        Protected
Rights:           Include          Include          Include            Ovl
Min. Green:     0    0     0     0    0     0     0    0     0     0    0     0
Lanes:       0  0  1  1  0   1  0  2  0  0   0  0  0  0  0   1  0  0  0  2
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       0  722    13   670  864     0     0    0     0     9    0   663
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    0  722    13   670  864     0     0    0     0     9    0   663
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.92 0.92  0.92  0.92 0.92  0.92  0.92 0.92  0.92  0.92 0.92  0.92
PHF Volume:     0  785    14   728  939     0     0    0     0    10    0   721
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:    0  785    14   728  939     0     0    0     0    10    0   721
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:    0  785    14   728  939     0     0    0     0    10    0   721
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1800 1800  1800  1800 1800  1800  1800 1800  1800  1800 1800  1800
Adjustment:  1.00 0.95  0.95  0.95 0.95  1.00  1.00 1.00  1.00  0.95 1.00  0.75
Lanes:       0.00 1.96  0.04  1.00 2.00  0.00  0.00 0.00  0.00  1.00 0.00  2.00
Final Sat.:     0 3349    60  1710 3420     0     0    0     0  1710    0  2693
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.23  0.23  0.43 0.27  0.00  0.00 0.00  0.00  0.01 0.00  0.27
Crit Moves:       ****        ****                                ****
Green/Cycle: 0.00 0.31  0.31  0.56 0.87  0.00  0.00 0.00  0.00  0.01 0.00  0.57
Volume/Cap:  0.00 0.76  0.76  0.76 0.31  0.00  0.00 0.00  0.00  0.76 0.00  0.47
Delay/Veh:    0.0 34.3  34.3  20.1  1.2   0.0   0.0  0.0   0.0 174.7  0.0  12.8
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:   0.0 34.3  34.3  20.1  1.2   0.0   0.0  0.0   0.0 174.7  0.0  12.8
LOS by Move:    A    C     C     C    A     A     A    A     A     F    A     B
HCM2kAvgQ:      0   13    13    18    3     0     0    0     0     1    0     8
********************************************************************************
Note: Queue reported is the number of cars per lane.
********************************************************************************
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-------------------------------------------------------------------------------
                Evergreen/Helvetia Conceptual Design Plan
                              PM Peak Hour
                    Future No Build Conditions (2030)
-------------------------------------------------------------------------------

                   Level Of Service Computation Report
          2000 HCM Operations Method (Base Volume Alternative)
*******************************************************************************
Intersection #20 NE Brookwood Pkwy/NE Cornell Rd
*******************************************************************************
Cycle (sec):         180              Critical Vol./Cap.(X):        1.436
Loss Time (sec):      16 (Y+R=4.0 sec) Average Delay (sec/veh):      190.7
Optimal Cycle:       180              Level Of Service:                 F
*******************************************************************************
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Protected        Protected        Protected        Protected
Rights:          Include          Include          Include          Include
Min. Green:    0    0    0    0    0    0    0    0    0    0    0    0
Lanes:       1  0  1  1  0    1  0  1  0  1    1  0  1  1  0    1  0  1  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      29  398   185   150  965   294   260 1098   100   297 1533   212
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   29  398   185   150  965   294   260 1098   100   297 1533   212
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.95 0.95  0.95  0.95 0.95  0.95  0.95 0.95  0.95  0.95 0.95  0.95
PHF Volume:    31  419   195   158 1016   309   274 1156   105   313 1614   223
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:   31  419   195   158 1016   309   274 1156   105   313 1614   223
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:   31  419   195   158 1016   309   274 1156   105   313 1614   223
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1800 1800  1800  1800 1800  1800  1800 1800  1800  1800 1800  1800
Adjustment:  0.93 0.89  0.89  0.93 0.98  0.83  0.94 0.93  0.93  0.94 0.92  0.92
Lanes:       1.00 1.36  0.64  1.00 1.00  1.00  1.00 1.83  0.17  1.00 1.76  0.24
Final Sat.:  1676 2178  1012  1676 1764  1499  1693 3066   279  1693 2921   404
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.02 0.19  0.19  0.09 0.58  0.21  0.16 0.38  0.38  0.18 0.55  0.55
Crit Moves:  ****                  ****        ****                   ****
Green/Cycle: 0.01 0.28  0.28  0.14 0.40  0.40  0.11 0.33  0.33  0.16 0.38  0.38
Volume/Cap:  1.44 0.69  0.69  0.69 1.44  0.51  1.44 1.13  1.13  1.13 1.44  1.44
Delay/Veh:  440.5 60.5  60.5  83.0  258  41.5 303.3  130 129.8 168.8  256 256.0
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh: 440.5 60.5  60.5  83.0  258  41.5 303.3  130 129.8 168.8  256 256.0
LOS by Move:    F    E     E     F    F     D     F    F     F     F    F     F
HCM2kAvgQ:      4   16    16     9   92    13    27   48    48    25   88    88
*******************************************************************************
Note: Queue reported is the number of cars per lane.
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-------------------------------------------------------------------------------
                Evergreen/Helvetia Conceptual Design Plan
                              PM Peak Hour
                    Future No Build Conditions (2030)
-------------------------------------------------------------------------------

                   Level Of Service Computation Report
          2000 HCM Operations Method (Base Volume Alternative)
*******************************************************************************
Intersection #21 NE Brookwood Pkwy/W Baseline Rd
*******************************************************************************
Cycle (sec):          95              Critical Vol./Cap.(X):        1.487
Loss Time (sec):      16 (Y+R=4.0 sec) Average Delay (sec/veh):      179.0
Optimal Cycle:       180              Level Of Service:                 F
*******************************************************************************
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Protected        Protected        Protected        Protected
Rights:          Include          Include          Include          Include
Min. Green:    0    0    0    0    0    0    0    0    0    0    0    0
Lanes:       1  0  0  1  0    1  0  1  0  1    1  0  1  0  1    1  0  0  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:     196  342    80    81  608    92   115  677   160   579  488    83
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:  196  342    80    81  608    92   115  677   160   579  488    83
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.96 0.96  0.96  0.96 0.96  0.96  0.96 0.96  0.96  0.96 0.96  0.96
PHF Volume:   204  356    83    84  633    96   120  705   167   603  508    86
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:  204  356    83    84  633    96   120  705   167   603  508    86
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:  204  356    83    84  633    96   120  705   167   603  508    86
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1800 1800  1800  1800 1800  1800  1800 1800  1800  1800 1800  1800
Adjustment:  0.93 0.95  0.95  0.94 0.99  0.84  0.93 0.98  0.82  0.93 0.96  0.96
Lanes:       1.00 0.81  0.19  1.00 1.00  1.00  1.00 1.00  1.00  1.00 0.85  0.15
Final Sat.:  1676 1389   325  1693 1782  1515  1676 1764  1476  1676 1474   251
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.12 0.26  0.26  0.05 0.36  0.06  0.07 0.40  0.11  0.36 0.34  0.34
Crit Moves:  ****                  ****              ****        ****
Green/Cycle: 0.08 0.27  0.27  0.05 0.24  0.24  0.09 0.27  0.27  0.24 0.42  0.42
Volume/Cap:  1.49 0.95  0.95  0.95 1.49  0.26  0.82 1.49  0.42  1.49 0.82  0.82
Delay/Veh:  297.5 64.7  64.7 125.3  268  29.8  70.9  265  29.4 268.2 31.2  31.2
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh: 297.5 64.7  64.7 125.3  268  29.8  70.9  265  29.4 268.2 31.2  31.2
LOS by Move:    F    E     E     F    F     C     E    F     C     F    C     C
HCM2kAvgQ:     16   18    18     5   45     2     6   50     4    43   17    17
*******************************************************************************
Note: Queue reported is the number of cars per lane.
*******************************************************************************
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---------------------------------------------------------------------------
                   Evergreen/Helvetia Conceptual Design Plan
                                 PM Peak Hour
                       Future No Build Conditions (2030)
---------------------------------------------------------------------------

                        Level Of Service Computation Report
           2000 HCM Unsignalized Method (Base Volume Alternative)
***************************************************************************
Intersection #22 NW Jacobson Rd/NW Century Blvd
***************************************************************************
Average Delay (sec/veh): OVERFLOW       Worst Case Level Of Service: F[xxxxx]
***************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Stop Sign        Stop Sign       Uncontrolled     Uncontrolled
Rights:           Include          Include          Include          Include
Lanes:        1  0  0  1  0    0  0  1  0  0    0  0  1! 0  0    0  1  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      264  255   335     0  132     0    15  394   105   257   53     0
Growth Adj:   1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   264  255   335     0  132     0    15  394   105   257   53     0
User Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:      0.92 0.92  0.92  0.92 0.92  0.92  0.92 0.92  0.92  0.92 0.92  0.92
PHF Volume:    287  277   364     0  143     0    16  428   114   279   58     0
Reduct Vol:      0    0     0     0    0     0     0    0     0     0    0     0
FinalVolume:   287  277   364     0  143     0    16  428   114   279   58     0
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:   7.1  6.5   6.2 xxxxx  6.5 xxxxx   4.1 xxxx xxxxx   4.1 xxxx xxxxx
FollowUpTim:   3.5  4.0   3.3 xxxxx  4.0 xxxxx   2.2 xxxx xxxxx   2.2 xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: 1206 1134   485  xxxx 1191 xxxxx    58 xxxx xxxxx   542 xxxx xxxxx
Potent Cap.:  162  204   586  xxxx  189 xxxxx  1560 xxxx xxxxx  1037 xxxx xxxxx
Move Cap.:      0  138   586  xxxx  127 xxxxx  1560 xxxx xxxxx  1037 xxxx xxxxx
Volume/Cap:   xxxx 2.01  0.62  xxxx 1.13  xxxx  0.01 xxxx  xxxx  0.27 xxxx  xxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
2Way95thQ:    xxxx xxxx xxxxx  xxxx  8.4 xxxxx   0.0 xxxx xxxxx   1.1 xxxx xxxxx
Control Del:xxxxx xxxx xxxxx xxxxx  185 xxxxx   7.3 xxxx xxxxx   9.7 xxxx xxxxx
LOS by Move:     *    *     *     *    F     *     A    *     *     A    *     *
Movement:       LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx   243  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
SharedQueue:xxxxx xxxx  54.2 xxxxx xxxx xxxxx xxxxx xxxx xxxxx   1.1 xxxx xxxxx
Shrd ConDel:xxxxx xxxx 778.9 xxxxx xxxx xxxxx xxxxx xxxx xxxxx   9.7 xxxx xxxxx
Shared LOS:      *    *     F     *    *     *     *    *     *     A    *     *
ApproachDel:       xxxxxx           185.0           xxxxxx           xxxxxx
ApproachLOS:          F                F                *                *
***************************************************************************
Note: Queue reported is the number of cars per lane.
***************************************************************************
```



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---------------------------------------------------------------------------
                   Evergreen/Helvetia Conceptual Design Plan
                                 PM Peak Hour
                       Future No Build Conditions (2030)
---------------------------------------------------------------------------

                        Level Of Service Computation Report
           2000 HCM Operations Method (Base Volume Alternative)
***************************************************************************
Intersection #23 NW Cornelius Pass Rd/NW Jacobson Rd
***************************************************************************
Cycle (sec):            70                Critical Vol./Cap.(X):        1.219
Loss Time (sec):        16 (Y+R=4.0 sec)  Average Delay (sec/veh):       95.3
Optimal Cycle:         180                Level Of Service:                F
***************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected        Protected        Protected
Rights:           Include          Include          Include          Include
Min. Green:     0    0     0     0    0     0     0    0     0     0    0     0
Lanes:        1  0  1  1  0    1  0  1  1  0    1  0  0  1  0    1  0  0  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       99 1417   106    17  637    90   665  233   232    15   20     8
Growth Adj:   1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    99 1417   106    17  637    90   665  233   232    15   20     8
User Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:      0.92 0.92  0.92  0.92 0.92  0.92  0.92 0.92  0.92  0.92 0.92  0.92
PHF Volume:    108 1540   115    18  692    98   723  253   252    16   22     9
Reduct Vol:      0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:   108 1540   115    18  692    98   723  253   252    16   22     9
PCE Adj:      1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:      1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:   108 1540   115    18  692    98   723  253   252    16   22     9
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:     1800 1800  1800  1800 1800  1800  1800 1800  1800  1800 1800  1800
Adjustment:   0.95 0.94  0.94  0.95 0.93  0.93  0.95 0.93  0.92  0.95 0.96  0.96
Lanes:        1.00 1.86  0.14  1.00 1.75  0.25  1.00 0.50  0.50  1.00 0.71  0.29
Final Sat.:   1710 3150   236  1710 2938   415  1710  834   830  1710 1230   492
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:      0.06 0.49  0.49  0.01 0.24  0.24  0.42 0.30  0.30  0.01 0.02  0.02
Crit Moves:        ****        ****             ****                  ****
Green/Cycle: 0.09 0.40  0.40  0.01 0.32  0.32  0.35 0.35  0.35  0.01 0.01  0.01
Volume/Cap:   0.73 1.22  1.22  1.22 0.73  0.73  1.22 0.87  0.87  0.87 1.22  1.22
Delay/Veh:    47.8  126 126.3 343.8 23.5  23.5 136.0 34.2  34.2 178.6  289 288.5
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:   47.8  126 126.3 343.8 23.5  23.5 136.0 34.2  34.2 178.6  289 288.5
LOS by Move:     D    F     F     F    C     C     F    C     C     F    F     F
HCM2kAvgQ:       4   41    41     2   10    10    35   14    14     2    3     3
***************************************************************************
Note: Queue reported is the number of cars per lane.
***************************************************************************
```

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--------------------------------------------------------------------------------
                   Evergreen/Helvetia Conceptual Design Plan
                                PM Peak Hour
                       Future No Build Conditions (2030)
--------------------------------------------------------------------------------

                      Level Of Service Computation Report
             2000 HCM 4-Way Stop Method (Base Volume Alternative)
********************************************************************************
Intersection #326
********************************************************************************
Cycle (sec):         100              Critical Vol./Cap.(X):         0.952
Loss Time (sec):       0 (Y+R=4.0 sec)  Average Delay (sec/veh):      37.3
Optimal Cycle:         0              Level Of Service:                  E
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Stop Sign        Stop Sign        Stop Sign        Stop Sign
Rights:           Include          Include          Include          Include
Min. Green:     0    0     0     0    0     0     0    0     0     0    0     0
Lanes:        0  0  1! 0  0    0  0  1! 0  0    0  0  1! 0  0    0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      40  169   289     7   77    15    35  170    63   187  227    13
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   40  169   289     7   77    15    35  170    63   187  227    13
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.92 0.92  0.92  0.92 0.92  0.92  0.92 0.92  0.92  0.92 0.92  0.92
PHF Volume:    43  184   314     8   84    16    38  185    68   203  247    14
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:   43  184   314     8   84    16    38  185    68   203  247    14
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:   43  184   314     8   84    16    38  185    68   203  247    14
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Adjustment:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Lanes:       0.08 0.34  0.58  0.07 0.78  0.15  0.13 0.63  0.24  0.44 0.53  0.03
Final Sat.:    46  193   330    30  331    64    64  311   115   229  278    16
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.95 0.95  0.95  0.25 0.25  0.25  0.59 0.59  0.59  0.89 0.89  0.89
Crit Moves:  ****                  ****        ****              ****
Delay/Veh:   49.7 49.7  49.7  13.0 13.0  13.0  18.7 18.7  18.7  40.1 40.1  40.1
Delay Adj:   1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:  49.7 49.7  49.7  13.0 13.0  13.0  18.7 18.7  18.7  40.1 40.1  40.1
LOS by Move:    E    E     E     B    B     B     C    C     C     E    E     E
ApproachDel:      49.7             13.0             18.7             40.1
Delay Adj:        1.00             1.00             1.00             1.00
ApprAdjDel:       49.7             13.0             18.7             40.1
LOS by Appr:        E                B                C                E
AllWayAvgQ:    6.4  6.4   6.4   0.3  0.3   0.3   1.2  1.2   1.2   4.4  4.4   4.4
********************************************************************************
Note: Queue reported is the number of cars per lane.
********************************************************************************
```

Evergreen/Helvetia Conceptual Design Plan
PM Peak Hour
Future Build Conditions (2030)

Scenario Report

Scenario:	2030 No Build PM Peak
Command:	Default Command
Volume:	Default Volume
Geometry:	Default Geometry
Impact Fee:	Default Impact Fee
Trip Generation:	Default Trip Generation
Trip Distribution:	Default Trip Distribution
Paths:	Default Path
Routes:	Default Route
Configuration:	Default Configuration

Evergreen/Helvetia Conceptual Design Plan
PM Peak Hour
Future Build Conditions (2030)

Impact Analysis Report
Level Of Service

Intersection	Base LOS	Base Del/ Veh	Base V/C	Future LOS	Future Del/ Veh	Future V/C	Change in
# 1 NW Glencoe Rd/NW Evergreen Rd	F	211.8	1.561	F	211.8	1.561	+ 0.000 D/V
# 2 NE Jackson School Rd/NW Evergr	F	158.6	1.343	F	158.6	1.343	+ 0.000 D/V
# 3 NW Jackson School Rd/NW Evergr	F	142.5	1.403	F	142.5	1.403	+ 0.000 D/V
# 4 NE 25th Ave/NW Evergreen Rd	C	24.9	0.873	C	24.9	0.873	+ 0.000 D/V
# 5 NW Sewell Rd/NW Evergreen Rd	F	OVRFL	0.000	F	OVRFL	0.000	+ 0.000 D/V
# 6 NW SHute Rd/NW Evergreen Pkwy	F	129.3	1.345	F	129.3	1.345	+ 0.000 D/V
# 7 NW 229th Ave/NW Evergreen Rd	F	158.1	1.336	F	158.1	1.336	+ 0.000 D/V
# 8 NW Cornelius Pass Rd/NW Evergr	F	231.3	1.568	F	231.3	1.568	+ 0.000 D/V
# 9 NW Jackson School Rd/Hwy 26 WB	F	601.8	0.000	F	601.8	0.000	+ 0.000 D/V
# 10 NW Jackson School Rd/Hwy 26 EB	E	44.5	0.000	E	44.5	0.000	+ 0.000 D/V
# 11 NW Jackson School Rd/NW Meek R	F	305.6	0.000	F	305.6	0.000	+ 0.000 D/V
# 15 NW Helvetia Rd/NW Jacobson Rd	F	746.2	0.000	F	746.2	0.000	+ 0.000 D/V
# 16 NW Shute Rd/Hwy 26 WB Ramp	D	35.1	0.957	D	35.1	0.957	+ 0.000 D/V
# 17 NW Shute Rd/Hwy 26 EB Ramp	F	97.6	1.281	F	97.6	1.281	+ 0.000 D/V
# 18 NW Shute/NW Huffman St	F	OVRFL	0.000	F	OVRFL	0.000	+ 0.000 D/V
# 19 NW Shute Rd/NE Shute Rd	B	17.4	0.787	B	17.4	0.787	+ 0.000 D/V
# 20 NE Brookwood Pkwy/NE Cornell R	F	199.5	1.447	F	199.5	1.447	+ 0.000 D/V
# 21 NE Brookwood Pkwy/W Baseline R	F	179.9	1.498	F	179.9	1.498	+ 0.000 D/V
# 22 NW Jacobson Rd/NW Century Blvd	F	OVRFL	0.000	F	OVRFL	0.000	+ 0.000 D/V
# 23 NW Cornelius Pass Rd/NW Jacobs	F	99.9	1.234	F	99.9	1.234	+ 0.000 D/V
#325 NW Helvetia Rd/West Union Rd	D	26.5	0.842	D	26.5	0.842	+ 0.000 V/C

Traffix 7.9.0415 (c) 2007 Dowling Assoc. Licensed to DKS ASSOC., PORTLAND, OR

Evergreen/Helvetia Conceptual Design Plan
PM Peak Hour
Future Build Conditions (2030)

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

Intersection #1 NW Glencoe Rd/NW Evergreen Rd

Cycle (sec):	50	Critical Vol./Cap.(X):	1.561
Loss Time (sec):	12 (Y+R=4.0 sec)	Average Delay (sec/veh):	211.8
Optimal Cycle:	180	Level Of Service:	F

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0 0 0 1 0			1 0 1 0 0			0 0 0 0 0			1 0 0 0 1		
Volume Module:												
Base Vol:	0	489	458	171	448	0	0	0	0	774	0	202
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	489	458	171	448	0	0	0	0	774	0	202
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
PHF Volume:	0	520	487	182	477	0	0	0	0	823	0	215
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	520	487	182	477	0	0	0	0	823	0	215
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	0	520	487	182	477	0	0	0	0	823	0	215
Saturation Flow Module:												
Sat/Lane:	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Adjustment:	1.00	0.94	0.94	0.95	1.00	1.00	1.00	1.00	1.00	0.95	1.00	0.85
Lanes:	0.00	0.52	0.48	1.00	1.00	0.00	0.00	0.00	0.00	1.00	0.00	1.00
Final Sat.:	0	869	814	1710	1800	0	0	0	0	1710	0	1530
Capacity Analysis Module:												
Vol/Sat:	0.00	0.60	0.60	0.11	0.26	0.00	0.00	0.00	0.00	0.48	0.00	0.14
Crit Moves:		****		****						****		
Green/Cycle:	0.00	0.38	0.38	0.07	0.45	0.00	0.00	0.00	0.00	0.31	0.00	0.31
Volume/Cap:	0.00	1.56	1.56	1.56	0.59	0.00	0.00	0.00	0.00	1.56	0.00	0.46
Delay/Veh:	0.0	275	275.5	313.3	11.3	0.0	0.0	0.0	0.0	279.0	0.0	14.6
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	275	275.5	313.3	11.3	0.0	0.0	0.0	0.0	279.0	0.0	14.6
LOS by Move:	A	F	F	F	B	A	A	A	A	F	A	B
HCM2kAvgQ:	0	62	62	13	6	0	0	0	0	51	0	3

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

Evergreen/Helvetia Conceptual Design Plan
PM Peak Hour
Future Build Conditions (2030)

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

Intersection #2 NE Jackson School Rd/NW Evergreen Rd

Cycle (sec):	60	Critical Vol./Cap.(X):	1.343
Loss Time (sec):	12 (Y+R=4.0 sec)	Average Delay (sec/veh):	158.6
Optimal Cycle:	180	Level Of Service:	F

Street Name: Jackson School - driveway

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Protected			Protected		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0 1 0 0 1			0 0 1! 0 0			1 0 0 1 0			1 0 0 1 0		
Volume Module:												
Base Vol:	95	0	431	0	0	0	0	573	126	491	1135	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	95	0	431	0	0	0	0	573	126	491	1135	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
PHF Volume:	103	0	468	0	0	0	0	623	137	534	1234	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	103	0	468	0	0	0	0	623	137	534	1234	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	103	0	468	0	0	0	0	623	137	534	1234	0
Saturation Flow Module:												
Sat/Lane:	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Adjustment:	0.71	1.00	0.84	1.00	1.00	1.00	1.00	0.94	0.94	0.93	0.98	1.00
Lanes:	1.00	0.00	1.00	0.00	1.00	0.00	1.00	0.82	0.18	1.00	1.00	0.00
Final Sat.:	1272	0	1515	0	1800	0	1800	1394	306	1676	1764	0
Capacity Analysis Module:												
Vol/Sat:	0.08	0.00	0.31	0.00	0.00	0.00	0.00	0.45	0.45	0.32	0.70	0.00
Crit Moves:			****					****		****		
Green/Cycle:	0.23	0.00	0.23	0.00	0.00	0.00	0.00	0.33	0.33	0.24	0.57	0.00
Volume/Cap:	0.35	0.00	1.34	0.00	0.00	0.00	0.00	1.34	1.34	1.34	1.23	0.00
Delay/Veh:	20.1	0.0	195.7	0.0	0.0	0.0	0.0	186	186.1	193.4	124	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	20.1	0.0	195.7	0.0	0.0	0.0	0.0	186	186.1	193.4	124	0.0
LOS by Move:	C	A	F	A	A	A	A	F	F	F	F	A
HCM2kAvgQ:	2	0	26	0	0	0	0	40	40	29	54	0

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

Evergreen/Helvetia Conceptual Design Plan
PM Peak Hour
Future Build Conditions (2030)

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

Intersection #3 NW Jackson School Rd/NW Evergreen Rd

Cycle (sec):	60	Critical Vol./Cap.(X):	1.403
Loss Time (sec):	12 (Y+R=4.0 sec)	Average Delay (sec/veh):	142.5
Optimal Cycle:	180	Level Of Service:	F

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:		Permitted			Permitted			Protected			Protected	
Rights:		Include			Ovl			Include			Include	
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:		0 0 1! 0 0			0 1 0 0 1			1 0 0 1 0			1 0 1 0 1	
Volume Module:												
Base Vol:	2	1	2	155	2	556	462	540	3	9	1122	524
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	2	1	2	155	2	556	462	540	3	9	1122	524
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
PHF Volume:	2	1	2	168	2	604	502	587	3	10	1220	570
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	2	1	2	168	2	604	502	587	3	10	1220	570
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	2	1	2	168	2	604	502	587	3	10	1220	570
Saturation Flow Module:												
Sat/Lane:	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Adjustment:	0.75	0.75	0.75	0.68	0.69	0.82	0.93	0.98	0.98	0.94	0.99	0.82
Lanes:	0.40	0.20	0.40	0.99	0.01	1.00	1.00	0.99	0.01	1.00	1.00	1.00
Final Sat.:	539	270	539	1214	16	1472	1676	1752	10	1693	1782	1482
Capacity Analysis Module:												
Vol/Sat:	0.00	0.00	0.00	0.14	0.14	0.41	0.30	0.33	0.33	0.01	0.68	0.38
Crit Moves:					****		****				****	
Green/Cycle:	0.10	0.10	0.10	0.10	0.10	0.31	0.21	0.69	0.69	0.01	0.49	0.49
Volume/Cap:	0.04	0.04	0.04	1.40	1.40	1.31	1.40	0.49	0.49	0.49	1.40	0.79
Delay/Veh:	24.6	24.6	24.6	250.5	250	176.9	221.2	4.7	4.7	46.8	204	18.6
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	24.6	24.6	24.6	250.5	250	176.9	221.2	4.7	4.7	46.8	204	18.6
LOS by Move:	C	C	C	F	F	F	F	A	A	D	F	B
HCM2kAvgQ:	0	0	0	11	11	32	29	6	6	1	67	11

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

Evergreen/Helvetia Conceptual Design Plan
PM Peak Hour
Future Build Conditions (2030)

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

Intersection #4 NE 25th Ave/NW Evergreen Rd

Cycle (sec):	80	Critical Vol./Cap.(X):	0.873
Loss Time (sec):	12 (Y+R=4.0 sec)	Average Delay (sec/veh):	24.9
Optimal Cycle:	88	Level Of Service:	C

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:		Protected			Protected			Protected			Protected	
Rights:		Ovl			Include			Include			Include	
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:		1 0 0 0 2			0 0 0 0 0			0 0 1 1 0			2 0 2 0 0	
Volume Module:												
Base Vol:	349	0	685	0	0	0	0	1187	129	266	1138	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	349	0	685	0	0	0	0	1187	129	266	1138	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
PHF Volume:	379	0	745	0	0	0	0	1290	140	289	1237	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	379	0	745	0	0	0	0	1290	140	289	1237	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	379	0	745	0	0	0	0	1290	140	289	1237	0
Saturation Flow Module:												
Sat/Lane:	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Adjustment:	0.94	1.00	0.74	1.00	1.00	1.00	1.00	0.93	0.93	0.90	0.93	1.00
Lanes:	1.00	0.00	2.00	0.00	0.00	0.00	0.00	1.80	0.20	2.00	2.00	0.00
Final Sat.:	1693	0	2666	0	0	0	0	3008	327	3251	3352	0
Capacity Analysis Module:												
Vol/Sat:	0.22	0.00	0.28	0.00	0.00	0.00	0.00	0.43	0.43	0.09	0.37	0.00
Crit Moves:	****							****		****		
Green/Cycle:	0.26	0.00	0.36	0.00	0.00	0.00	0.00	0.49	0.49	0.10	0.59	0.00
Volume/Cap:	0.87	0.00	0.78	0.00	0.00	0.00	0.00	0.87	0.87	0.87	0.62	0.00
Delay/Veh:	45.9	0.0	27.0	0.0	0.0	0.0	0.0	23.6	23.6	57.0	11.1	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	45.9	0.0	27.0	0.0	0.0	0.0	0.0	23.6	23.6	57.0	11.1	0.0
LOS by Move:	D	A	C	A	A	A	A	C	C	E	B	A
HCM2kAvgQ:	12	0	11	0	0	0	0	20	20	6	11	0

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

Evergreen/Helvetia Conceptual Design Plan
PM Peak Hour
Future Build Conditions (2030)

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

Intersection #5 NW Sewell Rd/NW Evergreen Rd

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

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Stop Sign			Stop Sign			Uncontrolled			Uncontrolled		
Rights:	Include			Include			Include			Include		
Lanes:	0 0 1! 0 0			0 1 0 0 1			1 0 0 1 0			1 0 0 1 0		
Volume Module:												
Base Vol:	2	0	1	454	0	244	90	1296	4	2	1197	251
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	2	0	1	454	0	244	90	1296	4	2	1197	251
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
PHF Volume:	2	0	1	493	0	265	98	1409	4	2	1301	273
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
FinalVolume:	2	0	1	493	0	265	98	1409	4	2	1301	273
Critical Gap Module:												
Critical Gp:	7.1	6.5	6.2	7.1	6.5	6.2	4.1	xxxx	xxxxx	4.1	xxxx	xxxxx
FollowUpTim:	3.5	4.0	3.3	3.5	4.0	3.3	2.2	xxxx	xxxxx	2.2	xxxx	xxxxx
Capacity Module:												
Cnflict Vol:	3181	3185	1411	3049	3051	1438	1574	xxxx	xxxxx	1413	xxxx	xxxxx
Potent Cap.:	6	10	171	8	13	165	424	xxxx	xxxxx	489	xxxx	xxxxx
Move Cap.:	0	8	171	6	10	165	424	xxxx	xxxxx	489	xxxx	xxxxx
Volume/Cap:	xxxx	0.00	0.01	77.04	0.00	1.61	0.23	xxxx	xxxx	0.00	xxxx	xxxx
Level Of Service Module:												
2Way95thQ:	xxxx	xxxx	xxxxx	xxxx	xxxx	18.0	0.9	xxxx	xxxxx	0.0	xxxx	xxxxx
Control Del:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	348.6	16.0	xxxx	xxxxx	12.4	xxxx	xxxxx
LOS by Move:	*	*	*	*	*	F	C	*	*	B	*	*
Movement:	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT
Shared Cap.:	xxxx	0	xxxxx	6	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
SharedQueue:	xxxxx	xxxx	xxxxx	63.8	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shrd ConDel:	xxxxx	xxxx	xxxxx	35346	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shared LOS:	*	*	*	F	*	*	*	*	*	*	*	*
ApproachDel:	xxxxxx			xxxxxx			xxxxxx			xxxxxx		
ApproachLOS:	F			F			*			*		

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

Evergreen/Helvetia Conceptual Design Plan
PM Peak Hour
Future Build Conditions (2030)

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

Intersection #6 NW SHute Rd/NW Evergreen Pkwy

Cycle (sec): 110 Critical Vol./Cap.(X): 1.345
Loss Time (sec): 16 (Y+R=4.0 sec) Average Delay (sec/veh): 129.3
Optimal Cycle: 180 Level Of Service: F

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Ovl			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1 0 2 0 1			1 0 2 0 2			2 0 1 1 0			2 0 2 0 1		
Volume Module:												
Base Vol:	186	598	558	60	822	307	797	1539	269	387	797	184
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	186	598	558	60	822	307	797	1539	269	387	797	184
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
PHF Volume:	202	650	607	65	893	334	866	1673	292	421	866	200
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	202	650	607	65	893	334	866	1673	292	421	866	200
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	202	650	607	65	893	334	866	1673	292	421	866	200
Saturation Flow Module:												
Sat/Lane:	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Adjustment:	0.95	0.95	0.85	0.95	0.95	0.75	0.92	0.93	0.93	0.92	0.95	0.84
Lanes:	1.00	2.00	1.00	1.00	2.00	2.00	2.00	1.70	0.30	2.00	2.00	1.00
Final Sat.:	1710	3420	1530	1710	3420	2693	3317	2846	497	3317	3420	1508
Capacity Analysis Module:												
Vol/Sat:	0.12	0.19	0.40	0.04	0.26	0.12	0.26	0.59	0.59	0.13	0.25	0.13
Crit Moves:			****	****				****		****		
Green/Cycle:	0.10	0.29	0.29	0.03	0.22	0.49	0.27	0.44	0.44	0.09	0.26	0.26
Volume/Cap:	1.17	0.64	1.34	1.34	1.17	0.25	0.97	1.34	1.34	1.34	0.97	0.51
Delay/Veh:	172.7	35.2	208.1	299.7	135	16.3	62.2	191	190.7	224.8	62.7	35.6
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	172.7	35.2	208.1	299.7	135	16.3	62.2	191	190.7	224.8	62.7	35.6
LOS by Move:	F	D	F	F	F	B	E	F	F	F	E	D
HCM2kAvgQ:	13	11	41	6	28	4	20	68	68	16	20	6

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

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------------------------------------------------------------------------------
                 Evergreen/Helvetia Conceptual Design Plan
                               PM Peak Hour
                      Future Build Conditions (2030)
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                     Level Of Service Computation Report
           1994 HCM Operations Method (Base Volume Alternative)
******************************************************************************
Intersection #7 NW 229th Ave/NW Evergreen Rd
******************************************************************************
Cycle (sec):          110            Critical Vol./Cap.(X):         1.336
Loss Time (sec):       16 (Y+R=4.0 sec) Average Delay (sec/veh):     158.1
Optimal Cycle:        180            Level Of Service:                  F
******************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:    L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Protected        Protected        Protected        Protected
Rights:          Include          Include          Include          Include
Min. Green:    0    0     0    0    0     0    0    0     0    0    0     0
Lanes:       1  0  1  0  1   1  0  0  1  0   1  0  2  0  1   1  0  1  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      89  278   600   221  220   104   192 1616    94   234  735   123
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   89  278   600   221  220   104   192 1616    94   234  735   123
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.95 0.95  0.95  0.95 0.95  0.95  0.95 0.95  0.95  0.95 0.95  0.95
PHF Volume:    94  293   632   233  232   109   202 1701    99   246  774   129
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:   94  293   632   233  232   109   202 1701    99   246  774   129
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.05  1.00  1.00 1.05  1.05
FinalVolume:   94  293   632   233  232   109   202 1786    99   246  812   136
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1900 1900  1900  1900 1900  1900  1900 1900  1900  1900 1900  1900
Adjustment:  0.94 0.99  0.84  0.91 0.91  0.91  0.94 0.99  0.84  0.94 0.97  0.97
Lanes:       1.00 1.00  1.00  1.00 0.68  0.32  1.00 2.00  1.00  1.00 1.71  0.29
Final Sat.:  1787 1881  1599  1736 1178   557  1787 3762  1599  1787 3159   529
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.05 0.16  0.39  0.13 0.20  0.20  0.11 0.47  0.06  0.14 0.26  0.26
Crit Moves:             ****  ****                  ****        ****
Green/Cycle: 0.08 0.30  0.30  0.10 0.31  0.31  0.14 0.36  0.36  0.10 0.32  0.32
Volume/Cap:  0.63 0.53  1.34  1.34 0.63  0.63  0.81 1.34  0.17  1.34 0.81  0.81
Delay/Veh:   37.1 21.6 251.5 285.5 22.5  22.5  41.5  237  15.8 283.2 25.2  25.2
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:  37.1 21.6 251.5 285.5 22.5  22.5  41.5  237  15.8 283.2 25.2  25.2
DesignQueue:    5   13    30    13   15    15    11   40     4    14   21    21
******************************************************************************
Note: Queue reported is the number of cars per lane.
******************************************************************************
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------------------------------------------------------------------------------
                 Evergreen/Helvetia Conceptual Design Plan
                               PM Peak Hour
                      Future Build Conditions (2030)
------------------------------------------------------------------------------

                     Level Of Service Computation Report
           2000 HCM Operations Method (Base Volume Alternative)
******************************************************************************
Intersection #8 NW Cornelius Pass Rd/NW Evergreen Pkwy
******************************************************************************
Cycle (sec):          125            Critical Vol./Cap.(X):         1.568
Loss Time (sec):       16 (Y+R=4.0 sec) Average Delay (sec/veh):     231.3
Optimal Cycle:        180            Level Of Service:                  F
******************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:    L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Protected        Protected        Protected        Protected
Rights:          Include          Include          Include          Include
Min. Green:    0    0     0    0    0     0    0    0     0    0    0     0
Lanes:       1  0  1  1  0   1  0  2  0  1   2  0  1  1  0   1  0  1  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:     203 1374    77   427 1227    38   336 1486   154   121  517   551
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:  203 1374    77   427 1227    38   336 1486   154   121  517   551
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.92 0.92  0.92  0.92 0.92  0.92  0.92 0.92  0.92  0.92 0.92  0.92
PHF Volume:   221 1493    84   464 1334    41   365 1615   167   132  562   599
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:  221 1493    84   464 1334    41   365 1615   167   132  562   599
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:  221 1493    84   464 1334    41   365 1615   167   132  562   599
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1800 1800  1800  1800 1800  1800  1800 1800  1800  1800 1800  1800
Adjustment:  0.92 0.92  0.91  0.93 0.93  0.82  0.91 0.93  0.93  0.94 0.87  0.86
Lanes:       1.00 1.89  0.11  1.00 2.00  1.00  2.00 1.81  0.19  1.00 1.00  1.00
Final Sat.:  1660 3119   175  1676 3352  1472  3284 3025   313  1693 1563  1550
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.13 0.48  0.48  0.28 0.40  0.03  0.11 0.53  0.53  0.08 0.36  0.39
Crit Moves:       ****        ****                  ****        ****
Green/Cycle: 0.12 0.31  0.31  0.18 0.36  0.36  0.09 0.34  0.34  0.05 0.30  0.30
Volume/Cap:  1.10 1.57  1.57  1.57 1.10  0.08  1.28 1.57  1.57  1.57 1.19  1.28
Delay/Veh:  148.3  304 303.9 322.9 98.2  26.3 205.3  301 301.2 364.7  138 176.1
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh: 148.3  304 303.9 322.9 98.2  26.3 205.3  301 301.2 364.7  138 176.1
LOS by Move:    F    F     F     F    F     C     F    F     F     F    F     F
HCM2kAvgQ:     14   69    69    40   39     1    15   78    78    13   37    43
******************************************************************************
Note: Queue reported is the number of cars per lane.
******************************************************************************
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--------------------------------------------------------------------------------
                     Evergreen/Helvetia Conceptual Design Plan
                                   PM Peak Hour
                          Future Build Conditions (2030)
--------------------------------------------------------------------------------

                        Level Of Service Computation Report
            2000 HCM Unsignalized Method (Base Volume Alternative)
********************************************************************************
Intersection #9 NW Jackson School Rd/Hwy 26 WB Ramp
********************************************************************************
Average Delay (sec/veh):    344.8       Worst Case Level Of Service: F[601.8]
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Rights:           Include          Include          Include          Include
Lanes:        1  0  1  0  0   0  0  1  0  1   0  0  0  0  0   0  1  0  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:     106  323     0     0  385     5     0    0     0   690    1   404
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:  106  323     0     0  385     5     0    0     0   690    1   404
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.92 0.92  0.92  0.92 0.92  0.92  0.92 0.92  0.92  0.92 0.92  0.92
PHF Volume:   115  351     0     0  418     5     0    0     0   750    1   439
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
FinalVolume:  115  351     0     0  418     5     0    0     0   750    1   439
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:  4.1 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx   6.4  6.5   6.2
FollowUpTim:  2.2 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx   3.5  4.0   3.3
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol:  424 xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  1003 1005   351
Potent Cap.: 1146 xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx   271  243   697
Move Cap.:   1146 xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx   250  219   697
Volume/Cap:  0.10 xxxx  xxxx  xxxx xxxx  xxxx  xxxx xxxx  xxxx  3.00 0.00  0.63
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
2Way95thQ:    0.3 xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx   4.5
Control Del:  8.5 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx  18.5
LOS by Move:    A    *     *     *    *     *     *    *     *     *    *     C
Movement:     LT - LTR - RT   LT - LTR - RT   LT - LTR - RT   LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx   250 xxxx xxxxx
SharedQueue:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx  66.9 xxxx xxxxx
Shrd ConDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx 942.9 xxxx xxxxx
Shared LOS:     *    *     *     *    *     *     *    *     *     F    *     *
ApproachDel:     xxxxxx           xxxxxx           xxxxxx            601.8
ApproachLOS:        *                *                *                F
********************************************************************************
Note: Queue reported is the number of cars per lane.
********************************************************************************
```



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--------------------------------------------------------------------------------
                     Evergreen/Helvetia Conceptual Design Plan
                                   PM Peak Hour
                          Future Build Conditions (2030)
--------------------------------------------------------------------------------

                        Level Of Service Computation Report
            2000 HCM Unsignalized Method (Base Volume Alternative)
********************************************************************************
Intersection #10 NW Jackson School Rd/Hwy 26 EB Ramp
********************************************************************************
Average Delay (sec/veh):      2.7       Worst Case Level Of Service: E[ 44.5]
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Rights:           Include          Include          Include          Include
Lanes:        0  0  1  0  1   1  0  1  0  0   0  1  0  0  1   0  0  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       0  280   971   213  811     0     5    2    50     0    0     0
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    0  280   971   213  811     0     5    2    50     0    0     0
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.92 0.92  0.92  0.92 0.92  0.92  0.92 0.92  0.92  0.92 0.92  0.92
PHF Volume:     0  304  1055   232  882     0     5    2    54     0    0     0
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
FinalVolume:    0  304  1055   232  882     0     5    2    54     0    0     0
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:xxxxx xxxx xxxxx   4.1 xxxx xxxxx   6.4  6.5   6.2 xxxxx xxxx xxxxx
FollowUpTim:xxxxx xxxx xxxxx   2.2 xxxx xxxxx   3.5  4.0   3.3 xxxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: xxxx xxxx xxxxx  1360 xxxx xxxxx  2177 2704   882  xxxx xxxx xxxxx
Potent Cap.: xxxx xxxx xxxxx   512 xxxx xxxxx    52   22   348  xxxx xxxx xxxxx
Move Cap.:   xxxx xxxx xxxxx   512 xxxx xxxxx    33   12   348  xxxx xxxx xxxxx
Volume/Cap:  xxxx xxxx  xxxx  0.45 xxxx  xxxx  0.16 0.18  0.16  xxxx xxxx  xxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
2Way95thQ:   xxxx xxxx xxxxx   2.3 xxxx xxxxx  xxxx xxxx   0.5  xxxx xxxx xxxxx
Control Del:xxxxx xxxx xxxxx  17.7 xxxx xxxxx xxxxx xxxx  17.2 xxxxx xxxx xxxxx
LOS by Move:    *    *     *     C    *     *     *    *     C     *    *     *
Movement:     LT - LTR - RT   LT - LTR - RT   LT - LTR - RT   LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx    22 xxxx xxxxx  xxxx xxxx xxxxx
SharedQueue:xxxxx xxxx xxxxx xxxxx xxxx xxxxx   1.0 xxxx xxxxx xxxxx xxxx xxxxx
Shrd ConDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx 239.6 xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS:     *    *     *     *    *     *     F    *     *     *    *     *
ApproachDel:     xxxxxx           xxxxxx             44.5           xxxxxx
ApproachLOS:        *                *                E                *
********************************************************************************
Note: Queue reported is the number of cars per lane.
********************************************************************************
```

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---------------------------------------------------------------------------
               Evergreen/Helvetia Conceptual Design Plan
                             PM Peak Hour
                    Future Build Conditions (2030)
---------------------------------------------------------------------------
                  Level Of Service Computation Report
          2000 HCM Unsignalized Method (Base Volume Alternative)
***************************************************************************
Intersection #11 NW Jackson School Rd/NW Meek Rd
***************************************************************************
Average Delay (sec/veh):     36.2      Worst Case Level Of Service: F[305.6]
***************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:    L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Rights:           Include          Include          Include          Include
Lanes:       0  0  0  1  0   0  1  0  0  0   0  0  0  0  0   0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       0  953     5    94  601     0     0    0     0    54    0   164
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    0  953     5    94  601     0     0    0     0    54    0   164
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.92 0.92  0.92  0.92 0.92  0.92  0.92 0.92  0.92  0.92 0.92  0.92
PHF Volume:     0 1036     5   102  653     0     0    0     0    59    0   178
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
FinalVolume:    0 1036     5   102  653     0     0    0     0    59    0   178
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:xxxxx xxxx xxxxx   4.1 xxxx xxxxx xxxxx xxxx xxxxx   6.4  6.5   6.2
FollowUpTim:xxxxx xxxx xxxxx   2.2 xxxx xxxxx xxxxx xxxx xxxxx   3.5  4.0   3.3
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: xxxx xxxx xxxxx  1041 xxxx xxxxx  xxxx xxxx xxxxx  1896 1896  1039
Potent Cap.: xxxx xxxx xxxxx   676 xxxx xxxxx  xxxx xxxx xxxxx    77   70   283
Move Cap.:   xxxx xxxx xxxxx   676 xxxx xxxxx  xxxx xxxx xxxxx    68   59   283
Volume/Cap:  xxxx xxxx  xxxx  0.15 xxxx  xxxx  xxxx xxxx  xxxx  0.86 0.00  0.63
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
2Way95thQ:   xxxx xxxx xxxxx   0.5 xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Control Del:xxxxx xxxx xxxxx  11.3 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:    *    *     *     B    *     *     *    *     *     *    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx  158 xxxxx
SharedQueue:xxxxx xxxx xxxxx   0.5 xxxx xxxxx xxxxx xxxx xxxxx xxxxx 15.5 xxxxx
Shrd ConDel:xxxxx xxxx xxxxx  11.3 xxxx xxxxx xxxxx xxxx xxxxx xxxxx  306 xxxxx
Shared LOS:     *    *     *     B    *     *     *    *     *     *    F     *
ApproachDel:     xxxxxx           xxxxxx           xxxxxx            305.6
ApproachLOS:        *                *                *                F
***************************************************************************
Note: Queue reported is the number of cars per lane.
***************************************************************************
```



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---------------------------------------------------------------------------
               Evergreen/Helvetia Conceptual Design Plan
                             PM Peak Hour
                    Future Build Conditions (2030)
---------------------------------------------------------------------------
                  Level Of Service Computation Report
          2000 HCM Unsignalized Method (Base Volume Alternative)
***************************************************************************
Intersection #15 NW Helvetia Rd/NW Jacobson Rd
***************************************************************************
Average Delay (sec/veh):     78.4      Worst Case Level Of Service: F[746.2]
***************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:    L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Rights:           Include          Include          Include          Include
Lanes:       0  0  1! 0  0   0  0  1! 0  0   0  0  1! 0  0   0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       6  596   382     9  637     2     3    1     4   188    1     3
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    6  596   382     9  637     2     3    1     4   188    1     3
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.92 0.92  0.92  0.92 0.92  0.92  0.92 0.92  0.92  0.92 0.92  0.92
PHF Volume:     7  648   415    10  692     2     3    1     4   204    1     3
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
FinalVolume:    7  648   415    10  692     2     3    1     4   204    1     3
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:  4.1 xxxx xxxxx   4.1 xxxx xxxxx   7.1  6.5   6.2   7.1  6.5   6.2
FollowUpTim:  2.2 xxxx xxxxx   2.2 xxxx xxxxx   3.5  4.0   3.3   3.5  4.0   3.3
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol:  695 xxxx xxxxx  1063 xxxx xxxxx  1584 1789   693  1584 1583   855
Potent Cap.:  910 xxxx xxxxx   663 xxxx xxxxx    89   82   447    89  110   361
Move Cap.:    910 xxxx xxxxx   663 xxxx xxxxx    86   80   447    85  107   361
Volume/Cap:  0.01 xxxx  xxxx  0.01 xxxx  xxxx  0.04 0.01  0.01  2.39 0.01  0.01
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
2Way95thQ:    0.0 xxxx xxxxx   0.0 xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Control Del:  9.0 xxxx xxxxx  10.5 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:    A    *     *     B    *     *     *    *     *     *    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx  142 xxxxx  xxxx   87 xxxxx
SharedQueue:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx  0.2 xxxxx xxxxx 19.3 xxxxx
Shrd ConDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx 32.0 xxxxx xxxxx  746 xxxxx
Shared LOS:     *    *     *     *    *     *     *    D     *     *    F     *
ApproachDel:     xxxxxx           xxxxxx             32.0            746.2
ApproachLOS:        *                *                D                F
***************************************************************************
Note: Queue reported is the number of cars per lane.
***************************************************************************
```

Evergreen/Helvetia Conceptual Design Plan
PM Peak Hour
Future Build Conditions (2030)

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

Intersection #16 NW Shute Rd/Hwy 26 WB Ramp

Cycle (sec): 70 Critical Vol./Cap.(X): 0.957
Loss Time (sec): 12 (Y+R=4.0 sec) Average Delay (sec/veh): 35.1
Optimal Cycle: 110 Level Of Service: D

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:		Protected			Protected			Protected			Protected	
Rights:		Include			Include			Include			Include	
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:		1 0 1 0 0			0 0 1 1 0			0 0 0 0 0			1 1 0 0 1	
Volume Module:												
Base Vol:	347	878	0	0	551	111	0	0	0	749	0	60
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	347	878	0	0	551	111	0	0	0	749	0	60
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
PHF Volume:	377	954	0	0	599	121	0	0	0	814	0	65
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	377	954	0	0	599	121	0	0	0	814	0	65
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	377	954	0	0	599	121	0	0	0	814	0	65
Saturation Flow Module:												
Sat/Lane:	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Adjustment:	0.92	0.97	1.00	1.00	0.89	0.89	1.00	1.00	1.00	0.92	1.00	0.82
Lanes:	1.00	1.00	0.00	0.00	1.66	0.34	0.00	0.00	0.00	2.00	0.00	1.00
Final Sat.:	1660	1748	0	0	2668	537	0	0	0	3297	0	1472
Capacity Analysis Module:												
Vol/Sat:	0.23	0.55	0.00	0.00	0.22	0.22	0.00	0.00	0.00	0.25	0.00	0.04
Crit Moves:		****		****						****		
Green/Cycle:	0.29	0.57	0.00	0.00	0.28	0.28	0.00	0.00	0.00	0.26	0.00	0.26
Volume/Cap:	0.79	0.96	0.00	0.00	0.79	0.79	0.00	0.00	0.00	0.96	0.00	0.17
Delay/Veh:	31.8	33.1	0.0	0.0	27.9	27.9	0.0	0.0	0.0	46.6	0.0	20.4
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	31.8	33.1	0.0	0.0	27.9	27.9	0.0	0.0	0.0	46.6	0.0	20.4
LOS by Move:	C	C	A	A	C	C	A	A	A	D	A	C
HCM2kAvgQ:	10	26	0	0	10	10	0	0	0	14	0	1

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

Evergreen/Helvetia Conceptual Design Plan
PM Peak Hour
Future Build Conditions (2030)

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

Intersection #17 NW Shute Rd/Hwy 26 EB Ramp

Cycle (sec): 70 Critical Vol./Cap.(X): 1.281
Loss Time (sec): 12 (Y+R=4.0 sec) Average Delay (sec/veh): 97.6
Optimal Cycle: 180 Level Of Service: F

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:		Protected			Protected			Protected			Protected	
Rights:		Ignore			Include			Include			Include	
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:		0 0 1 0 1			1 0 2 0 0			0 1 0 0 1			0 0 0 0 0	
Volume Module:												
Base Vol:	0	1281	817	229	1089	0	45	1	192	0	0	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	1281	817	229	1089	0	45	1	192	0	0	0
User Adj:	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.93	0.93	0.00	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
PHF Volume:	0	1377	0	246	1171	0	48	1	206	0	0	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	0	1377	0	246	1171	0	48	1	206	0	0	0
PCE Adj:	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	0	1377	0	246	1171	0	48	1	206	0	0	0
Saturation Flow Module:												
Sat/Lane:	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Adjustment:	1.00	0.99	1.00	0.92	0.92	1.00	0.94	0.94	0.82	1.00	1.00	1.00
Lanes:	0.00	1.00	1.00	1.00	2.00	0.00	0.98	0.02	1.00	0.00	0.00	0.00
Final Sat.:	0	1782	1800	1660	3321	0	1647	37	1472	0	0	0
Capacity Analysis Module:												
Vol/Sat:	0.00	0.77	0.00	0.15	0.35	0.00	0.03	0.03	0.14	0.00	0.00	0.00
Crit Moves:		****		****					****			
Green/Cycle:	0.00	0.60	0.00	0.12	0.72	0.00	0.11	0.11	0.11	0.00	0.00	0.00
Volume/Cap:	0.00	1.28	0.00	1.28	0.49	0.00	0.27	0.27	1.28	0.00	0.00	0.00
Delay/Veh:	0.0	148	0.0	191.2	4.4	0.0	29.4	29.4	196.6	0.0	0.0	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	0.0	148	0.0	191.2	4.4	0.0	29.4	29.4	196.6	0.0	0.0	0.0
LOS by Move:	A	F	A	F	A	A	C	C	F	A	A	A
HCM2kAvgQ:	0	69	0	15	6	0	1	1	13	0	0	0

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

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------------------------------------------------------------------------------
                 Evergreen/Helvetia Conceptual Design Plan
                               PM Peak Hour
                      Future Build Conditions (2030)
------------------------------------------------------------------------------
                    Level Of Service Computation Report
           2000 HCM Unsignalized Method (Base Volume Alternative)
******************************************************************************
Intersection #18 NW Shute/NW Huffman St
******************************************************************************
Average Delay (sec/veh): OVERFLOW      Worst Case Level Of Service: F[xxxxx]
******************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Rights:           Include          Include          Include          Include
Lanes:        0  1  0  1  0   1  0  1  1  0   1  0  1  0  1   1  0  0  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      76 1579    41    65 1044   133   312   30   167    47   30    22
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   76 1579    41    65 1044   133   312   30   167    47   30    22
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.92 0.92  0.92  0.92 0.92  0.92  0.92 0.92  0.92  0.92 0.92  0.92
PHF Volume:    83 1716    45    71 1135   145   339   33   182    51   33    24
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
FinalVolume:   83 1716    45    71 1135   145   339   33   182    51   33    24
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:  4.1 xxxx xxxxx   4.1 xxxx xxxxx   7.5  6.5   6.9   7.5  6.5   6.9
FollowUpTim:  2.2 xxxx xxxxx   2.2 xxxx xxxxx   3.5  4.0   3.3   3.5  4.0   3.3
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: 1279 xxxx xxxxx  1761 xxxx xxxxx  2388 3274   640  2629 3324   880
Potent Cap.:  549 xxxx xxxxx   360 xxxx xxxxx    18    9   423    12    8   294
Move Cap.:    549 xxxx xxxxx   360 xxxx xxxxx     0    6   423     0    6   294
Volume/Cap:  0.15 xxxx  xxxx  0.20 xxxx  xxxx  xxxx 5.32  0.43  xxxx 5.74  0.08
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
2Way95thQ:    0.5 xxxx xxxxx   0.7 xxxx xxxxx  xxxx  5.5   2.1  xxxx xxxx xxxxx
Control Del: 12.7 xxxx xxxxx  17.4 xxxx xxxxx xxxxx 3098  19.7 xxxxx xxxx xxxxx
LOS by Move:    B    *     *     C    *     *     *    F     C     *    *     *
Movement:     LT - LTR - RT   LT - LTR - RT   LT - LTR - RT   LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx    10
SharedQueue:  0.5 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx   8.4
Shrd ConDel: 12.7 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx  2928
Shared LOS:     B    *     *     *    *     *     *    *     *     *    *     F
ApproachDel:      xxxxxx           xxxxxx           xxxxxx           xxxxxx
ApproachLOS:         *                *                F                F
******************************************************************************
Note: Queue reported is the number of cars per lane.
******************************************************************************
```



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------------------------------------------------------------------------------
                 Evergreen/Helvetia Conceptual Design Plan
                               PM Peak Hour
                      Future Build Conditions (2030)
------------------------------------------------------------------------------
                    Level Of Service Computation Report
           2000 HCM Operations Method (Base Volume Alternative)
******************************************************************************
Intersection #19 NW Shute Rd/NE Shute Rd
******************************************************************************
Cycle (sec):          110                Critical Vol./Cap.(X):         0.787
Loss Time (sec):       12 (Y+R=4.0 sec)  Average Delay (sec/veh):        17.4
Optimal Cycle:         76                Level Of Service:                  B
******************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected       Split Phase      Split Phase
Rights:           Include          Include          Include            Ovl
Min. Green:     0    0     0     0    0     0     0    0     0     0    0     0
Lanes:        0  0  1  1  0   1  0  2  0  0   0  0  0  0  0   1  0  0  0  2
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       0  582    60   770  894     0     0    0     0     7    0   600
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    0  582    60   770  894     0     0    0     0     7    0   600
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.92 0.92  0.92  0.92 0.92  0.92  0.92 0.92  0.92  0.92 0.92  0.92
PHF Volume:     0  633    65   837  972     0     0    0     0     8    0   652
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:    0  633    65   837  972     0     0    0     0     8    0   652
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:    0  633    65   837  972     0     0    0     0     8    0   652
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1800 1800  1800  1800 1800  1800  1800 1800  1800  1800 1800  1800
Adjustment:  1.00 0.94  0.94  0.95 0.95  1.00  1.00 1.00  1.00  0.95 1.00  0.75
Lanes:       0.00 1.81  0.19  1.00 2.00  0.00  0.00 0.00  0.00  1.00 0.00  2.00
Final Sat.:     0 3057   315  1710 3420     0     0    0     0  1710    0  2693
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.21  0.21  0.49 0.28  0.00  0.00 0.00  0.00  0.00 0.00  0.24
Crit Moves:       ****        ****                                ****
Green/Cycle: 0.00 0.26  0.26  0.62 0.89  0.00  0.00 0.00  0.00  0.01 0.00  0.63
Volume/Cap:  0.00 0.79  0.79  0.79 0.32  0.00  0.00 0.00  0.00  0.79 0.00  0.39
Delay/Veh:    0.0 42.4  42.4  19.3  1.1   0.0   0.0  0.0   0.0 220.8  0.0  10.2
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:   0.0 42.4  42.4  19.3  1.1   0.0   0.0  0.0   0.0 220.8  0.0  10.2
LOS by Move:    A    D     D     B    A     A     A    A     A     F    A     B
HCM2kAvgQ:      0   13    13    22    3     0     0    0     0     1    0     6
******************************************************************************
Note: Queue reported is the number of cars per lane.
******************************************************************************
```

Evergreen/Helvetia Conceptual Design Plan
PM Peak Hour
Future Build Conditions (2030)

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

Intersection #20 NE Brookwood Pkwy/NE Cornell Rd

Cycle (sec): 180   Critical Vol./Cap.(X): 1.447
Loss Time (sec): 16 (Y+R=4.0 sec)   Average Delay (sec/veh): 199.5
Optimal Cycle: 180   Level Of Service: F

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:		Protected			Protected			Protected			Protected	
Rights:		Include			Include			Include			Include	
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1 0 1 1 0			1 0 1 0 1			1 0 1 1 0			1 0 1 1 0		
Volume Module:												
Base Vol:	30	403	180	153	1009	294	236	1123	100	302	1531	209
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	30	403	180	153	1009	294	236	1123	100	302	1531	209
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	32	424	189	161	1062	309	248	1182	105	318	1612	220
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	32	424	189	161	1062	309	248	1182	105	318	1612	220
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	32	424	189	161	1062	309	248	1182	105	318	1612	220
Saturation Flow Module:												
Sat/Lane:	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Adjustment:	0.93	0.89	0.89	0.93	0.98	0.83	0.94	0.93	0.93	0.94	0.92	0.92
Lanes:	1.00	1.38	0.62	1.00	1.00	1.00	1.00	1.84	0.16	1.00	1.76	0.24
Final Sat.:	1676	2210	987	1676	1764	1499	1693	3072	274	1693	2925	399
Capacity Analysis Module:												
Vol/Sat:	0.02	0.19	0.19	0.10	0.60	0.21	0.15	0.38	0.38	0.19	0.55	0.55
Crit Moves:	****				****		****				****	
Green/Cycle:	0.01	0.29	0.29	0.14	0.42	0.42	0.10	0.32	0.32	0.16	0.38	0.38
Volume/Cap:	1.45	0.67	0.67	0.67	1.45	0.50	1.45	1.19	1.19	1.19	1.45	1.45
Delay/Veh:	442.1	58.8	58.8	80.3	261	39.3	311.7	155	154.8	191.4	262	261.5
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	442.1	58.8	58.8	80.3	261	39.3	311.7	155	154.8	191.4	262	261.5
LOS by Move:	F	E	E	F	F	D	F	F	F	F	F	F
HCM2kAvgQ:	4	16	16	9	97	12	25	52	52	26	88	88

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

Evergreen/Helvetia Conceptual Design Plan
PM Peak Hour
Future Build Conditions (2030)

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

Intersection #21 NE Brookwood Pkwy/W Baseline Rd

Cycle (sec): 95   Critical Vol./Cap.(X): 1.498
Loss Time (sec): 16 (Y+R=4.0 sec)   Average Delay (sec/veh): 179.9
Optimal Cycle: 180   Level Of Service: F

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:		Protected			Protected			Protected			Protected	
Rights:		Include			Include			Include			Include	
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1 0 0 1 0			1 0 1 0 1			1 0 1 0 1			1 0 0 1 0		
Volume Module:												
Base Vol:	193	352	85	83	614	122	120	680	202	587	485	82
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	193	352	85	83	614	122	120	680	202	587	485	82
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
PHF Volume:	201	367	89	86	640	127	125	708	210	611	505	85
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	201	367	89	86	640	127	125	708	210	611	505	85
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	201	367	89	86	640	127	125	708	210	611	505	85
Saturation Flow Module:												
Sat/Lane:	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Adjustment:	0.93	0.95	0.95	0.94	0.99	0.84	0.93	0.98	0.82	0.93	0.96	0.96
Lanes:	1.00	0.81	0.19	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.86	0.14
Final Sat.:	1676	1379	333	1693	1782	1515	1676	1764	1476	1676	1476	249
Capacity Analysis Module:												
Vol/Sat:	0.12	0.27	0.27	0.05	0.36	0.08	0.07	0.40	0.14	0.36	0.34	0.34
Crit Moves:	****				****			****		****		
Green/Cycle:	0.08	0.27	0.27	0.05	0.24	0.24	0.09	0.27	0.27	0.24	0.42	0.42
Volume/Cap:	1.50	0.99	0.99	0.99	1.50	0.35	0.81	1.50	0.53	1.50	0.81	0.81
Delay/Veh:	302.5	74.2	74.2	138.3	272	30.6	69.7	270	31.1	272.4	31.4	31.4
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	302.5	74.2	74.2	138.3	272	30.6	69.7	270	31.1	272.4	31.4	31.4
LOS by Move:	F	E	E	F	F	C	E	F	C	F	C	C
HCM2kAvgQ:	16	19	19	6	46	3	6	51	6	44	17	17

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

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---------------------------------------------------------------------------
                 Evergreen/Helvetia Conceptual Design Plan
                              PM Peak Hour
                      Future Build Conditions (2030)
---------------------------------------------------------------------------
                    Level Of Service Computation Report
           2000 HCM Unsignalized Method (Base Volume Alternative)
***************************************************************************
Intersection #22 NW Jacobson Rd/NW Century Blvd
***************************************************************************
Average Delay (sec/veh): OVERFLOW      Worst Case Level Of Service: F[xxxxx]
***************************************************************************
Approach:     North Bound      South Bound       East Bound       West Bound
Movement:    L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Stop Sign        Stop Sign       Uncontrolled     Uncontrolled
Rights:          Include          Include          Include          Include
Lanes:       0  1  0  1  0   0  0  0  1  0   0  0  1! 0  0   0  1  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:     334  269   368     0  138     1    51  412   245   256   78     0
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:  334  269   368     0  138     1    51  412   245   256   78     0
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.92 0.92  0.92  0.92 0.92  0.92  0.92 0.92  0.92  0.92 0.92  0.92
PHF Volume:   363  292   400     0  150     1    55  448   266   278   85     0
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
FinalVolume:  363  292   400     0  150     1    55  448   266   278   85     0
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:  7.1  6.5   6.2 xxxxx  6.5   6.2   4.1 xxxx xxxxx   4.1 xxxx xxxxx
FollowUpTim:  3.5  4.0   3.3 xxxxx  4.0   3.3   2.2 xxxx xxxxx   2.2 xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: 1409 1333   581  xxxx 1466    85    85 xxxx xxxxx   714 xxxx xxxxx
Potent Cap.:  117  155   517  xxxx  129   980  1525 xxxx xxxxx   895 xxxx xxxxx
Move Cap.:      0   95   517  xxxx   79   980  1525 xxxx xxxxx   895 xxxx xxxxx
Volume/Cap:  xxxx 3.09  0.77  xxxx 1.91  0.00  0.04 xxxx  xxxx  0.31 xxxx  xxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
2Way95thQ:   xxxx xxxx xxxxx  xxxx xxxx xxxxx   0.1 xxxx xxxxx   1.3 xxxx xxxxx
Control Del:xxxxx xxxx xxxxx xxxxx xxxx xxxxx   7.5 xxxx xxxxx  10.8 xxxx xxxxx
LOS by Move:    *    *     *     *    *     *     A    *     *     B    *     *
Movement:    LT - LTR - RT   LT - LTR - RT   LT - LTR - RT   LT - LTR - RT
Shared Cap.:    0 xxxx   179  xxxx xxxx    79  xxxx xxxx xxxxx  xxxx xxxx xxxxx
SharedQueue:xxxxx xxxx  68.0 xxxxx xxxx  13.3 xxxxx xxxx xxxxx   1.3 xxxx xxxxx
Shrd ConDel:xxxxx xxxx  1340 xxxxx xxxx 539.3 xxxxx xxxx xxxxx  10.8 xxxx xxxxx
Shared LOS:     *    *     F     *    *     F     *    *     *     B    *     *
ApproachDel:     xxxxxx           539.3            xxxxxx           xxxxxx
ApproachLOS:        F                F                *                *
***************************************************************************
Note: Queue reported is the number of cars per lane.
***************************************************************************
```



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---------------------------------------------------------------------------
                 Evergreen/Helvetia Conceptual Design Plan
                              PM Peak Hour
                      Future Build Conditions (2030)
---------------------------------------------------------------------------
                    Level Of Service Computation Report
           2000 HCM Operations Method (Base Volume Alternative)
***************************************************************************
Intersection #23 NW Cornelius Pass Rd/NW Jacobson Rd
***************************************************************************
Cycle (sec):          70              Critical Vol./Cap.(X):         1.234
Loss Time (sec):      16 (Y+R=4.0 sec)  Average Delay (sec/veh):       99.9
Optimal Cycle:       180              Level Of Service:                  F
***************************************************************************
Approach:     North Bound      South Bound       East Bound       West Bound
Movement:    L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected        Protected        Protected
Rights:           Include          Include          Include          Include
Min. Green:     0    0     0     0    0     0     0    0     0     0    0     0
Lanes:       1  0  1  1  0   1  0  1  1  0   1  0  0  1  0   1  0  0  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:     114 1439   102    17  653    92   674  239   240    24   20     8
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:  114 1439   102    17  653    92   674  239   240    24   20     8
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.92 0.92  0.92  0.92 0.92  0.92  0.92 0.92  0.92  0.92 0.92  0.92
PHF Volume:   124 1564   111    18  710   100   733  260   261    26   22     9
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:  124 1564   111    18  710   100   733  260   261    26   22     9
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:  124 1564   111    18  710   100   733  260   261    26   22     9
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1800 1800  1800  1800 1800  1800  1800 1800  1800  1800 1800  1800
Adjustment:  0.95 0.94  0.94  0.95 0.93  0.93  0.95 0.93  0.92  0.95 0.96  0.96
Lanes:       1.00 1.87  0.13  1.00 1.75  0.25  1.00 0.50  0.50  1.00 0.71  0.29
Final Sat.:  1710 3161   224  1710 2942   415  1710  831   834  1710 1230   492
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.07 0.49  0.49  0.01 0.24  0.24  0.43 0.31  0.31  0.02 0.02  0.02
Crit Moves:       ****        ****              ****                  ****
Green/Cycle: 0.09 0.40  0.40  0.01 0.32  0.32  0.35 0.34  0.34  0.02 0.01  0.01
Volume/Cap:  0.77 1.23  1.23  1.23 0.77  0.77  1.23 0.91  0.91  0.91 1.23  1.23
Delay/Veh:   50.3  133 132.7 350.9 25.0  25.0 142.1 40.1  40.1 162.5  295 295.1
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:  50.3  133 132.7 350.9 25.0  25.0 142.1 40.1  40.1 162.5  295 295.1
LOS by Move:    D    F     F     F    C     C     F    D     D     F    F     F
HCM2kAvgQ:      5   42    42     2   10    10    36   15    15     2    3     3
***************************************************************************
Note: Queue reported is the number of cars per lane.
***************************************************************************
```

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--------------------------------------------------------------------------------
                   Evergreen/Helvetia Conceptual Design Plan
                                PM Peak Hour
                        Future Build Conditions (2030)
--------------------------------------------------------------------------------
                      Level Of Service Computation Report
             2000 HCM 4-Way Stop Method (Base Volume Alternative)
********************************************************************************
Intersection #325 NW Helvetia Rd/West Union Rd
********************************************************************************
Cycle (sec):         100              Critical Vol./Cap.(X):        0.842
Loss Time (sec):       0 (Y+R=4.0 sec)  Average Delay (sec/veh):       26.5
Optimal Cycle:         0              Level Of Service:                 D
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Stop Sign        Stop Sign        Stop Sign        Stop Sign
Rights:           Include          Include          Include          Include
Min. Green:    0    0     0     0    0     0     0    0     0     0    0     0
Lanes:       0  0  1! 0  0    0  0  1! 0  0    0  0  1! 0  0    0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      41  105   297    25   57    14    34  186    45   117  239    75
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   41  105   297    25   57    14    34  186    45   117  239    75
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.92 0.92  0.92  0.92 0.92  0.92  0.92 0.92  0.92  0.92 0.92  0.92
PHF Volume:    45  114   323    27   62    15    37  202    49   127  260    82
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:   45  114   323    27   62    15    37  202    49   127  260    82
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:   45  114   323    27   62    15    37  202    49   127  260    82
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Adjustment:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Lanes:       0.09 0.24  0.67  0.26 0.59  0.15  0.13 0.70  0.17  0.27 0.56  0.17
Final Sat.:    53  137   387   110  252    62    64  352    85   151  309    97
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.83 0.83  0.83  0.25 0.25  0.25  0.57 0.57  0.57  0.84 0.84  0.84
Crit Moves:             ****       ****             ****             ****
Delay/Veh:   30.0 30.0  30.0  12.3 12.3  12.3  17.0 17.0  17.0  32.0 32.0  32.0
Delay Adj:   1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:  30.0 30.0  30.0  12.3 12.3  12.3  17.0 17.0  17.0  32.0 32.0  32.0
LOS by Move:    D    D     D     B    B     B     C    C     C     D    D     D
ApproachDel:      30.0             12.3             17.0             32.0
Delay Adj:        1.00             1.00             1.00             1.00
ApprAdjDel:       30.0             12.3             17.0             32.0
LOS by Appr:         D                B                C                D
AllWayAvgQ:    3.3  3.3   3.3   0.2  0.2   0.2   1.0  1.0   1.0   3.5  3.5   3.5
********************************************************************************
Note: Queue reported is the number of cars per lane.
********************************************************************************
```

Evergreen/Helvetia Conceptual Design Plan
PM Peak Hour
Future Mitigated No Build Conditions (2030)

Scenario Report

Scenario:	2030 Mitigated No Build PM Peak
Command:	Default Command
Volume:	Default Volume
Geometry:	Default Geometry
Impact Fee:	Default Impact Fee
Trip Generation:	Default Trip Generation
Trip Distribution:	Default Trip Distribution
Paths:	Default Path
Routes:	Default Route
Configuration:	Default Configuration

Evergreen/Helvetia Conceptual Design Plan
PM Peak Hour
Future Mitigated No Build Conditions (2030)

Impact Analysis Report
Level Of Service

Intersection	Base LOS	Base Del/Veh	Base V/C	Future LOS	Future Del/Veh	Future V/C	Change in
# 1 NW Glencoe Rd/NW Evergreen Rd	C	22.1	0.714	C	22.1	0.714	+ 0.000 D/V
# 2 NE Jackson School Rd/NW Evergr	B	16.7	0.705	B	16.7	0.705	+ 0.000 D/V
# 3 NW Jackson School Rd/NW Evergr	D	36.5	0.933	D	36.5	0.933	+ 0.000 D/V
# 5 NW Sewell Rd/NW Evergreen Rd	F	72.6	0.000	F	72.6	0.000	+ 0.000 D/V
# 6 NW SHute Rd/NW Evergreen Pkwy	D	50.7	0.947	D	50.7	0.947	+ 0.000 D/V
# 7 NW 229th Ave/NW Evergreen Rd	D	49.0	0.963	D	49.0	0.963	+ 0.000 D/V
# 8 NW Cornelius Pass Rd/NW Evergr	D	51.1	0.964	D	51.1	0.964	+ 0.000 D/V
# 9 NW Jackson School Rd/Hwy 26 WB	C	24.3	0.649	C	24.3	0.649	+ 0.000 D/V
# 15 NW Helvetia Rd/NW Jacobson Rd	B	17.6	0.795	B	17.6	0.795	+ 0.000 D/V
# 17 NW Shute Rd/Hwy 26 EB Ramp	B	19.6	0.647	B	19.6	0.647	+ 0.000 D/V
# 18 NW Shute/NW Huffman St	A	9.3	0.751	A	9.3	0.751	+ 0.000 D/V
# 20 NE Brookwood Pkwy/NE Cornell R	D	51.7	0.969	D	51.7	0.969	+ 0.000 D/V
# 21 NE Brookwood Pkwy/W Baseline R	D	43.2	0.848	D	43.2	0.848	+ 0.000 D/V
# 22 NW Jacobson Rd/NW Century Blvd	D	42.5	0.839	D	42.5	0.839	+ 0.000 D/V
# 23 NW Cornelius Pass Rd/NW Jacobs	D	41.6	0.938	D	41.6	0.938	+ 0.000 D/V

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--------------------------------------------------------------------------------
              Evergreen/Helvetia Conceptual Design Plan
                          PM Peak Hour
             Future Mitigated No Build Conditions (2030)
--------------------------------------------------------------------------------
                  Level Of Service Computation Report
        2000 HCM Operations Method (Base Volume Alternative)
********************************************************************************
Intersection #1 NW Glencoe Rd/NW Evergreen Rd
********************************************************************************
Cycle (sec):          90             Critical Vol./Cap.(X):        0.714
Loss Time (sec):      12 (Y+R=4.0 sec) Average Delay (sec/veh):     22.1
Optimal Cycle:        60             Level Of Service:                 C
********************************************************************************
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Protected        Protected        Protected        Protected
Rights:           Ovl            Include          Include          Include
Min. Green:    0    0    0    0    0    0    0    0    0    0    0    0
Lanes:       0  0  1  0  1   1  0  1  0  0   0  0  0  0  0   2  0  0  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      0  462   473   169  427     0     0    0     0   751    0   221
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   0  462   473   169  427     0     0    0     0   751    0   221
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.94 0.94  0.94  0.94 0.94  0.94  0.94 0.94  0.94  0.94 0.94  0.94
PHF Volume:    0  491   503   180  454     0     0    0     0   799    0   235
Reduct Vol:    0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:   0  491   503   180  454     0     0    0     0   799    0   235
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:   0  491   503   180  454     0     0    0     0   799    0   235
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1800 1800  1800  1800 1800  1800  1800 1800  1800  1800 1800  1800
Adjustment:  1.00 1.00  0.85  0.95 1.00  1.00  1.00 1.00  1.00  0.92 1.00  0.85
Lanes:       0.00 1.00  1.00  1.00 1.00  0.00  0.00 0.00  0.00  2.00 0.00  1.00
Final Sat.:    0 1800  1530  1710 1800     0     0    0     0  3317    0  1530
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.27  0.33  0.11 0.25  0.00  0.00 0.00  0.00  0.24 0.00  0.15
Crit Moves:       ****        ****                              ****
Green/Cycle: 0.00 0.38  0.72  0.15 0.53  0.00  0.00 0.00  0.00  0.34 0.00  0.34
Volume/Cap:  0.00 0.71  0.46  0.71 0.48  0.00  0.00 0.00  0.00  0.71 0.00  0.46
Delay/Veh:    0.0 27.2   5.6  45.9 13.7   0.0   0.0  0.0   0.0  28.3  0.0  24.0
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:   0.0 27.2   5.6  45.9 13.7   0.0   0.0  0.0   0.0  28.3  0.0  24.0
LOS by Move:   A    C     A     D    B     A     A    A     A     C    A     C
HCM2kAvgQ:     0   13     6     6    8     0     0    0     0    11    0     5
********************************************************************************
Note: Queue reported is the number of cars per lane.
********************************************************************************
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--------------------------------------------------------------------------------
              Evergreen/Helvetia Conceptual Design Plan
                          PM Peak Hour
             Future Mitigated No Build Conditions (2030)
--------------------------------------------------------------------------------
                  Level Of Service Computation Report
        2000 HCM Operations Method (Base Volume Alternative)
********************************************************************************
Intersection #2 NE Jackson School Rd/NW Evergreen Rd
********************************************************************************
Cycle (sec):          90             Critical Vol./Cap.(X):        0.705
Loss Time (sec):      12 (Y+R=4.0 sec) Average Delay (sec/veh):     16.7
Optimal Cycle:        59             Level Of Service:                 B
********************************************************************************
Street Name:    Jackson School - driveway
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:      Split Phase      Split Phase       Protected        Protected
Rights:           Ovl            Include          Include          Include
Min. Green:    0    0    0    0    0    0    0    0    0    0    0    0
Lanes:       0  1  0  0  1   0  0  1! 0  0   1  0  1  1  0   1  0  1  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:     98    0   446     0    0     0     0  586   124   477 1120     0
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:  98    0   446     0    0     0     0  586   124   477 1120     0
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.92 0.92  0.92  0.92 0.92  0.92  0.92 0.92  0.92  0.92 0.92  0.92
PHF Volume:  107    0   485     0    0     0     0  637   135   518 1217     0
Reduct Vol:    0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol: 107    0   485     0    0     0     0  637   135   518 1217     0
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume: 107    0   485     0    0     0     0  637   135   518 1217     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1800 1800  1800  1800 1800  1800  1800 1800  1800  1800 1800  1800
Adjustment:  0.94 1.00  0.84  1.00 1.00  1.00  1.00 0.90  0.89  0.93 0.93  0.95
Lanes:       1.00 0.00  1.00  0.00 1.00  0.00  1.00 1.65  0.35  1.00 2.00  0.00
Final Sat.:  1696    0  1515     0 1800     0  1800 2668   565  1676 3352     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.06 0.00  0.32  0.00 0.00  0.00  0.00 0.24  0.24  0.31 0.36  0.00
Crit Moves:  ****                                   ****        ****
Green/Cycle: 0.09 0.00  0.53  0.00 0.00  0.00  0.00 0.34  0.34  0.44 0.78  0.00
Volume/Cap:  0.70 0.00  0.61  0.00 0.00  0.00  0.00 0.70  0.70  0.70 0.47  0.00
Delay/Veh:   53.9  0.0  16.1   0.0  0.0   0.0   0.0 28.0  28.0  23.6  3.6   0.0
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:  53.9  0.0  16.1   0.0  0.0   0.0   0.0 28.0  28.0  23.6  3.6   0.0
LOS by Move:   D    A     B     A    A     A     A    C     C     C    A     A
HCM2kAvgQ:     4    0    10     0    0     0     0   11    11    13    6     0
********************************************************************************
Note: Queue reported is the number of cars per lane.
********************************************************************************
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Evergreen/Helvetia Conceptual Design Plan
PM Peak Hour
Future Mitigated No Build Conditions (2030)

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

Intersection #3 NW Jackson School Rd/NW Evergreen Rd

Cycle (sec): 90 | Critical Vol./Cap.(X): 0.933
Loss Time (sec): 12 (Y+R=4.0 sec) | Average Delay (sec/veh): 36.5
Optimal Cycle: 119 | Level Of Service: D

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Protected			Protected		
Rights:	Include			Ovl			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0 0 1! 0 0			0 1 0 0 1			1 0 1 1 0			1 0 2 0 1		
Volume Module:												
Base Vol:	2	1	2	151	2	555	496	535	3	9	1095	464
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	2	1	2	151	2	555	496	535	3	9	1095	464
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
PHF Volume:	2	1	2	164	2	603	539	582	3	10	1190	504
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	2	1	2	164	2	603	539	582	3	10	1190	504
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	2	1	2	164	2	603	539	582	3	10	1190	504
Saturation Flow Module:												
Sat/Lane:	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Adjustment:	0.86	0.86	0.86	0.68	0.69	0.82	0.93	0.93	0.93	0.94	0.94	0.82
Lanes:	0.40	0.20	0.40	0.99	0.01	1.00	1.00	1.99	0.01	1.00	2.00	1.00
Final Sat.:	620	310	620	1215	16	1472	1676	3330	19	1693	3386	1481
Capacity Analysis Module:												
Vol/Sat:	0.00	0.00	0.00	0.14	0.14	0.41	0.32	0.17	0.17	0.01	0.35	0.34
Crit Moves:					****		****				****	
Green/Cycle:	0.14	0.14	0.14	0.14	0.14	0.49	0.34	0.70	0.70	0.02	0.38	0.38
Volume/Cap:	0.02	0.02	0.02	0.93	0.93	0.84	0.93	0.25	0.25	0.25	0.93	0.90
Delay/Veh:	33.1	33.1	33.1	86.2	86.2	28.3	50.7	5.0	5.0	46.5	39.3	44.5
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	33.1	33.1	33.1	86.2	86.2	28.3	50.7	5.0	5.0	46.5	39.3	44.5
LOS by Move:	C	C	C	F	F	C	D	A	A	D	D	D
HCM2kAvgQ:	0	0	0	8	8	17	19	3	3	1	22	17

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

Evergreen/Helvetia Conceptual Design Plan
PM Peak Hour
Future Mitigated No Build Conditions (2030)

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

Intersection #5 NW Sewell Rd/NW Evergreen Rd

Average Delay (sec/veh): 2.0 | Worst Case Level Of Service: F[72.6]

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Stop Sign			Stop Sign			Uncontrolled			Uncontrolled		
Rights:	Include			Include			Include			Include		
Lanes:	0 0 1! 0 0			0 1 0 0 1			1 0 1 1 0			1 0 1 1 0		
Volume Module:												
Base Vol:	2	0	1	12	0	144	130	1381	4	2	1201	69
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	2	0	1	12	0	144	130	1381	4	2	1201	69
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
PHF Volume:	2	0	1	13	0	157	141	1501	4	2	1305	75
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
FinalVolume:	2	0	1	13	0	157	141	1501	4	2	1305	75
Critical Gap Module:												
Critical Gp:	7.5	6.5	6.9	7.5	6.5	6.9	4.1	xxxx	xxxxx	4.1	xxxx	xxxxx
FollowUpTim:	3.5	4.0	3.3	3.5	4.0	3.3	2.2	xxxx	xxxxx	2.2	xxxx	xxxxx
Capacity Module:												
Cnflict Vol:	2443	3171	753	2380	3135	690	1380	xxxx	xxxxx	1505	xxxx	xxxxx
Potent Cap.:	17	11	357	19	11	392	503	xxxx	xxxxx	451	xxxx	xxxxx
Move Cap.:	8	8	357	14	8	392	503	xxxx	xxxxx	451	xxxx	xxxxx
Total Cap:	40	41	xxxxx	84	64	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
Volume/Cap:	0.05	0.00	0.00	0.16	0.00	0.40	0.28	xxxx	xxxx	0.00	xxxx	xxxx
Level Of Service Module:												
2Way95thQ:	xxxx	xxxx	xxxxx	xxxx	xxxx	1.9	1.1	xxxx	xxxxx	0.0	xxxx	xxxxx
Control Del:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	20.1	14.9	xxxx	xxxxx	13.0	xxxx	xxxxx
LOS by Move:	*	*	*	*	*	C	B	*	*	B	*	*
Movement:	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT
Shared Cap.:	xxxx	56	xxxxx	84	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
SharedQueue:	xxxxx	0.2	xxxxx	0.5	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shrd ConDel:	xxxxx	72.6	xxxxx	55.6	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shared LOS:	*	F	*	F	*	*	*	*	*	*	*	*
ApproachDel:	72.6			22.9			xxxxxx			xxxxxx		
ApproachLOS:	F			C			*			*		

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

Evergreen/Helvetia Conceptual Design Plan
PM Peak Hour
Future Mitigated No Build Conditions (2030)

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

Intersection #6 NW SHute Rd/NW Evergreen Pkwy

Cycle (sec): 120 Critical Vol./Cap.(X): 0.947
Loss Time (sec): 16 (Y+R=4.0 sec) Average Delay (sec/veh): 50.7
Optimal Cycle: 158 Level Of Service: D

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:		Protected			Protected			Protected			Protected	
Rights:		Ovl			Ovl			Include			Include	
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:		1 0 2 0 1			1 0 2 0 2			2 0 2 1 0			2 0 3 0 1	
Volume Module:												
Base Vol:	154	985	406	74	856	232	431	1353	138	354	760	192
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	154	985	406	74	856	232	431	1353	138	354	760	192
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
PHF Volume:	167	1071	441	80	930	252	468	1471	150	385	826	209
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	167	1071	441	80	930	252	468	1471	150	385	826	209
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	167	1071	441	80	930	252	468	1471	150	385	826	209
Saturation Flow Module:												
Sat/Lane:	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Adjustment:	0.95	0.95	0.85	0.95	0.95	0.75	0.92	0.90	0.90	0.92	0.91	0.84
Lanes:	1.00	2.00	1.00	1.00	2.00	2.00	2.00	2.72	0.28	2.00	3.00	1.00
Final Sat.:	1710	3420	1530	1710	3420	2693	3317	4396	448	3317	4914	1508
Capacity Analysis Module:												
Vol/Sat:	0.10	0.31	0.29	0.05	0.27	0.09	0.14	0.33	0.33	0.12	0.17	0.14
Crit Moves:	****				****			****		****		
Green/Cycle:	0.10	0.34	0.46	0.05	0.29	0.50	0.22	0.35	0.35	0.12	0.26	0.26
Volume/Cap:	0.95	0.92	0.62	0.92	0.95	0.19	0.65	0.95	0.95	0.95	0.65	0.54
Delay/Veh:	105.6	50.0	26.1	127.3	59.1	16.3	44.9	49.2	49.2	83.5	40.8	39.7
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	105.6	50.0	26.1	127.3	59.1	16.3	44.9	49.2	49.2	83.5	40.8	39.7
LOS by Move:	F	D	C	F	E	B	D	D	D	F	D	D
HCM2kAvgQ:	10	24	13	5	22	3	9	26	26	11	11	7

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

Evergreen/Helvetia Conceptual Design Plan
PM Peak Hour
Future Mitigated No Build Conditions (2030)

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

Intersection #7 NW 229th Ave/NW Evergreen Rd

Cycle (sec): 120 Critical Vol./Cap.(X): 0.963
Loss Time (sec): 16 (Y+R=4.0 sec) Average Delay (sec/veh): 49.0
Optimal Cycle: 172 Level Of Service: D

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:		Protected			Protected			Protected			Protected	
Rights:		Ovl			Include			Include			Include	
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:		1 0 1 0 2			1 0 1 0 1			1 0 2 0 1			1 0 1 1 0	
Volume Module:												
Base Vol:	92	249	576	160	134	25	112	1414	94	234	723	127
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	92	249	576	160	134	25	112	1414	94	234	723	127
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
PHF Volume:	97	262	606	168	141	26	118	1488	99	246	761	134
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	97	262	606	168	141	26	118	1488	99	246	761	134
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	97	262	606	168	141	26	118	1488	99	246	761	134
Saturation Flow Module:												
Sat/Lane:	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Adjustment:	0.94	0.99	0.74	0.91	0.96	0.82	0.94	0.94	0.83	0.94	0.92	0.92
Lanes:	1.00	1.00	2.00	1.00	1.00	1.00	1.00	2.00	1.00	1.00	1.70	0.30
Final Sat.:	1693	1782	2657	1645	1732	1472	1693	3386	1500	1693	2816	495
Capacity Analysis Module:												
Vol/Sat:	0.06	0.15	0.23	0.10	0.08	0.02	0.07	0.44	0.07	0.15	0.27	0.27
Crit Moves:		****		****				****		****		
Green/Cycle:	0.11	0.15	0.30	0.11	0.15	0.15	0.12	0.46	0.46	0.15	0.48	0.48
Volume/Cap:	0.54	0.96	0.75	0.96	0.54	0.12	0.56	0.96	0.14	0.96	0.56	0.56
Delay/Veh:	53.9	94.8	41.6	110.4	49.1	44.1	52.8	46.6	19.1	96.5	22.4	22.4
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	53.9	94.8	41.6	110.4	49.1	44.1	52.8	46.6	19.1	96.5	22.4	22.4
LOS by Move:	D	F	D	F	D	D	D	D	B	F	C	C
HCM2kAvgQ:	4	14	13	10	5	1	5	34	2	13	12	12

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

Evergreen/Helvetia Conceptual Design Plan
PM Peak Hour
Future Mitigated No Build Conditions (2030)

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

Intersection #8 NW Cornelius Pass Rd/NW Evergreen Pkwy

Cycle (sec): 125 Critical Vol./Cap.(X): 0.964
Loss Time (sec): 16 (Y+R=4.0 sec) Average Delay (sec/veh): 51.1
Optimal Cycle: 179 Level Of Service: D

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Ovl		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	2 0 2 0 1			2 0 2 0 1			2 0 3 0 1			2 0 3 0 2		
Volume Module:												
Base Vol:	144	1291	82	437	1198	38	329	1274	149	121	502	546
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	144	1291	82	437	1198	38	329	1274	149	121	502	546
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
PHF Volume:	157	1403	89	475	1302	41	358	1385	162	132	546	593
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	157	1403	89	475	1302	41	358	1385	162	132	546	593
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	157	1403	89	475	1302	41	358	1385	162	132	546	593
Saturation Flow Module:												
Sat/Lane:	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Adjustment:	0.92	0.97	0.82	0.93	0.98	0.82	0.94	0.99	0.84	0.94	0.99	0.82
Lanes:	2.00	2.00	1.00	2.00	2.00	1.00	2.00	3.00	1.00	2.00	3.00	2.00
Final Sat.:	3321	3496	1476	3352	3528	1475	3386	5346	1515	3386	5346	2955
Capacity Analysis Module:												
Vol/Sat:	0.05	0.40	0.06	0.14	0.37	0.03	0.11	0.26	0.11	0.04	0.10	0.20
Crit Moves:		****		****				****		****		
Green/Cycle:	0.06	0.42	0.42	0.15	0.50	0.50	0.16	0.27	0.27	0.04	0.15	0.30
Volume/Cap:	0.74	0.96	0.15	0.96	0.74	0.06	0.67	0.96	0.40	0.96	0.67	0.67
Delay/Veh:	70.4	51.5	22.8	84.5	26.5	16.1	53.0	61.2	38.1	125.8	52.3	40.5
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	70.4	51.5	22.8	84.5	26.5	16.1	53.0	61.2	38.1	125.8	52.3	40.5
LOS by Move:	E	D	C	F	C	B	D	E	D	F	D	D
HCM2kAvgQ:	5	32	2	13	21	1	8	22	5	5	8	11

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

Evergreen/Helvetia Conceptual Design Plan
PM Peak Hour
Future Mitigated No Build Conditions (2030)

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

Intersection #9 NW Jackson School Rd/Hwy 26 WB Ramp

Cycle (sec): 90 Critical Vol./Cap.(X): 0.649
Loss Time (sec): 12 (Y+R=4.0 sec) Average Delay (sec/veh): 24.3
Optimal Cycle: 52 Level Of Service: C

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Split Phase			Split Phase		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1 0 1 0 0			0 0 1 0 1			0 0 0 0 0			1 1 0 0 1		
Volume Module:												
Base Vol:	142	326	0	0	380	5	0	0	0	708	1	201
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	142	326	0	0	380	5	0	0	0	708	1	201
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
PHF Volume:	154	354	0	0	413	5	0	0	0	770	1	218
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	154	354	0	0	413	5	0	0	0	770	1	218
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	154	354	0	0	413	5	0	0	0	770	1	218
Saturation Flow Module:												
Sat/Lane:	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Adjustment:	0.95	1.00	1.00	1.00	1.00	0.85	1.00	1.00	1.00	0.88	0.88	0.85
Lanes:	1.00	1.00	0.00	0.00	1.00	1.00	0.00	0.00	0.00	1.99	0.01	1.00
Final Sat.:	1710	1800	0	0	1800	1530	0	0	0	3174	4	1530
Capacity Analysis Module:												
Vol/Sat:	0.09	0.20	0.00	0.00	0.23	0.00	0.00	0.00	0.00	0.24	0.24	0.14
Crit Moves:	****				****						****	
Green/Cycle:	0.14	0.49	0.00	0.00	0.35	0.35	0.00	0.00	0.00	0.37	0.37	0.37
Volume/Cap:	0.65	0.40	0.00	0.00	0.65	0.01	0.00	0.00	0.00	0.65	0.65	0.38
Delay/Veh:	42.8	14.7	0.0	0.0	26.7	18.9	0.0	0.0	0.0	24.6	24.6	21.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	42.8	14.7	0.0	0.0	26.7	18.9	0.0	0.0	0.0	24.6	24.6	21.0
LOS by Move:	D	B	A	A	C	B	A	A	A	C	C	C
HCM2kAvgQ:	5	6	0	0	10	0	0	0	0	10	10	5

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

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----------------------------------------------------------------------------
              Evergreen/Helvetia Conceptual Design Plan
                            PM Peak Hour
             Future Mitigated No Build Conditions (2030)
----------------------------------------------------------------------------

                  Level Of Service Computation Report
         2000 HCM Operations Method (Base Volume Alternative)
****************************************************************************
Intersection #15 NW Helvetia Rd/NW Jacobson Rd
****************************************************************************
Cycle (sec):          90             Critical Vol./Cap.(X):         0.795
Loss Time (sec):      16 (Y+R=4.0 sec)  Average Delay (sec/veh):     17.6
Optimal Cycle:        82             Level Of Service:                  B
****************************************************************************
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Permitted        Permitted
Rights:          Include          Include          Include          Include
Min. Green:    0    0    0     0    0    0     0    0    0     0    0    0
Lanes:        0  0  1! 0  1   0  0  1! 0  0   0  0  1! 0  0   0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:        6  524   385     9  429     2     3     1     4   208     1     3
Growth Adj:   1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:     6  524   385     9  429     2     3     1     4   208     1     3
User Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:      0.92 0.92  0.92  0.92 0.92  0.92  0.92 0.92  0.92  0.92 0.92  0.92
PHF Volume:      7  570   418    10  466     2     3     1     4   226     1     3
Reduct Vol:      0    0     0     0    0     0     0     0     0     0     0     0
Reduced Vol:     7  570   418    10  466     2     3     1     4   226     1     3
PCE Adj:      1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:      1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:     7  570   418    10  466     2     3     1     4   226     1     3
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:     1800 1800  1800  1800 1800  1800  1800 1800  1800  1800 1800  1800
Adjustment:   0.93 0.93  0.89  0.99 0.99  0.99  0.85 0.85  0.85  0.71 0.71  0.71
Lanes:        0.01 0.72  1.27  0.02 0.97  0.01  0.37 0.13  0.50  0.98 0.01  0.01
Final Sat.:     14 1204  2050    36 1734     8   575  192   767  1253     6    18
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:      0.47 0.47  0.20  0.27 0.27  0.27  0.01 0.01  0.01  0.18 0.18  0.18
Crit Moves:        ****                                               ****
Green/Cycle:  0.60 0.60  0.60  0.60 0.60  0.60  0.23 0.23  0.23  0.23 0.23  0.23
Volume/Cap:   0.79 0.79  0.34  0.45 0.45  0.45  0.02 0.02  0.02  0.79 0.79  0.79
Delay/Veh:    17.6 17.6   9.3  10.4 10.4  10.4  27.1 27.1  27.1  46.9 46.9  46.9
User DelAdj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:   17.6 17.6   9.3  10.4 10.4  10.4  27.1 27.1  27.1  46.9 46.9  46.9
LOS by Move:     B    B     A     B    B     B     C    C     C     D    D     D
HCM2kAvgQ:      19   19     5     7    7     7     0    0     0     8    8     8
****************************************************************************
Note: Queue reported is the number of cars per lane.
****************************************************************************
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----------------------------------------------------------------------------
              Evergreen/Helvetia Conceptual Design Plan
                            PM Peak Hour
             Future Mitigated No Build Conditions (2030)
----------------------------------------------------------------------------

                  Level Of Service Computation Report
         2000 HCM Operations Method (Base Volume Alternative)
****************************************************************************
Intersection #17 NW Shute Rd/Hwy 26 EB Ramp
****************************************************************************
Cycle (sec):         120             Critical Vol./Cap.(X):         0.647
Loss Time (sec):      12 (Y+R=4.0 sec)  Average Delay (sec/veh):     19.6
Optimal Cycle:        55             Level Of Service:                  B
****************************************************************************
Approach:      North Bound      South Bound      East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected        Protected        Protected
Rights:           Ignore          Include            Ovl            Include
Min. Green:    0    0    0     0    0    0     0    0    0     0    0    0
Lanes:        0  0  2  0  1   1  0  2  0  0   0  1  0  0  1   0  0  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:        0 1131   886   129 1005     0    42     1   191     0     0     0
Growth Adj:   1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:     0 1131   886   129 1005     0    42     1   191     0     0     0
User Adj:     1.00 1.00  0.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:      0.93 0.93  0.00  0.93 0.93  0.93  0.93 0.93  0.93  0.93 0.93  0.93
PHF Volume:      0 1216     0   139 1081     0    45     1   205     0     0     0
Reduct Vol:      0    0     0     0    0     0     0     0     0     0     0     0
Reduced Vol:     0 1216     0   139 1081     0    45     1   205     0     0     0
PCE Adj:      1.00 1.00  0.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:      1.00 1.00  0.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:     0 1216     0   139 1081     0    45     1   205     0     0     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:     1800 1800  1800  1800 1800  1800  1800 1800  1800  1800 1800  1800
Adjustment:   1.00 0.94  1.00  0.92 0.92  1.00  0.94 0.94  0.82  1.00 1.00  1.00
Lanes:        0.00 2.00  1.00  1.00 2.00  0.00  0.98 0.02  1.00  0.00 0.00  0.00
Final Sat.:      0 3386  1800  1660 3321     0  1646   39  1472     0     0     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:      0.00 0.36  0.00  0.08 0.33  0.00  0.03 0.03  0.14  0.00 0.00  0.00
Crit Moves:        ****        ****                         ****
Green/Cycle:  0.00 0.56  0.00  0.13 0.68  0.00  0.22 0.22  0.22  0.00 0.00  0.00
Volume/Cap:   0.00 0.65  0.00  0.65 0.48  0.00  0.13 0.13  0.65  0.00 0.00  0.00
Delay/Veh:     0.0 19.3   0.0  56.4  9.0   0.0  38.1 38.1  47.5   0.0  0.0   0.0
User DelAdj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:    0.0 19.3   0.0  56.4  9.0   0.0  38.1 38.1  47.5   0.0  0.0   0.0
LOS by Move:     A    B     A     E    A     A     D    D     D     A    A     A
HCM2kAvgQ:       0   17     0     6   10     0     1    1     8     0    0     0
****************************************************************************
Note: Queue reported is the number of cars per lane.
****************************************************************************
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-------------------------------------------------------------------------------
               Evergreen/Helvetia Conceptual Design Plan
                              PM Peak Hour
               Future Mitigated No Build Conditions (2030)
-------------------------------------------------------------------------------

                  Level Of Service Computation Report
          2000 HCM Operations Method (Base Volume Alternative)
*******************************************************************************
Intersection #18 NW Shute/NW Huffman St
*******************************************************************************
Cycle (sec):         120              Critical Vol./Cap.(X):         0.751
Loss Time (sec):      12 (Y+R=4.0 sec) Average Delay (sec/veh):        9.3
Optimal Cycle:        70              Level Of Service:                 A
*******************************************************************************
Approach:     North Bound      South Bound       East Bound       West Bound
Movement:    L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected       Split Phase      Split Phase
Rights:           Include          Include          Include          Include
Min. Green:     0    0     0    0    0     0    0    0     0    0    0     0
Lanes:       0  0  1  1  0   1  0  2  0  0   0  0  0  0  0   1  0  0  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       0 1835    40   56 1009     0    0    0     0   67    0    27
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:    0 1835    40   56 1009     0    0    0     0   67    0    27
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     0.92 0.92  0.92 0.92 0.92  0.92 0.92 0.92  0.92 0.92 0.92  0.92
PHF Volume:     0 1995    43   61 1097     0    0    0     0   73    0    29
Reduct Vol:     0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:    0 1995    43   61 1097     0    0    0     0   73    0    29
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
FinalVolume:    0 1995    43   61 1097     0    0    0     0   73    0    29
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1800 1800  1800 1800 1800  1800 1800 1800  1800 1800 1800  1800
Adjustment:  1.00 0.95  0.95 0.95 0.95  1.00 1.00 1.00  1.00 0.95 1.00  0.85
Lanes:       0.00 1.96  0.04 1.00 2.00  0.00 0.00 0.00  0.00 1.00 0.00  1.00
Final Sat.:     0 3337    73 1710 3420     0    0    0     0 1710    0  1530
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.60  0.60 0.04 0.32  0.00 0.00 0.00  0.00 0.04 0.00  0.02
Crit Moves:       ****       ****                            ****
Green/Cycle: 0.00 0.80  0.80 0.05 0.84  0.00 0.00 0.00  0.00 0.06 0.00  0.06
Volume/Cap:  0.00 0.75  0.75 0.75 0.38  0.00 0.00 0.00  0.00 0.75 0.00  0.34
Delay/Veh:    0.0  7.4   7.4 88.3  2.3   0.0  0.0  0.0   0.0 83.2  0.0  56.7
User DelAdj: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh:   0.0  7.4   7.4 88.3  2.3   0.0  0.0  0.0   0.0 83.2  0.0  56.7
LOS by Move:    A    A     A    F    A     A    A    A     A    F    A     E
HCM2kAvgQ:      0   21    21    4    5     0    0    0     0    4    0     1
*******************************************************************************
Note: Queue reported is the number of cars per lane.
*******************************************************************************
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-------------------------------------------------------------------------------
               Evergreen/Helvetia Conceptual Design Plan
                              PM Peak Hour
               Future Mitigated No Build Conditions (2030)
-------------------------------------------------------------------------------

                  Level Of Service Computation Report
          2000 HCM Operations Method (Base Volume Alternative)
*******************************************************************************
Intersection #20 NE Brookwood Pkwy/NE Cornell Rd
*******************************************************************************
Cycle (sec):         120              Critical Vol./Cap.(X):         0.969
Loss Time (sec):      16 (Y+R=4.0 sec) Average Delay (sec/veh):       51.7
Optimal Cycle:       177              Level Of Service:                 D
*******************************************************************************
Approach:     North Bound      South Bound       East Bound       West Bound
Movement:    L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected        Protected        Protected
Rights:           Include          Include          Include          Include
Min. Green:     0    0     0    0    0     0    0    0     0    0    0     0
Lanes:       1  0  1  1  0   1  0  2  0  1   2  0  1  1  0   2  0  2  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      29  398   185  150  965   294  260 1098   100  297 1533   212
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:   29  398   185  150  965   294  260 1098   100  297 1533   212
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     0.95 0.95  0.95 0.95 0.95  0.95 0.95 0.95  0.95 0.95 0.95  0.95
PHF Volume:    31  419   195  158 1016   309  274 1156   105  313 1614   223
Reduct Vol:     0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:   31  419   195  158 1016   309  274 1156   105  313 1614   223
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
FinalVolume:   31  419   195  158 1016   309  274 1156   105  313 1614   223
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1800 1800  1800 1800 1800  1800 1800 1800  1800 1800 1800  1800
Adjustment:  0.93 0.93  0.93 0.93 0.98  0.83 0.94 0.98  0.98 0.94 0.99  0.84
Lanes:       1.00 1.37  0.63 1.00 2.00  1.00 2.00 1.83  0.17 2.00 2.00  1.00
Final Sat.:  1676 2293  1066 1676 3528  1499 3386 3227   294 3386 3564  1510
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.02 0.18  0.18 0.09 0.29  0.21 0.08 0.36  0.36 0.09 0.45  0.15
Crit Moves:  ****                 ****       ****                 ****
Green/Cycle: 0.02 0.21  0.21 0.11 0.30  0.30 0.08 0.44  0.44 0.11 0.47  0.47
Volume/Cap:  0.97 0.88  0.88 0.88 0.97  0.69 0.97 0.82  0.82 0.82 0.97  0.32
Delay/Veh:  205.9 58.0  58.0 87.7 62.2  42.1 99.7 33.1  33.1 65.0 46.4  20.2
User DelAdj: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh: 205.9 58.0  58.0 87.7 62.2  42.1 99.7 33.1  33.1 65.0 46.4  20.2
LOS by Move:    F    E     E    F    E     D    F    C     C    E    D     C
HCM2kAvgQ:      3   14    14    8   24    11    8   22    22    8   35     5
*******************************************************************************
Note: Queue reported is the number of cars per lane.
*******************************************************************************
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-------------------------------------------------------------------------------
                    Evergreen/Helvetia Conceptual Design Plan
                                PM Peak Hour
                   Future Mitigated No Build Conditions (2030)
-------------------------------------------------------------------------------
                       Level Of Service Computation Report
             2000 HCM Operations Method (Base Volume Alternative)
*******************************************************************************
Intersection #21 NE Brookwood Pkwy/W Baseline Rd
*******************************************************************************
Cycle (sec):          95            Critical Vol./Cap.(X):        0.848
Loss Time (sec):      16 (Y+R=4.0 sec) Average Delay (sec/veh):    43.2
Optimal Cycle:        96            Level Of Service:                 D
*******************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected        Protected        Protected
Rights:           Include          Include          Include          Include
Min. Green:    0    0     0    0    0     0    0    0     0    0    0     0
Lanes:       1  0  0  1  0    1  0  2  0  1    1  0  2  0  1    2  0  1  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      196  342    80    81  608    92   115  677   160   579  488    83
Growth Adj:   1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   196  342    80    81  608    92   115  677   160   579  488    83
User Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:      0.96 0.96  0.96  0.96 0.96  0.96  0.96 0.96  0.96  0.96 0.96  0.96
PHF Volume:    204  356    83    84  633    96   120  705   167   603  508    86
Reduct Vol:      0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:   204  356    83    84  633    96   120  705   167   603  508    86
PCE Adj:      1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:      1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:   204  356    83    84  633    96   120  705   167   603  508    86
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:     1800 1800  1800  1800 1800  1800  1800 1800  1800  1800 1800  1800
Adjustment:   0.93 0.95  0.95  0.94 0.94  0.84  0.93 0.93  0.83  0.90 0.98  0.83
Lanes:        1.00 0.81  0.19  1.00 2.00  1.00  1.00 2.00  1.00  2.00 1.00  1.00
Final Sat.:   1676 1389   325  1693 3386  1515  1676 3352  1488  3251 1764  1495
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:      0.12 0.26  0.26  0.05 0.19  0.06  0.07 0.21  0.11  0.19 0.29  0.06
Crit Moves:   ****                  ****              ****        ****
Green/Cycle:  0.14 0.31  0.31  0.06 0.22  0.22  0.09 0.25  0.25  0.22 0.37  0.37
Volume/Cap:   0.85 0.84  0.84  0.84 0.85  0.29  0.77 0.85  0.45  0.85 0.77  0.15
Delay/Veh:    63.1 42.4  42.4  87.9 44.4  31.3  62.7 42.1  31.1  44.9 31.6  19.9
User DelAdj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:   63.1 42.4  42.4  87.9 44.4  31.3  62.7 42.1  31.1  44.9 31.6  19.9
LOS by Move:     E    D     D     F    D     C     E    D     C     D    C     B
HCM2kAvgQ:       9   15    15     5   12     3     5   13     5    12   15     2
*******************************************************************************
Note: Queue reported is the number of cars per lane.
*******************************************************************************
```



```
-------------------------------------------------------------------------------
                    Evergreen/Helvetia Conceptual Design Plan
                                PM Peak Hour
                   Future Mitigated No Build Conditions (2030)
-------------------------------------------------------------------------------
                       Level Of Service Computation Report
             2000 HCM Operations Method (Base Volume Alternative)
*******************************************************************************
Intersection #22 NW Jacobson Rd/NW Century Blvd
*******************************************************************************
Cycle (sec):          90            Critical Vol./Cap.(X):        0.839
Loss Time (sec):      16 (Y+R=4.0 sec) Average Delay (sec/veh):    42.5
Optimal Cycle:        92            Level Of Service:                 D
*******************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected       Split Phase      Split Phase
Rights:           Include          Include          Include          Include
Min. Green:    0    0     0    0    0     0    0    0     0    0    0     0
Lanes:       1  0  1  0  1    1  0  0  1  0    0  1  0  0  1    0  1  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      264  255   335     0  132     0    15  394   105   257   53     0
Growth Adj:   1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   264  255   335     0  132     0    15  394   105   257   53     0
User Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:      0.92 0.92  0.92  0.92 0.92  0.92  0.92 0.92  0.92  0.92 0.92  0.92
PHF Volume:    287  277   364     0  143     0    16  428   114   279   58     0
Reduct Vol:      0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:   287  277   364     0  143     0    16  428   114   279   58     0
PCE Adj:      1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:      1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:   287  277   364     0  143     0    16  428   114   279   58     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:     1800 1800  1800  1800 1800  1800  1800 1800  1800  1800 1800  1800
Adjustment:   0.95 1.00  0.85  1.00 1.00  1.00  1.00 1.00  0.85  0.96 0.96  1.00
Lanes:        1.00 1.00  1.00  1.00 1.00  0.00  0.04 0.96  1.00  0.83 0.17  0.00
Final Sat.:   1710 1800  1530  1800 1800     0    66 1731  1530  1433  295     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:      0.17 0.15  0.24  0.00 0.08  0.00  0.25 0.25  0.07  0.19 0.19  0.00
Crit Moves:   ****                  ****              ****             ****
Green/Cycle:  0.20 0.29  0.29  0.00 0.09  0.00  0.29 0.29  0.29  0.23 0.23  0.00
Volume/Cap:   0.84 0.52  0.81  0.00 0.84  0.00  0.84 0.84  0.25  0.84 0.84  0.00
Delay/Veh:    51.2 27.4  39.7   0.0 69.1   0.0  41.1 41.1  24.5  47.4 47.4   0.0
User DelAdj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:   51.2 27.4  39.7   0.0 69.1   0.0  41.1 41.1  24.5  47.4 47.4   0.0
LOS by Move:     D    C     D     A    E     A     D    D     C     D    D     A
HCM2kAvgQ:      10    7    12     0    6     0    14   14     3    12   12     0
*******************************************************************************
Note: Queue reported is the number of cars per lane.
*******************************************************************************
```

```
--------------------------------------------------------------------------------
                   Evergreen/Helvetia Conceptual Design Plan
                                 PM Peak Hour
                  Future Mitigated No Build Conditions (2030)
--------------------------------------------------------------------------------
                      Level Of Service Computation Report
             2000 HCM Operations Method (Base Volume Alternative)
********************************************************************************
Intersection #23 NW Cornelius Pass Rd/NW Jacobson Rd
********************************************************************************
Cycle (sec):         120                Critical Vol./Cap.(X):        0.938
Loss Time (sec):      16 (Y+R=4.0 sec)  Average Delay (sec/veh):       41.6
Optimal Cycle:       152                Level Of Service:                 D
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected        Protected        Protected
Rights:           Include          Include          Include          Include
Min. Green:     0    0     0     0    0     0     0    0     0     0    0     0
Lanes:        1  0  1  1  0    1  0  1  1  0    2  0  0  1  0    1  0  0  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      99 1417   106    17  637    90   665  233   232    15   20     8
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   99 1417   106    17  637    90   665  233   232    15   20     8
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.92 0.92  0.92  0.92 0.92  0.92  0.92 0.92  0.92  0.92 0.92  0.92
PHF Volume:   108 1540   115    18  692    98   723  253   252    16   22     9
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:  108 1540   115    18  692    98   723  253   252    16   22     9
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:  108 1540   115    18  692    98   723  253   252    16   22     9
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1800 1800  1800  1800 1800  1800  1800 1800  1800  1800 1800  1800
Adjustment:  0.95 0.94  0.94  0.95 0.93  0.93  0.92 0.93  0.92  0.95 0.96  0.96
Lanes:       1.00 1.86  0.14  1.00 1.75  0.25  2.00 0.50  0.50  1.00 0.71  0.29
Final Sat.:  1710 3150   236  1710 2938   415  3317  834   830  1710 1230   492
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.06 0.49  0.49  0.01 0.24  0.24  0.22 0.30  0.30  0.01 0.02  0.02
Crit Moves:       ****        ****                  ****        ****
Green/Cycle: 0.11 0.52  0.52  0.01 0.42  0.42  0.31 0.32  0.32  0.01 0.03  0.03
Volume/Cap:  0.56 0.94  0.94  0.94 0.56  0.56  0.71 0.94  0.94  0.94 0.71  0.71
Delay/Veh:   54.2 37.1  37.1 232.3 26.9  26.9  38.9 63.8  63.8 244.4 99.7  99.7
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:  54.2 37.1  37.1 232.3 26.9  26.9  38.9 63.8  63.8 244.4 99.7  99.7
LOS by Move:    D    D     D     F    C     C     D    E     E     F    F     F
HCM2kAvgQ:      5   35    35     2   12    12    13   23    22     2    2     2
********************************************************************************
Note: Queue reported is the number of cars per lane.
********************************************************************************
```

Movement Summary

2030 No Build - Evergreen/Helvetia

NW Jackson School Rd/NW Meek Rd

Roundabout

Vehicle Movements

Mov No	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (ft)	Prop. Queued	Eff. Stop Rate	Aver Speed (mph)
South Approach										
32	T	1007	2.0	0.673	10.2	LOS B	157	0.34	0.62	31.5
33	R	5	16.7	0.667	0.6	LOS A	157	0.34	0.12	14.0
Approach		**1012**	**2.1**	**0.673**	**10.2**	**LOS B**	**157**	**0.34**	**0.62**	**31.4**
East Approach										
22	L	28	2.2	0.267	5.9	LOS A	54	0.81	0.76	12.1
22	R	158	2.2	0.267	5.9	LOS A	54	0.81	0.76	12.1
Approach		**186**	**2.2**	**0.267**	**5.9**	**LOS A**	**54**	**0.81**	**0.76**	**12.1**
North Approach										
42	L	100	2.1	0.477	0.1	LOS A	105	0.15	0.02	14.6
42	T	677	2.1	0.477	0.1	LOS A	105	0.15	0.02	14.6
Approach		**778**	**2.1**	**0.477**	**0.1**	**LOS A**	**105**	**0.15**	**0.02**	**14.6**
All Vehicles		**1976**	**2.1**	**0.673**	**5.8**	**LOS A**	**157**	**0.31**	**0.40**	**24.7**

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Movement Summary

2030 No Build Evergreen/Helvetia

Shute 26 WB Ramp

Roundabout

Vehicle Movements

Mov No	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (ft)	Prop. Queued	Eff. Stop Rate	Aver Speed (mph)
South Approach										
32	L	299	2.0	0.665	0.0	LOS A	171	0.05	0.00	14.9
32	T	867	2.0	0.665	0.0	LOS A	171	0.05	0.00	14.9
33	R	1	50.0	0.667	0.0	LOS A	171	0.05	0.00	14.9
Approach		**1168**	**2.1**	**0.665**	**0.0**	**LOS A**	**171**	**0.05**	**0.00**	**14.9**
East Approach										
22	L	1	4.9	0.127	8.3	LOS A	25	0.79	0.70	11.0
22	T	1	4.9	0.127	8.3	LOS A	25	0.79	0.70	11.0
22	R	76	4.9	0.127	8.3	LOS A	25	0.79	0.70	11.0
Approach		**81**	**4.9**	**0.127**	**8.3**	**LOS A**	**25**	**0.79**	**0.70**	**11.0**
North Approach										
42	L	1	2.1	0.412	1.2	LOS A	64	0.41	0.25	14.0
42	T	451	2.1	0.412	1.2	LOS A	64	0.41	0.25	14.0
42	R	63	2.1	0.412	1.2	LOS A	64	0.41	0.25	14.0
Approach		**516**	**2.1**	**0.412**	**1.2**	**LOS A**	**64**	**0.41**	**0.25**	**14.0**
West Approach										
12	L	1	50.0	0.009	2.1	LOS A	1	0.45	0.29	13.9
12	T	1	50.0	0.009	2.1	LOS A	1	0.45	0.29	13.9
12	R	1	50.0	0.009	2.1	LOS A	1	0.45	0.29	13.9
Approach		**6**	**50.0**	**0.009**	**2.1**	**LOS A**	**1**	**0.45**	**0.29**	**13.9**
All Vehicles		**1771**	**2.4**	**0.667**	**0.7**	**LOS A**	**171**	**0.19**	**0.11**	**14.4**

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Evergreen/Helvetia Conceptual Design Plan
PM Peak Hour
2030 Concept Plan - includes No Build Mitigations

Scenario Report

Scenario:	Existing PM Peak
Command:	Default Command
Volume:	Default Volume
Geometry:	Default Geometry
Impact Fee:	Default Impact Fee
Trip Generation:	Default Trip Generation
Trip Distribution:	Default Trip Distribution
Paths:	Default Path
Routes:	Default Route
Configuration:	Default Configuration

Evergreen/Helvetia Conceptual Design Plan
PM Peak Hour
2030 Concept Plan - includes No Build Mitigations

Impact Analysis Report
Level Of Service

Intersection	Base LOS	Base Del/ Veh	Base V/C	Future LOS	Future Del/ Veh	Future V/C	Change in
# 1 NW Glencoe Rd/NW Evergreen Rd	C	22.8	0.743	C	22.8	0.743	+ 0.000 D/V
# 2 NE Jackson School Rd/NW Evergr	B	17.4	0.733	B	17.4	0.733	+ 0.000 D/V
# 3 NW Jackson School Rd/NW Evergr	D	37.5	0.949	D	37.5	0.949	+ 0.000 D/V
# 5 NW Sewell Rd/NW Evergreen Rd	F	OVRFL	0.000	F	OVRFL	0.000	+ 0.000 D/V
# 6 NW SHute Rd/NW Evergreen Pkwy	E	55.7	0.994	E	55.7	0.994	+ 0.000 D/V
# 7 NW 229th Ave/NW Evergreen Rd	E	67.4	1.071	E	67.4	1.071	+ 0.000 D/V
# 8 NW Cornelius Pass Rd/NW Evergr	E	62.6	1.040	E	62.6	1.040	+ 0.000 D/V
# 9 NW Jackson School Rd/Hwy 26 WB	C	23.1	0.618	C	23.1	0.618	+ 0.000 D/V
# 15 NW Helvetia Rd/NW Jacobson Rd	B	19.2	0.840	B	19.2	0.840	+ 0.000 D/V
# 17 NW Shute Rd/Hwy 26 EB Ramp	C	23.4	0.773	C	23.4	0.773	+ 0.000 D/V
# 18 NW Shute/NW Huffman St	C	34.2	0.882	C	34.2	0.882	+ 0.000 D/V
# 20 NE Brookwood Pkwy/NE Cornell R	D	52.5	0.976	D	52.5	0.976	+ 0.000 D/V
# 21 NE Brookwood Pkwy/W Baseline R	E	56.3	0.915	E	56.3	0.915	+ 0.000 D/V
# 22 NW Jacobson Rd/NW Century Blvd	F	100.5	1.163	F	100.5	1.163	+ 0.000 D/V
# 23 NW Cornelius Pass Rd/NW Jacobs	D	44.9	0.962	D	44.9	0.962	+ 0.000 D/V

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------------------------------------------------------------------------------
                 Evergreen/Helvetia Conceptual Design Plan
                              PM Peak Hour
            2030 Concept Plan - includes No Build Mitigations
------------------------------------------------------------------------------
                    Level Of Service Computation Report
          2000 HCM Operations Method (Base Volume Alternative)
******************************************************************************
Intersection #1 NW Glencoe Rd/NW Evergreen Rd
******************************************************************************
Cycle (sec):         90              Critical Vol./Cap.(X):         0.743
Loss Time (sec):     12 (Y+R=4.0 sec) Average Delay (sec/veh):       22.8
Optimal Cycle:       64              Level Of Service:                 C
******************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected       Split Phase      Split Phase
Rights:            Ovl             Include          Include          Include
Min. Green:     0    0    0    0    0    0    0    0    0    0    0    0
Lanes:        0  0  1  0  1   1  0  1  0  0   0  0  0  0  0   2  0  0  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       0  489   458   171  448     0     0    0     0   774    0   202
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    0  489   458   171  448     0     0    0     0   774    0   202
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.94 0.94  0.94  0.94 0.94  0.94  0.94 0.94  0.94  0.94 0.94  0.94
PHF Volume:     0  520   487   182  477     0     0    0     0   823    0   215
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:    0  520   487   182  477     0     0    0     0   823    0   215
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:    0  520   487   182  477     0     0    0     0   823    0   215
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1800 1800  1800  1800 1800  1800  1800 1800  1800  1800 1800  1800
Adjustment:  1.00 1.00  0.85  0.95 1.00  1.00  1.00 1.00  1.00  0.92 1.00  0.85
Lanes:       0.00 1.00  1.00  1.00 1.00  0.00  0.00 0.00  0.00  2.00 0.00  1.00
Final Sat.:     0 1800  1530  1710 1800     0     0    0     0  3317    0  1530
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.29  0.32  0.11 0.26  0.00  0.00 0.00  0.00  0.25 0.00  0.14
Crit Moves:       ****        ****                              ****
Green/Cycle: 0.00 0.39  0.72  0.14 0.53  0.00  0.00 0.00  0.00  0.33 0.00  0.33
Volume/Cap:  0.00 0.74  0.44  0.74 0.50  0.00  0.00 0.00  0.00  0.74 0.00  0.42
Delay/Veh:    0.0 27.9   5.3  48.5 13.8   0.0   0.0  0.0   0.0  29.3  0.0  23.8
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:   0.0 27.9   5.3  48.5 13.8   0.0   0.0  0.0   0.0  29.3  0.0  23.8
LOS by Move:    A    C     A     D    B     A     A    A     A     C    A     C
HCM2kAvgQ:      0   14     6     7    9     0     0    0     0    12    0     5
******************************************************************************
Note: Queue reported is the number of cars per lane.
******************************************************************************
```



```
------------------------------------------------------------------------------
                 Evergreen/Helvetia Conceptual Design Plan
                              PM Peak Hour
            2030 Concept Plan - includes No Build Mitigations
------------------------------------------------------------------------------
                    Level Of Service Computation Report
          2000 HCM Operations Method (Base Volume Alternative)
******************************************************************************
Intersection #2 NE Jackson School Rd/NW Evergreen Rd
******************************************************************************
Cycle (sec):         90              Critical Vol./Cap.(X):         0.733
Loss Time (sec):     12 (Y+R=4.0 sec) Average Delay (sec/veh):       17.4
Optimal Cycle:       62              Level Of Service:                 B
******************************************************************************
Street Name:    Jackson School - driveway
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted        Protected        Protected
Rights:            Ovl             Include          Include          Include
Min. Green:     0    0    0    0    0    0    0    0    0    0    0    0
Lanes:        0  1  0  0  1   0  0  1! 0  0   1  0  1  1  0   1  0  1  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      95    0   431     0    0     0     0  573   126   491 1135     0
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   95    0   431     0    0     0     0  573   126   491 1135     0
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.92 0.92  0.92  0.92 0.92  0.92  0.92 0.92  0.92  0.92 0.92  0.92
PHF Volume:   103    0   468     0    0     0     0  623   137   534 1234     0
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:  103    0   468     0    0     0     0  623   137   534 1234     0
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:  103    0   468     0    0     0     0  623   137   534 1234     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1800 1800  1800  1800 1800  1800  1800 1800  1800  1800 1800  1800
Adjustment:  0.71 1.00  0.84  1.00 1.00  1.00  1.00 0.90  0.90  0.93 0.93  0.95
Lanes:       1.00 0.00  1.00  0.00 1.00  0.00  1.00 1.64  0.36  1.00 2.00  0.00
Final Sat.:  1272    0  1515     0 1800     0  1800 2648   582  1676 3352     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.08 0.00  0.31  0.00 0.00  0.00  0.00 0.24  0.24  0.32 0.37  0.00
Crit Moves:  ****                                   ****        ****
Green/Cycle: 0.11 0.00  0.55  0.00 0.00  0.00  0.00 0.32  0.32  0.43 0.76  0.00
Volume/Cap:  0.73 0.00  0.57  0.00 0.00  0.00  0.00 0.73  0.73  0.73 0.49  0.00
Delay/Veh:   56.6  0.0  14.4   0.0  0.0   0.0   0.0 29.8  29.8  24.9  4.4   0.0
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:  56.6  0.0  14.4   0.0  0.0   0.0   0.0 29.8  29.8  24.9  4.4   0.0
LOS by Move:    E    A     B     A    A     A     A    C     C     C    A     A
HCM2kAvgQ:      4    0     9     0    0     0     0   11    11    14    7     0
******************************************************************************
Note: Queue reported is the number of cars per lane.
******************************************************************************
```

Evergreen/Helvetia Conceptual Design Plan
PM Peak Hour
2030 Concept Plan - includes No Build Mitigations

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

Intersection #3 NW Jackson School Rd/NW Evergreen Rd

Cycle (sec):	90	Critical Vol./Cap.(X):	0.949
Loss Time (sec):	12 (Y+R=4.0 sec)	Average Delay (sec/veh):	37.5
Optimal Cycle:	129	Level Of Service:	D

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Permitted			Permitted			Protected			Protected		
Rights:	Include			Ovl			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0 0 1! 0 0			0 1 0 0 1			1 0 1 1 0			1 0 2 0 1		
Volume Module:												
Base Vol:	2	1	2	155	2	556	462	540	3	9	1122	524
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	2	1	2	155	2	556	462	540	3	9	1122	524
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
PHF Volume:	2	1	2	168	2	604	502	587	3	10	1220	570
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	2	1	2	168	2	604	502	587	3	10	1220	570
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	2	1	2	168	2	604	502	587	3	10	1220	570
Saturation Flow Module:												
Sat/Lane:	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Adjustment:	0.86	0.86	0.86	0.68	0.69	0.82	0.93	0.93	0.93	0.94	0.94	0.82
Lanes:	0.40	0.20	0.40	0.99	0.01	1.00	1.00	1.99	0.01	1.00	2.00	1.00
Final Sat.:	620	310	620	1216	16	1472	1676	3330	18	1693	3386	1481
Capacity Analysis Module:												
Vol/Sat:	0.00	0.00	0.00	0.14	0.14	0.41	0.30	0.18	0.18	0.01	0.36	0.38
Crit Moves:					****		****					****
Green/Cycle:	0.15	0.15	0.15	0.15	0.15	0.46	0.32	0.70	0.70	0.02	0.41	0.41
Volume/Cap:	0.02	0.02	0.02	0.95	0.95	0.89	0.95	0.25	0.25	0.25	0.89	0.95
Delay/Veh:	33.0	33.0	33.0	90.4	90.4	35.9	57.0	5.0	5.0	46.6	32.4	50.6
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	33.0	33.0	33.0	90.4	90.4	35.9	57.0	5.0	5.0	46.6	32.4	50.6
LOS by Move:	C	C	C	F	F	D	E	A	A	D	C	D
HCM2kAvgQ:	0	0	0	8	8	19	19	3	3	1	20	21

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

Evergreen/Helvetia Conceptual Design Plan
PM Peak Hour
2030 Concept Plan - includes No Build Mitigations

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

Intersection #5 NW Sewell Rd/NW Evergreen Rd

Average Delay (sec/veh): 206.1 Worst Case Level Of Service: F[1040.8]

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Stop Sign			Stop Sign			Uncontrolled			Uncontrolled		
Rights:	Include			Include			Include			Include		
Lanes:	0 0 1! 0 0			1 0 0 0 1			1 0 2 0 0			0 0 1 1 0		
Volume Module:												
Base Vol:	0	0	0	454	0	244	90	1296	0	0	1197	251
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	0	0	0	454	0	244	90	1296	0	0	1197	251
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
PHF Volume:	0	0	0	493	0	265	98	1409	0	0	1301	273
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
FinalVolume:	0	0	0	493	0	265	98	1409	0	0	1301	273
Critical Gap Module:												
Critical Gp:	7.5	6.5	6.9	6.8	xxxx	6.9	4.1	xxxx	xxxxx	xxxxx	xxxx	xxxxx
FollowUpTim:	3.5	4.0	3.3	3.5	xxxx	3.3	2.2	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Capacity Module:												
Cnflict Vol:	2255	3178	704	2338	xxxx	787	1574	xxxx	xxxxx	xxxx	xxxx	xxxxx
Potent Cap.:	23	11	384	32	xxxx	339	424	xxxx	xxxxx	xxxx	xxxx	xxxxx
Move Cap.:	4	8	384	26	xxxx	339	424	xxxx	xxxxx	xxxx	xxxx	xxxxx
Total Cap:	0	46	xxxxx	114	76	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
Volume/Cap:	xxxx	0.00	0.00	4.33	xxxx	0.78	0.23	xxxx	xxxx	xxxx	xxxx	xxxx
Level Of Service Module:												
2Way95thQ:	xxxx	xxxx	xxxxx	51.1	xxxx	6.4	0.9	xxxx	xxxxx	xxxx	xxxx	xxxxx
Control Del:	xxxxx	xxxx	xxxxx	1576	xxxx	45.0	16.0	xxxx	xxxxx	xxxxx	xxxx	xxxxx
LOS by Move:	*	*	*	F	*	E	C	*	*	*	*	*
Movement:	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT
Shared Cap.:	xxxx	0	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
SharedQueue:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shrd ConDel:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shared LOS:	*	*	*	*	*	*	*	*	*	*	*	*
ApproachDel:	xxxxxx			1040.8			xxxxxx			xxxxxx		
ApproachLOS:	*			F			*			*		

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

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                 Evergreen/Helvetia Conceptual Design Plan
                               PM Peak Hour
             2030 Concept Plan - includes No Build Mitigations
--------------------------------------------------------------------------------
                    Level Of Service Computation Report
           2000 HCM Operations Method (Base Volume Alternative)
********************************************************************************
Intersection #6 NW SHute Rd/NW Evergreen Pkwy
********************************************************************************
Cycle (sec):          120             Critical Vol./Cap.(X):        0.994
Loss Time (sec):       16 (Y+R=4.0 sec)  Average Delay (sec/veh):       55.7
Optimal Cycle:        180             Level Of Service:                 E
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Protected        Protected        Protected        Protected
Rights:           Ovl              Ovl            Include          Include
Min. Green:    0    0     0     0    0     0     0    0     0     0    0     0
Lanes:        1  0  2  0  1    1  0  2  0  2    2  0  2  1  0    2  0  3  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      186  598   558    60  822   307   797 1539   269   387  797   184
Growth Adj:   1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   186  598   558    60  822   307   797 1539   269   387  797   184
User Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:      0.92 0.92  0.92  0.92 0.92  0.92  0.92 0.92  0.92  0.92 0.92  0.92
PHF Volume:    202  650   607    65  893   334   866 1673   292   421  866   200
Reduct Vol:      0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:   202  650   607    65  893   334   866 1673   292   421  866   200
PCE Adj:      1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:      1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:   202  650   607    65  893   334   866 1673   292   421  866   200
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:     1800 1800  1800  1800 1800  1800  1800 1800  1800  1800 1800  1800
Adjustment:   0.95 1.00  0.85  0.95 1.00  0.85  0.95 0.98  0.98  0.95 1.00  0.84
Lanes:        1.00 2.00  1.00  1.00 2.00  2.00  2.00 2.55  0.45  2.00 3.00  1.00
Final Sat.:   1710 3600  1530  1710 3600  3060  3420 4494   786  3420 5400  1508
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:      0.12 0.18  0.40  0.04 0.25  0.11  0.25 0.37  0.37  0.12 0.16  0.13
Crit Moves:   ****                  ****             ****        ****
Green/Cycle:  0.12 0.32  0.45  0.05 0.25  0.55  0.30 0.37  0.37  0.12 0.19  0.19
Volume/Cap:   0.99 0.56  0.89  0.85 0.99  0.20  0.83 0.99  0.99  0.99 0.83  0.69
Delay/Veh:   114.2 34.1  43.7 110.9 73.5  13.4  44.6 56.2  56.2  94.7 52.3  51.7
User DelAdj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:  114.2 34.1  43.7 110.9 73.5  13.4  44.6 56.2  56.2  94.7 52.3  51.7
LOS by Move:     F    C     D     F    E     B     D    E     E     F    D     D
HCM2kAvgQ:      12   10    24     4   22     3    17   31    31    12   13     8
********************************************************************************
Note: Queue reported is the number of cars per lane.
********************************************************************************
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--------------------------------------------------------------------------------
                 Evergreen/Helvetia Conceptual Design Plan
                               PM Peak Hour
             2030 Concept Plan - includes No Build Mitigations
--------------------------------------------------------------------------------
                    Level Of Service Computation Report
           2000 HCM Operations Method (Base Volume Alternative)
********************************************************************************
Intersection #7 NW 229th Ave/NW Evergreen Rd
********************************************************************************
Cycle (sec):          120             Critical Vol./Cap.(X):        1.071
Loss Time (sec):       16 (Y+R=4.0 sec)  Average Delay (sec/veh):       67.4
Optimal Cycle:        180             Level Of Service:                 E
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Protected        Protected        Protected        Protected
Rights:           Ovl            Include          Include          Include
Min. Green:    0    0     0     0    0     0     0    0     0     0    0     0
Lanes:        1  0  1  0  2    1  0  1  0  1    1  0  2  0  1    1  0  1  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       89  278   600   221  220   104   192 1616    94   234  735   123
Growth Adj:   1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    89  278   600   221  220   104   192 1616    94   234  735   123
User Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:      0.95 0.95  0.95  0.95 0.95  0.95  0.95 0.95  0.95  0.95 0.95  0.95
PHF Volume:     94  293   632   233  232   109   202 1701    99   246  774   129
Reduct Vol:      0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:    94  293   632   233  232   109   202 1701    99   246  774   129
PCE Adj:      1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:      1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:    94  293   632   233  232   109   202 1701    99   246  774   129
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:     1800 1800  1800  1800 1800  1800  1800 1800  1800  1800 1800  1800
Adjustment:   0.94 0.99  0.84  0.91 0.96  0.82  0.94 0.99  0.83  0.94 0.97  0.97
Lanes:        1.00 1.00  2.00  1.00 1.00  1.00  1.00 2.00  1.00  1.00 1.71  0.29
Final Sat.:   1693 1782  3019  1645 1732  1472  1693 3564  1500  1693 2989   500
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:      0.06 0.16  0.21  0.14 0.13  0.07  0.12 0.48  0.07  0.15 0.26  0.26
Crit Moves:        ****        ****                  ****        ****
Green/Cycle:  0.08 0.15  0.29  0.13 0.20  0.20  0.18 0.45  0.45  0.14 0.40  0.40
Volume/Cap:   0.66 1.07  0.72  1.07 0.66  0.37  0.65 1.07  0.15  1.07 0.65  0.65
Delay/Veh:    64.5  125  41.4 133.3 48.8  42.1  50.3 77.6  19.9 131.4 30.5  30.5
User DelAdj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:   64.5  125  41.4 133.3 48.8  42.1  50.3 77.6  19.9 131.4 30.5  30.5
LOS by Move:     E    F     D     F    D     D     D    E     B     F    C     C
HCM2kAvgQ:       5   17    12    14    9     4     8   43     2    15   14    14
********************************************************************************
Note: Queue reported is the number of cars per lane.
********************************************************************************
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Evergreen/Helvetia Conceptual Design Plan
PM Peak Hour
2030 Concept Plan - includes No Build Mitigations

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

Intersection #8 NW Cornelius Pass Rd/NW Evergreen Pkwy

Cycle (sec):	125	Critical Vol./Cap.(X):	1.040
Loss Time (sec):	16 (Y+R=4.0 sec)	Average Delay (sec/veh):	62.6
Optimal Cycle:	180	Level Of Service:	E

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Protected			Protected		
Rights:	Include			Include			Include			Ovl		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	2 0 2 0 1			2 0 2 0 1			2 0 3 0 1			2 0 3 0 2		
Volume Module:												
Base Vol:	203	1374	77	427	1227	38	336	1486	154	121	517	551
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	203	1374	77	427	1227	38	336	1486	154	121	517	551
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
PHF Volume:	221	1493	84	464	1334	41	365	1615	167	132	562	599
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	221	1493	84	464	1334	41	365	1615	167	132	562	599
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	221	1493	84	464	1334	41	365	1615	167	132	562	599
Saturation Flow Module:												
Sat/Lane:	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Adjustment:	0.92	0.97	0.82	0.93	0.98	0.82	0.94	0.99	0.84	0.94	0.99	0.82
Lanes:	2.00	2.00	1.00	2.00	2.00	1.00	2.00	3.00	1.00	2.00	3.00	2.00
Final Sat.:	3321	3496	1476	3352	3528	1475	3386	5346	1515	3386	5346	2955
Capacity Analysis Module:												
Vol/Sat:	0.07	0.43	0.06	0.14	0.38	0.03	0.11	0.30	0.11	0.04	0.11	0.20
Crit Moves:		****		****				****		****		
Green/Cycle:	0.08	0.41	0.41	0.13	0.46	0.46	0.17	0.29	0.29	0.04	0.16	0.30
Volume/Cap:	0.82	1.04	0.14	1.04	0.82	0.06	0.65	1.04	0.38	1.04	0.65	0.69
Delay/Veh:	73.9	71.6	23.1	107.5	32.3	18.6	51.4	78.2	35.9	151.2	50.8	41.3
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	73.9	71.6	23.1	107.5	32.3	18.6	51.4	78.2	35.9	151.2	50.8	41.3
LOS by Move:	E	E	C	F	C	B	D	E	D	F	D	D
HCM2kAvgQ:	6	38	2	14	24	1	8	28	5	5	8	11

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

Evergreen/Helvetia Conceptual Design Plan
PM Peak Hour
2030 Concept Plan - includes No Build Mitigations

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

Intersection #9 NW Jackson School Rd/Hwy 26 WB Ramp

Cycle (sec):	90	Critical Vol./Cap.(X):	0.618
Loss Time (sec):	12 (Y+R=4.0 sec)	Average Delay (sec/veh):	23.1
Optimal Cycle:	49	Level Of Service:	C

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Split Phase			Split Phase		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1 0 1 0 0			0 0 1 0 1			0 0 0 0 0			1 1 0 0 1		
Volume Module:												
Base Vol:	106	323	0	0	385	5	0	0	0	690	1	204
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	106	323	0	0	385	5	0	0	0	690	1	204
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
PHF Volume:	115	351	0	0	418	5	0	0	0	750	1	222
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	115	351	0	0	418	5	0	0	0	750	1	222
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	115	351	0	0	418	5	0	0	0	750	1	222
Saturation Flow Module:												
Sat/Lane:	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Adjustment:	0.95	1.00	1.00	1.00	1.00	0.85	1.00	1.00	1.00	0.88	0.88	0.85
Lanes:	1.00	1.00	0.00	0.00	1.00	1.00	0.00	0.00	0.00	1.99	0.01	1.00
Final Sat.:	1710	1800	0	0	1800	1530	0	0	0	3178	5	1530
Capacity Analysis Module:												
Vol/Sat:	0.07	0.20	0.00	0.00	0.23	0.00	0.00	0.00	0.00	0.24	0.24	0.14
Crit Moves:	****				****						****	
Green/Cycle:	0.11	0.48	0.00	0.00	0.38	0.38	0.00	0.00	0.00	0.38	0.38	0.38
Volume/Cap:	0.62	0.40	0.00	0.00	0.62	0.01	0.00	0.00	0.00	0.62	0.62	0.38
Delay/Veh:	44.5	15.1	0.0	0.0	24.6	17.6	0.0	0.0	0.0	23.5	23.5	20.5
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	44.5	15.1	0.0	0.0	24.6	17.6	0.0	0.0	0.0	23.5	23.5	20.5
LOS by Move:	D	B	A	A	C	B	A	A	A	C	C	C
HCM2kAvgQ:	4	6	0	0	10	0	0	0	0	9	9	5

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

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--------------------------------------------------------------------------------
                   Evergreen/Helvetia Conceptual Design Plan
                                PM Peak Hour
               2030 Concept Plan - includes No Build Mitigations
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                      Level Of Service Computation Report
            2000 HCM Operations Method (Base Volume Alternative)
********************************************************************************
Intersection #15 NW Helvetia Rd/NW Jacobson Rd
********************************************************************************
Cycle (sec):        120              Critical Vol./Cap.(X):        0.840
Loss Time (sec):     12 (Y+R=4.0 sec) Average Delay (sec/veh):      19.2
Optimal Cycle:       93              Level Of Service:                B
********************************************************************************
Approach:     North Bound      South Bound       East Bound        West Bound
Movement:   L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Permitted        Permitted       Split Phase       Split Phase
Rights:          Include          Include          Include           Include
Min. Green:    0    0     0    0    0     0    0    0     0    0    0     0
Lanes:       0  0  1! 0  0    0  0  1! 0  0    0  0  1! 0  0    0  0  1! 0  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      6  596   382    9  637     2    3    1     4  188    1     3
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:   6  596   382    9  637     2    3    1     4  188    1     3
User Adj:    1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     0.92 0.92  0.92 0.92 0.92  0.92 0.92 0.92  0.92 0.92 0.92  0.92
PHF Volume:    7  648   415   10  692     2    3    1     4  204    1     3
Reduct Vol:    0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:   7  648   415   10  692     2    3    1     4  204    1     3
PCE Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
FinalVolume:   7  648   415   10  692     2    3    1     4  204    1     3
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1800 1800  1800 1800 1800  1800 1800 1800  1800 1800 1800  1800
Adjustment:  0.95 0.95  0.95 0.98 0.98  0.98 0.92 0.92  0.92 0.95 0.95  0.95
Lanes:       0.01 0.60  0.39 0.01 0.98  0.01 0.37 0.13  0.50 0.98 0.01  0.01
Final Sat.:    10 1030   660   25 1741     5  618  206   825 1676    9    27
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.63 0.63  0.63 0.40 0.40  0.40 0.01 0.01  0.01 0.12 0.12  0.12
Crit Moves:       ****                             ****              ****
Green/Cycle: 0.75 0.75  0.75 0.75 0.75  0.75 0.01 0.01  0.01 0.15 0.15  0.15
Volume/Cap:  0.84 0.84  0.84 0.53 0.53  0.53 0.84 0.84  0.84 0.84 0.84  0.84
Delay/Veh:   15.4 15.4  15.4  6.7  6.7   6.7 247.5  248 247.5 71.6 71.6  71.6
User DelAdj: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh:  15.4 15.4  15.4  6.7  6.7   6.7 247.5  248 247.5 71.6 71.6  71.6
LOS by Move:    B    B     B    A    A     A    F    F     F    E    E     E
HCM2kAvgQ:     29   29    29   11   11    11    1    1     1   10   10    10
********************************************************************************
Note: Queue reported is the number of cars per lane.
********************************************************************************
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                   Evergreen/Helvetia Conceptual Design Plan
                                PM Peak Hour
               2030 Concept Plan - includes No Build Mitigations
--------------------------------------------------------------------------------

                      Level Of Service Computation Report
            2000 HCM Operations Method (Base Volume Alternative)
********************************************************************************
Intersection #17 NW Shute Rd/Hwy 26 EB Ramp
********************************************************************************
Cycle (sec):        120              Critical Vol./Cap.(X):        0.773
Loss Time (sec):     12 (Y+R=4.0 sec) Average Delay (sec/veh):      23.4
Optimal Cycle:       75              Level Of Service:                C
********************************************************************************
Approach:     North Bound      South Bound       East Bound        West Bound
Movement:   L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected       Split Phase       Split Phase
Rights:           Ignore          Include          Include           Include
Min. Green:    0    0     0    0    0     0    0    0     0    0    0     0
Lanes:       0  0  2  0  1    1  0  2  0  0    0  1  0  0  1    0  0  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      0 1281   817  229 1089     0   45    1   192    0    0     0
Growth Adj:  1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
Initial Bse:   0 1281   817  229 1089     0   45    1   192    0    0     0
User Adj:    1.00 1.00  0.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:     0.93 0.93  0.00 0.93 0.93  0.93 0.93 0.93  0.93 0.93 0.93  0.93
PHF Volume:    0 1377     0  246 1171     0   48    1   206    0    0     0
Reduct Vol:    0    0     0    0    0     0    0    0     0    0    0     0
Reduced Vol:   0 1377     0  246 1171     0   48    1   206    0    0     0
PCE Adj:     1.00 1.00  0.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
MLF Adj:     1.00 1.00  0.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
FinalVolume:   0 1377     0  246 1171     0   48    1   206    0    0     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1800 1800  1800 1800 1800  1800 1800 1800  1800 1800 1800  1800
Adjustment:  1.00 0.94  1.00 0.92 0.92  1.00 0.94 0.94  0.82 1.00 1.00  1.00
Lanes:       0.00 2.00  1.00 1.00 2.00  0.00 0.98 0.02  1.00 0.00 0.00  0.00
Final Sat.:     0 3386  1800 1660 3321     0 1647   37  1472    0    0     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.00 0.41  0.00 0.15 0.35  0.00 0.03 0.03  0.14 0.00 0.00  0.00
Crit Moves:       ****       ****                             ****
Green/Cycle: 0.00 0.53  0.00 0.19 0.72  0.00 0.18 0.18  0.18 0.00 0.00  0.00
Volume/Cap:  0.00 0.77  0.00 0.77 0.49  0.00 0.16 0.16  0.77 0.00 0.00  0.00
Delay/Veh:    0.0 24.8   0.0 57.1  7.5   0.0 41.7 41.7  59.8  0.0  0.0   0.0
User DelAdj: 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
AdjDel/Veh:   0.0 24.8   0.0 57.1  7.5   0.0 41.7 41.7  59.8  0.0  0.0   0.0
LOS by Move:    A    C     A    E    A     A    D    D     E    A    A     A
HCM2kAvgQ:      0   22     0   10   10     0    2    2     9    0    0     0
********************************************************************************
Note: Queue reported is the number of cars per lane.
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                 Evergreen/Helvetia Conceptual Design Plan
                               PM Peak Hour
              2030 Concept Plan - includes No Build Mitigations
--------------------------------------------------------------------------------

                    Level Of Service Computation Report
           2000 HCM Operations Method (Base Volume Alternative)
********************************************************************************
Intersection #18 NW Shute/NW Huffman St
********************************************************************************
Cycle (sec):         120              Critical Vol./Cap.(X):         0.882
Loss Time (sec):      16 (Y+R=4.0 sec) Average Delay (sec/veh):        34.2
Optimal Cycle:       120              Level Of Service:                  C
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Protected        Protected        Protected        Protected
Rights:          Include          Include           Ovl             Include
Min. Green:    0    0    0    0    0    0    0    0    0    0    0    0
Lanes:       1  0  1  1  0    1  0  1  1  0    1  0  1  0  1    1  0  0  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      76 1579    41    65 1044   133   312   20   167    47   30    22
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   76 1579    41    65 1044   133   312   20   167    47   30    22
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.92 0.92  0.92  0.92 0.92  0.92  0.92 0.92  0.92  0.92 0.92  0.92
PHF Volume:    83 1716    45    71 1135   145   339   22   182    51   33    24
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:   83 1716    45    71 1135   145   339   22   182    51   33    24
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:   83 1716    45    71 1135   145   339   22   182    51   33    24
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1800 1800  1800  1800 1800  1800  1800 1800  1800  1800 1800  1800
Adjustment:  0.95 1.00  1.00  0.95 0.98  0.98  0.95 1.00  0.85  0.95 0.94  0.94
Lanes:       1.00 1.95  0.05  1.00 1.77  0.23  1.00 1.00  1.00  1.00 0.58  0.42
Final Sat.:  1710 3495    91  1710 3139   400  1710 1800  1530  1710  973   714
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.05 0.49  0.49  0.04 0.36  0.36  0.20 0.01  0.12  0.03 0.03  0.03
Crit Moves:       ****        ****             ****                   ****
Green/Cycle: 0.07 0.56  0.56  0.05 0.53  0.53  0.22 0.18  0.26  0.08 0.04  0.04
Volume/Cap:  0.68 0.88  0.88  0.88 0.68  0.68  0.88 0.07  0.46  0.38 0.88  0.88
Delay/Veh:   68.8 28.1  28.1 119.4 21.5  21.5  65.4 40.5  38.6  54.3  130 129.6
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:  68.8 28.1  28.1 119.4 21.5  21.5  65.4 40.5  38.6  54.3  130 129.6
LOS by Move:    E    C     C     F    C     C     E    D     D     D    F     F
HCM2kAvgQ:      4   31    31     5   18    18    15    1     6     2    4     4
********************************************************************************
Note: Queue reported is the number of cars per lane.
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                 Evergreen/Helvetia Conceptual Design Plan
                               PM Peak Hour
              2030 Concept Plan - includes No Build Mitigations
--------------------------------------------------------------------------------

                    Level Of Service Computation Report
           2000 HCM Operations Method (Base Volume Alternative)
********************************************************************************
Intersection #20 NE Brookwood Pkwy/NE Cornell Rd
********************************************************************************
Cycle (sec):         120              Critical Vol./Cap.(X):         0.976
Loss Time (sec):      16 (Y+R=4.0 sec) Average Delay (sec/veh):        52.5
Optimal Cycle:       180              Level Of Service:                  D
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Protected        Protected        Protected        Protected
Rights:          Include          Include          Include          Include
Min. Green:    0    0    0    0    0    0    0    0    0    0    0    0
Lanes:       1  0  1  1  0    1  0  2  0  1    2  0  1  1  0    2  0  2  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      30  403   180   153 1009   294   236 1123   100   302 1531   209
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   30  403   180   153 1009   294   236 1123   100   302 1531   209
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.95 0.95  0.95  0.95 0.95  0.95  0.95 0.95  0.95  0.95 0.95  0.95
PHF Volume:    32  424   189   161 1062   309   248 1182   105   318 1612   220
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:   32  424   189   161 1062   309   248 1182   105   318 1612   220
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:   32  424   189   161 1062   309   248 1182   105   318 1612   220
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1800 1800  1800  1800 1800  1800  1800 1800  1800  1800 1800  1800
Adjustment:  0.93 0.93  0.93  0.93 0.98  0.83  0.94 0.98  0.98  0.94 0.99  0.84
Lanes:       1.00 1.38  0.62  1.00 2.00  1.00  2.00 1.84  0.16  2.00 2.00  1.00
Final Sat.:  1676 2326  1039  1676 3528  1499  3386 3233   288  3386 3564  1510
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.02 0.18  0.18  0.10 0.30  0.21  0.07 0.37  0.37  0.09 0.45  0.15
Crit Moves:  ****                  ****        ****                   ****
Green/Cycle: 0.02 0.21  0.21  0.11 0.31  0.31  0.08 0.43  0.43  0.11 0.46  0.46
Volume/Cap:  0.98 0.85  0.85  0.85 0.98  0.67  0.98 0.85  0.85  0.85 0.98  0.31
Delay/Veh:  206.5 54.6  54.6  80.7 62.5  39.9 104.7 35.8  35.8  69.5 48.1  20.5
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh: 206.5 54.6  54.6  80.7 62.5  39.9 104.7 35.8  35.8  69.5 48.1  20.5
LOS by Move:    F    D     D     F    E     D     F    D     D     E    D     C
HCM2kAvgQ:      3   13    13     8   25    11     8   24    24     8   35     5
********************************************************************************
Note: Queue reported is the number of cars per lane.
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------------------------------------------------------------------------------
                Evergreen/Helvetia Conceptual Design Plan
                              PM Peak Hour
             2030 Concept Plan - includes No Build Mitigations
------------------------------------------------------------------------------
                   Level Of Service Computation Report
          2000 HCM Operations Method (Base Volume Alternative)
******************************************************************************
Intersection #21 NE Brookwood Pkwy/W Baseline Rd
******************************************************************************
Cycle (sec):        120              Critical Vol./Cap.(X):        0.915
Loss Time (sec):     16 (Y+R=4.0 sec)  Average Delay (sec/veh):       56.3
Optimal Cycle:      137              Level Of Service:                 E
******************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:    L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Protected        Protected        Protected        Protected
Rights:          Include          Include          Include          Include
Min. Green:    0    0     0    0    0     0    0    0     0    0    0     0
Lanes:       1  0  0  1  0   1  0  1  1  0   1  0  1  1  0   2  0  1  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:     193  352    85    83  614   122   120  680   202   587  485    82
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:  193  352    85    83  614   122   120  680   202   587  485    82
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.96 0.96  0.96  0.96 0.96  0.96  0.96 0.96  0.96  0.96 0.96  0.96
PHF Volume:   201  367    89    86  640   127   125  708   210   611  505    85
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:  201  367    89    86  640   127   125  708   210   611  505    85
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:  201  367    89    86  640   127   125  708   210   611  505    85
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1800 1800  1800  1800 1800  1800  1800 1800  1800  1800 1800  1800
Adjustment:  0.93 0.95  0.95  0.94 0.97  0.97  0.93 0.95  0.94  0.93 0.98  0.83
Lanes:       1.00 0.81  0.19  1.00 1.67  0.33  1.00 1.54  0.46  2.00 1.00  1.00
Final Sat.:  1676 1380   333  1693 2899   576  1676 2626   780  3352 1764  1493
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.12 0.27  0.27  0.05 0.22  0.22  0.07 0.27  0.27  0.18 0.29  0.06
Crit Moves:  ****                  ****              ****       ****
Green/Cycle: 0.13 0.31  0.31  0.06 0.24  0.24  0.10 0.29  0.29  0.20 0.39  0.39
Volume/Cap:  0.91 0.85  0.85  0.85 0.91  0.91  0.73 0.91  0.91  0.91 0.73  0.15
Delay/Veh:   89.5 51.0  51.0 101.7 58.8  58.8  67.1 53.4  53.4  64.2 35.0  23.6
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:  89.5 51.0  51.0 101.7 58.8  58.8  67.1 53.4  53.4  64.2 35.0  23.6
LOS by Move:    F    D     D     F    E     E     E    D     D     E    D     C
HCM2kAvgQ:     11   18    18     5   17    17     6   20    20    15   17     2
******************************************************************************
Note: Queue reported is the number of cars per lane.
******************************************************************************
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------------------------------------------------------------------------------
                Evergreen/Helvetia Conceptual Design Plan
                              PM Peak Hour
             2030 Concept Plan - includes No Build Mitigations
------------------------------------------------------------------------------
                   Level Of Service Computation Report
          2000 HCM Operations Method (Base Volume Alternative)
******************************************************************************
Intersection #22 NW Jacobson Rd/NW Century Blvd
******************************************************************************
Cycle (sec):         90              Critical Vol./Cap.(X):        1.163
Loss Time (sec):     16 (Y+R=4.0 sec)  Average Delay (sec/veh):      100.5
Optimal Cycle:      180              Level Of Service:                 F
******************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:    L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Protected        Protected       Split Phase      Split Phase
Rights:            Ovl            Include          Include          Include
Min. Green:    0    0     0    0    0     0    0    0     0    0    0     0
Lanes:       1  0  1  0  1   1  0  0  1  0   0  0  1! 0  0   0  1  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:     334  269   368     0  138     1    51  412   245   256   78     0
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:  334  269   368     0  138     1    51  412   245   256   78     0
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.92 0.92  0.92  0.92 0.92  0.92  0.92 0.92  0.92  0.92 0.92  0.92
PHF Volume:   363  292   400     0  150     1    55  448   266   278   85     0
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:  363  292   400     0  150     1    55  448   266   278   85     0
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:  363  292   400     0  150     1    55  448   266   278   85     0
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1800 1800  1800  1800 1800  1800  1800 1800  1800  1800 1800  1800
Adjustment:  0.95 1.00  0.85  1.00 1.00  1.00  0.95 0.95  0.95  0.96 0.96  1.00
Lanes:       1.00 1.00  1.00  1.00 0.99  0.01  0.07 0.58  0.35  0.77 0.23  0.00
Final Sat.:  1710 1800  1530  1800 1785    13   123  994   591  1329  405     0
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.21 0.16  0.26  0.00 0.08  0.08  0.45 0.45  0.45  0.21 0.21  0.00
Crit Moves:  ****                  ****              ****             ****
Green/Cycle: 0.18 0.25  0.43  0.00 0.07  0.07  0.39 0.39  0.39  0.18 0.18  0.00
Volume/Cap:  1.16 0.64  0.60  0.00 1.16  1.16  1.16 1.16  1.16  1.16 1.16  0.00
Delay/Veh:  139.5 32.8  21.0   0.0  171 171.1 116.8  117 116.8 139.6  140   0.0
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh: 139.5 32.8  21.0   0.0  171 171.1 116.8  117 116.8 139.6  140   0.0
LOS by Move:    F    C     C     A    F     F     F    F     F     F    F     A
HCM2kAvgQ:     20    8     9     0   10    10    38   38    38    20   20     0
******************************************************************************
Note: Queue reported is the number of cars per lane.
******************************************************************************
```

```
--------------------------------------------------------------------------------
                   Evergreen/Helvetia Conceptual Design Plan
                                 PM Peak Hour
               2030 Concept Plan - includes No Build Mitigations
--------------------------------------------------------------------------------
                      Level Of Service Computation Report
             2000 HCM Operations Method (Base Volume Alternative)
********************************************************************************
Intersection #23 NW Cornelius Pass Rd/NW Jacobson Rd
********************************************************************************
Cycle (sec):         120               Critical Vol./Cap.(X):         0.962
Loss Time (sec):      16 (Y+R=4.0 sec)  Average Delay (sec/veh):        44.9
Optimal Cycle:       171               Level Of Service:                  D
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected        Protected        Protected
Rights:           Include          Include          Include          Include
Min. Green:     0    0     0     0    0     0     0    0     0     0    0     0
Lanes:        1  0  1  1  0    1  0  1  1  0    2  0  0  1  0    1  0  0  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:     114 1439   102    17  653    92   674  239   240    24   20     8
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:  114 1439   102    17  653    92   674  239   240    24   20     8
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.92 0.92  0.92  0.92 0.92  0.92  0.92 0.92  0.92  0.92 0.92  0.92
PHF Volume:   124 1564   111    18  710   100   733  260   261    26   22     9
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:  124 1564   111    18  710   100   733  260   261    26   22     9
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:  124 1564   111    18  710   100   733  260   261    26   22     9
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1800 1800  1800  1800 1800  1800  1800 1800  1800  1800 1800  1800
Adjustment:  0.95 0.94  0.94  0.95 0.93  0.93  0.92 0.93  0.92  0.95 0.96  0.96
Lanes:       1.00 1.87  0.13  1.00 1.75  0.25  2.00 0.50  0.50  1.00 0.71  0.29
Final Sat.:  1710 3161   224  1710 2942   415  3317  830   834  1710 1230   492
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.07 0.49  0.49  0.01 0.24  0.24  0.22 0.31  0.31  0.02 0.02  0.02
Crit Moves:       ****        ****                  ****        ****
Green/Cycle: 0.12 0.51  0.51  0.01 0.40  0.40  0.32 0.33  0.33  0.02 0.03  0.03
Volume/Cap:  0.60 0.96  0.96  0.96 0.60  0.60  0.70 0.96  0.96  0.96 0.70  0.70
Delay/Veh:   54.6 41.7  41.7 246.1 28.8  28.8  38.2 69.0  69.0 215.0 98.0  98.0
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:  54.6 41.7  41.7 246.1 28.8  28.8  38.2 69.0  69.0 215.0 98.0  98.0
LOS by Move:    D    D     D     F    C     C     D    E     E     F    F     F
HCM2kAvgQ:      5   37    37     2   13    13    13   24    24     3    2     2
********************************************************************************
Note: Queue reported is the number of cars per lane.
********************************************************************************
```

Movement Summary

2030 Base Case - Evergreen/Helvetia

NW Jackson School Rd/NW Meek Rd

Roundabout

Vehicle Movements

Mov No	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (ft)	Prop. Queued	Eff. Stop Rate	Aver Speed (mph)
South Approach										
32	T	1036	2.0	0.695	10.3	LOS B	175	0.37	0.62	31.4
33	R	5	16.7	0.667	0.6	LOS A	175	0.37	0.13	14.0
Approach		**1042**	**2.1**	**0.695**	**10.2**	**LOS B**	**175**	**0.37**	**0.62**	**31.3**
East Approach										
22	L	59	2.1	0.358	6.6	LOS A	77	0.86	0.83	11.8
22	R	178	2.1	0.358	6.6	LOS A	77	0.86	0.83	11.8
Approach		**238**	**2.1**	**0.358**	**6.6**	**LOS A**	**77**	**0.86**	**0.83**	**11.8**
North Approach										
42	L	102	2.0	0.491	0.2	LOS A	109	0.24	0.04	14.4
42	T	653	2.0	0.491	0.2	LOS A	109	0.24	0.04	14.4
Approach		**755**	**2.0**	**0.491**	**0.2**	**LOS A**	**109**	**0.24**	**0.04**	**14.4**
All Vehicles		**2035**	**2.1**	**0.695**	**6.1**	**LOS A**	**175**	**0.38**	**0.43**	**24.4**

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Movement Summary

2030 Base Case - Evergreen/Helvetia

Shute 26 WB Ramp

Roundabout

Vehicle Movements

Mov No	Turn	Dem Flow (veh/h)	%HV	Deg of Satn (v/c)	Aver Delay (sec)	Level of Service	95% Back of Queue (ft)	Prop. Queued	Eff. Stop Rate	Aver Speed (mph)
South Approach										
32	L	377	2.0	0.759	0.0	LOS A	271	0.06	0.00	14.8
32	T	954	2.0	0.759	0.0	LOS A	271	0.06	0.00	14.8
33	R	1	50.0	0.667	0.0	LOS A	271	0.06	0.00	14.8
Approach		**1334**	**2.1**	**0.759**	**0.0**	**LOS A**	**271**	**0.06**	**0.00**	**14.8**
East Approach										
22	L	1	4.3	0.141	13.3	LOS B	30	0.89	0.81	9.5
22	T	1	4.3	0.141	13.3	LOS B	30	0.89	0.81	9.5
22	R	65	4.3	0.141	13.3	LOS B	30	0.89	0.81	9.5
Approach		**69**	**4.3**	**0.141**	**13.3**	**LOS B**	**30**	**0.89**	**0.81**	**9.5**
North Approach										
42	L	1	2.1	0.596	2.4	LOS A	129	0.56	0.51	13.6
42	T	599	2.1	0.596	2.4	LOS A	129	0.56	0.51	13.6
42	R	121	2.1	0.596	2.4	LOS A	129	0.56	0.51	13.6
Approach		**721**	**2.1**	**0.596**	**2.4**	**LOS A**	**129**	**0.56**	**0.51**	**13.6**
West Approach										
12	L	1	50.0	0.010	2.9	LOS A	2	0.54	0.38	13.5
12	T	1	50.0	0.010	2.9	LOS A	2	0.54	0.38	13.5
12	R	1	50.0	0.010	2.9	LOS A	2	0.54	0.38	13.5
Approach		**6**	**50.0**	**0.010**	**2.9**	**LOS A**	**2**	**0.54**	**0.38**	**13.5**
All Vehicles		**2130**	**2.3**	**0.759**	**1.3**	**LOS A**	**271**	**0.26**	**0.20**	**14.2**

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Evergreen Conceptual Design Plan
PM Peak Hour
Future Conditions (2030) MITIGATED for Concept Plan

Scenario Report

Scenario:	Existing PM Peak
Command:	Default Command
Volume:	Default Volume
Geometry:	Default Geometry
Impact Fee:	Default Impact Fee
Trip Generation:	Default Trip Generation
Trip Distribution:	Default Trip Distribution
Paths:	Default Path
Routes:	Default Route
Configuration:	Default Configuration

Evergreen Conceptual Design Plan
PM Peak Hour
Future Conditions (2030) MITIGATED for Concept Plan

Impact Analysis Report
Level Of Service

Intersection	Base LOS	Base Del/ Veh	Base V/ C	Future LOS	Future Del/ Veh	Future V/ C	Change in
# 5 NW Sewell Rd/NW Evergreen Rd	D	38.4	0.944	D	38.4	0.944	+ 0.000 D/V
# 6 NW SHute Rd/NW Evergreen Pkwy	D	48.2	0.922	D	48.2	0.922	+ 0.000 D/V
# 7 NW 229th Ave/NW Evergreen Rd	D	52.3	0.990	D	52.3	0.990	+ 0.000 D/V
# 21 NE Brookwood Pkwy/W Baseline R	D	52.7	0.887	D	52.7	0.887	+ 0.000 D/V
# 22 NW Jacobson Rd/NW Century Blvd	D	43.2	0.905	D	43.2	0.905	+ 0.000 D/V

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-------------------------------------------------------------------------------
                   Evergreen Conceptual Design Plan
                             PM Peak Hour
          Future Conditions (2030) MITIGATED for Concept Plan
-------------------------------------------------------------------------------

                  Level Of Service Computation Report
         2000 HCM Operations Method (Base Volume Alternative)
*******************************************************************************
Intersection #5 NW Sewell Rd/NW Evergreen Rd
*******************************************************************************
Cycle (sec):         120              Critical Vol./Cap.(X):          0.944
Loss Time (sec):      16 (Y+R=4.0 sec) Average Delay (sec/veh):        38.4
Optimal Cycle:       156              Level Of Service:                   D
*******************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:    L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:      Split Phase      Split Phase       Protected        Protected
Rights:          Include          Include          Include          Include
Min. Green:    0    0    0    0    0    0    0    0    0    0    0    0
Lanes:       0  0  1! 0  0   1  0  1  0  1   1  0  2  0  0   0  0  1  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      0    0    0  454    0  244   90 1296    0    0 1197  251
Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse:   0    0    0  454    0  244   90 1296    0    0 1197  251
User Adj:   1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj:    0.92 0.92 0.92 0.92 0.92 0.92 0.92 0.92 0.92 0.92 0.92 0.92
PHF Volume:    0    0    0  493    0  265   98 1409    0    0 1301  273
Reduct Vol:    0    0    0    0    0    0    0    0    0    0    0    0
Reduced Vol:   0    0    0  493    0  265   98 1409    0    0 1301  273
PCE Adj:    1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
MLF Adj:    1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
FinalVolume:   0    0    0  493    0  265   98 1409    0    0 1301  273
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:   1800 1800 1800 1800 1800 1800 1800 1800 1800 1800 1800 1800
Adjustment: 1.00 1.00 1.00 0.95 1.00 0.85 0.95 0.95 1.00 1.00 0.93 0.93
Lanes:      0.00 1.00 0.00 1.00 1.00 1.00 1.00 2.00 0.00 0.00 1.65 0.35
Final Sat.:    0 1800    0 1710 1800 1530 1710 3420    0    0 2754  577
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:    0.00 0.00 0.00 0.29 0.00 0.17 0.06 0.41 0.00 0.00 0.47 0.47
Crit Moves:                ****           ****                     ****
Green/Cycle: 0.00 0.00 0.00 0.31 0.00 0.31 0.06 0.56 0.00 0.00 0.50 0.50
Volume/Cap: 0.00 0.00 0.00 0.94 0.00 0.57 0.94 0.73 0.00 0.00 0.94 0.94
Delay/Veh:   0.0  0.0  0.0 66.7  0.0 36.6 126.5 21.2  0.0  0.0 39.8 39.8
User DelAdj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
AdjDel/Veh:  0.0  0.0  0.0 66.7  0.0 36.6 126.5 21.2  0.0  0.0 39.8 39.8
LOS by Move:   A    A    A    E    A    D    F    C    A    A    D    D
HCM2kAvgQ:     0    0    0   22    0    9    6   21    0    0   34   34
*******************************************************************************
Note: Queue reported is the number of cars per lane.
*******************************************************************************
```



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-------------------------------------------------------------------------------
                   Evergreen Conceptual Design Plan
                             PM Peak Hour
          Future Conditions (2030) MITIGATED for Concept Plan
-------------------------------------------------------------------------------

                  Level Of Service Computation Report
         2000 HCM Operations Method (Base Volume Alternative)
*******************************************************************************
Intersection #6 NW SHute Rd/NW Evergreen Pkwy
*******************************************************************************
Cycle (sec):         120              Critical Vol./Cap.(X):          0.922
Loss Time (sec):      16 (Y+R=4.0 sec) Average Delay (sec/veh):        48.2
Optimal Cycle:       141              Level Of Service:                   D
*******************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:    L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected        Protected        Protected
Rights:            Ovl              Ovl              Ovl           Include
Min. Green:    0    0    0    0    0    0    0    0    0    0    0    0
Lanes:       1  0  2  0  1   1  0  2  0  2   2  0  3  0  1   2  0  3  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:    186  598  558   60  822  307  797 1539  269  387  797  184
Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
Initial Bse: 186  598  558   60  822  307  797 1539  269  387  797  184
User Adj:   1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
PHF Adj:    0.92 0.92 0.92 0.92 0.92 0.92 0.92 0.92 0.92 0.92 0.92 0.92
PHF Volume:  202  650  607   65  893  334  866 1673  292  421  866  200
Reduct Vol:    0    0    0    0    0    0    0    0    0    0    0    0
Reduced Vol: 202  650  607   65  893  334  866 1673  292  421  866  200
PCE Adj:    1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
MLF Adj:    1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
FinalVolume: 202  650  607   65  893  334  866 1673  292  421  866  200
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:   1800 1800 1800 1800 1800 1800 1800 1800 1800 1800 1800 1800
Adjustment: 0.95 1.00 0.85 0.95 1.00 0.85 0.95 1.00 0.84 0.95 1.00 0.84
Lanes:      1.00 2.00 1.00 1.00 2.00 2.00 2.00 3.00 1.00 2.00 3.00 1.00
Final Sat.: 1710 3600 1530 1710 3600 3060 3420 5400 1510 3420 5400 1508
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:    0.12 0.18 0.40 0.04 0.25 0.11 0.25 0.31 0.19 0.12 0.16 0.13
Crit Moves: ****                ****           ****      ****
Green/Cycle: 0.13 0.35 0.48 0.05 0.27 0.56 0.29 0.34 0.46 0.13 0.18 0.18
Volume/Cap: 0.92 0.52 0.82 0.78 0.92 0.20 0.88 0.92 0.42 0.92 0.88 0.73
Delay/Veh:  91.6 31.4 34.1 93.8 56.4 13.3 50.2 46.7 21.8 75.6 57.2 55.8
User DelAdj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
AdjDel/Veh: 91.6 31.4 34.1 93.8 56.4 13.3 50.2 46.7 21.8 75.6 57.2 55.8
LOS by Move:   F    C    C    F    E    B    D    D    C    E    E    E
HCM2kAvgQ:    11   10   21    4   20    3   18   24    7   11   13    8
*******************************************************************************
Note: Queue reported is the number of cars per lane.
*******************************************************************************
```

```
-------------------------------------------------------------------------------
                       Evergreen Conceptual Design Plan
                                 PM Peak Hour
              Future Conditions (2030) MITIGATED for Concept Plan
-------------------------------------------------------------------------------
                      Level Of Service Computation Report
             2000 HCM Operations Method (Base Volume Alternative)
*******************************************************************************
Intersection #7 NW 229th Ave/NW Evergreen Rd
*******************************************************************************
Cycle (sec):          120               Critical Vol./Cap.(X):          0.990
Loss Time (sec):       16 (Y+R=4.0 sec) Average Delay (sec/veh):         52.3
Optimal Cycle:        180               Level Of Service:                   D
*******************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected        Protected        Protected
Rights:            Ovl            Include          Include          Include
Min. Green:     0    0     0    0    0     0    0    0     0    0    0     0
Lanes:        2  0  1  0  2    2  0  1  0  1    1  0  2  0  1    1  0  1  1  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      89  278   600   221  220   104   192 1616    94   234  735   123
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:   89  278   600   221  220   104   192 1616    94   234  735   123
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.95 0.95  0.95  0.95 0.95  0.95  0.95 0.95  0.95  0.95 0.95  0.95
PHF Volume:    94  293   632   233  232   109   202 1701    99   246  774   129
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:   94  293   632   233  232   109   202 1701    99   246  774   129
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:   94  293   632   233  232   109   202 1701    99   246  774   129
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1800 1800  1800  1800 1800  1800  1800 1800  1800  1800 1800  1800
Adjustment:  0.94 0.99  0.84  0.91 0.96  0.82  0.94 0.99  0.83  0.94 0.97  0.97
Lanes:       2.00 1.00  2.00  2.00 1.00  1.00  1.00 2.00  1.00  1.00 1.71  0.29
Final Sat.:  3386 1782  3019  3290 1732  1472  1693 3564  1502  1693 2989   500
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.03 0.16  0.21  0.07 0.13  0.07  0.12 0.48  0.07  0.15 0.26  0.26
Crit Moves:       ****        ****                  ****        ****
Green/Cycle: 0.04 0.17  0.31  0.07 0.20  0.20  0.20 0.48  0.48  0.15 0.43  0.43
Volume/Cap:  0.68 0.99  0.67  0.99 0.68  0.38  0.60 0.99  0.14  0.99 0.60  0.60
Delay/Veh:   69.7 99.3  37.7 111.3 50.2  42.7  46.8 50.0  17.3 105.1 26.9  26.9
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:  69.7 99.3  37.7 111.3 50.2  42.7  46.8 50.0  17.3 105.1 26.9  26.9
LOS by Move:    E    F     D     F    D     D     D    D     B     F    C     C
HCM2kAvgQ:      3   16    11     8    9     4     8   38     2    14   13    13
*******************************************************************************
Note: Queue reported is the number of cars per lane.
*******************************************************************************
```



```
-------------------------------------------------------------------------------
                       Evergreen Conceptual Design Plan
                                 PM Peak Hour
              Future Conditions (2030) MITIGATED for Concept Plan
-------------------------------------------------------------------------------
                      Level Of Service Computation Report
             2000 HCM Operations Method (Base Volume Alternative)
*******************************************************************************
Intersection #21 NE Brookwood Pkwy/W Baseline Rd
*******************************************************************************
Cycle (sec):          120               Critical Vol./Cap.(X):          0.887
Loss Time (sec):       16 (Y+R=4.0 sec) Average Delay (sec/veh):         52.7
Optimal Cycle:        123               Level Of Service:                   D
*******************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Protected        Protected        Protected        Protected
Rights:          Include          Include          Include          Include
Min. Green:     0    0     0    0    0     0    0    0     0    0    0     0
Lanes:        1  0  0  1  0    1  0  2  0  1    1  0  1  1  0    2  0  1  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:     193  352    85    83  614   122   120  680   202   587  485    82
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:  193  352    85    83  614   122   120  680   202   587  485    82
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.96 0.96  0.96  0.96 0.96  0.96  0.96 0.96  0.96  0.96 0.96  0.96
PHF Volume:   201  367    89    86  640   127   125  708   210   611  505    85
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
Reduced Vol:  201  367    89    86  640   127   125  708   210   611  505    85
PCE Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
MLF Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
FinalVolume:  201  367    89    86  640   127   125  708   210   611  505    85
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Sat/Lane:    1800 1800  1800  1800 1800  1800  1800 1800  1800  1800 1800  1800
Adjustment:  0.93 0.95  0.95  0.94 0.99  0.84  0.93 0.95  0.94  0.93 0.98  0.83
Lanes:       1.00 0.81  0.19  1.00 2.00  1.00  1.00 1.54  0.46  2.00 1.00  1.00
Final Sat.:  1676 1380   333  1693 3564  1515  1676 2626   780  3352 1764  1494
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.12 0.27  0.27  0.05 0.18  0.08  0.07 0.27  0.27  0.18 0.29  0.06
Crit Moves:       ****        ****                  ****        ****
Green/Cycle: 0.14 0.30  0.30  0.06 0.21  0.21  0.11 0.30  0.30  0.21 0.40  0.40
Volume/Cap:  0.84 0.89  0.89  0.89 0.84  0.39  0.71 0.89  0.89  0.89 0.71  0.14
Delay/Veh:   72.2 57.1  57.1 112.6 53.3  41.2  64.4 49.3  49.3  59.7 33.1  22.7
User DelAdj: 1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
AdjDel/Veh:  72.2 57.1  57.1 112.6 53.3  41.2  64.4 49.3  49.3  59.7 33.1  22.7
LOS by Move:    E    E     E     F    D     D     E    D     D     E    C     C
HCM2kAvgQ:     10   19    19     6   14     4     6   19    19    14   16     2
*******************************************************************************
Note: Queue reported is the number of cars per lane.
*******************************************************************************
```

Evergreen Conceptual Design Plan
PM Peak Hour
Future Conditions (2030) MITIGATED for Concept Plan

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

Intersection #22 NW Jacobson Rd/NW Century Blvd

Cycle (sec):	90	Critical Vol./Cap.(X):	0.905
Loss Time (sec):	16 (Y+R=4.0 sec)	Average Delay (sec/veh):	43.2
Optimal Cycle:	111	Level Of Service:	D

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Protected			Protected			Split Phase			Split Phase		
Rights:	Ovl			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	1 0 1 0 1			1 0 0 1 0			0 1 0 1 0			0 1 0 0 0		
Volume Module:												
Base Vol:	334	269	368	0	138	1	51	412	245	256	78	0
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	334	269	368	0	138	1	51	412	245	256	78	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
PHF Volume:	363	292	400	0	150	1	55	448	266	278	85	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	363	292	400	0	150	1	55	448	266	278	85	0
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	363	292	400	0	150	1	55	448	266	278	85	0
Saturation Flow Module:												
Sat/Lane:	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Adjustment:	0.95	1.00	0.85	1.00	1.00	1.00	0.90	0.90	0.90	0.96	0.96	1.00
Lanes:	1.00	1.00	1.00	1.00	0.99	0.01	0.14	1.17	0.69	0.77	0.23	0.00
Final Sat.:	1710	1800	1530	1800	1785	13	233	1879	1117	1329	405	0
Capacity Analysis Module:												
Vol/Sat:	0.21	0.16	0.26	0.00	0.08	0.08	0.24	0.24	0.24	0.21	0.21	0.00
Crit Moves:	****				****		****				****	
Green/Cycle:	0.23	0.33	0.56	0.00	0.09	0.09	0.26	0.26	0.26	0.23	0.23	0.00
Volume/Cap:	0.90	0.50	0.47	0.00	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.00
Delay/Veh:	56.9	25.0	12.3	0.0	83.7	83.7	45.1	45.1	45.1	57.0	57.0	0.0
User DelAdj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	56.9	25.0	12.3	0.0	83.7	83.7	45.1	45.1	45.1	57.0	57.0	0.0
LOS by Move:	E	C	B	A	F	F	D	D	D	E	E	A
HCM2kAvgQ:	14	7	7	0	7	7	15	15	15	14	14	0

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

Appendix H

Draft Sanitary Sewer Trunk Concept Design

Draft Sanitary Sewer Trunk Concept Design Helvetia Road Planning Area

PREPARED FOR: Shuki Einstein

PREPARED BY: Richard Attanasio, P.E., C.F.M./CH2M HILL

Emily Callaway, E.I.T.

DATE: August 30, 2007

PROJECT NUMBER: 355284.01.A7.C0.00

Introduction

The Helvetia Road Planning Area was brought into the City of Hillsboro's urban growth boundary in 2004. The planning area was added to the urban growth boundary for the purpose of maintaining a 20-year supply of industrial land in the Portland Metro region[1].

This document is a conceptual overview of the existing sanitary services in the planning area, the challenges in sewering the area, and the proposed method of providing future sanitary service.

The Helvetia Road Planning Area (HRPA) lies within Township 1N, Range 2W (1N2W), and is approximately 243 acres in size. The property lies in Washington County, outside and adjacent to the current Clean Water Services (CWS) service area. The area will be brought into both the City's and CWS's service area.

CWS is in the process of updating their sanitary sewer master plan (SSMP). The projected flows from the Helvetia Road Planning Area (HRPA) have not been added to the CWS SSMP hydraulic model. Therefore, determination of adequate downstream capacity in the CWS system to serve the HRPA can not be verified at this time.

Existing Sanitary Sewer System

There is a pump station discharging to a 4-inch force main in the southern area of the Helvetia planning area. The pump station is located within the Helvetia Road planning area and serves a small subdivision directly north of NW Jacobson Road. The force main extends a distance of 900 feet in Jacobsen Road and connects to the Sunset trunk approximately 1,925 feet south of the planning area via a 12-inch gravity pipe.

Flow Generation

Build-out sanitary sewer flows are based on the current land use projections. These land use numbers are preliminary and subject to change. The entire HRPA was considered as a single tributary area. Land use is expected to be industrial. Sanitary flows from industrial

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[1] Evergreen and Helvetia Concept Planning Newsletter, April 2007

uses can be highly variable depending upon the actual industry. To be conservative, gross land area was used for sanitary flow projections.

An Inflow and Infiltration (I&I) rate of 1,650 gallons per net acre per day (gpad) was used for downstream analysis. An I&I rate of 4,000 gpad should be used for design on the new system, in accordance with CWS standards. Peaking factors are flow based and taken from the City of Portland's Sewer Design Manual, as was the average flow per net acre.

Table 1: Preliminary Land Use and Peak Sanitary Sewer Flows

Land Use	Gross Acreage (Ac)	Peak Flow (cfs)
Industrial	243	**6.5**

Concept Plan Sanitary Trunk Sewer Considerations

The Helvetia Road Planning Area is relatively steeply sloped. Wiable Gulch, a tributary of McKay Creek, runs north to south along the east side of Helvetia Road. Creek crossings by the sanitary system, particularly the crossing of Pubols Road across Wiable Gulch, presents some challenges.

Conceptual Collection System Plan

There is one proposed alternative for the Helvetia Road Planning Area sanitary collection system. The low point in the HRPA is in the southwest corner near the intersection of Helvetia Road and Jacobsen Road. This area is also lower than the areas south of the HRPA making gravity discharge a non-viable option. The proposed sewering plan is to use gravity lines in Pubols Road and Schaaf Road to convey flows to a gravity mainline in Helvetia Road. A new pump station will be placed near the intersection of Helvetia Road and Jacobsen Road. The existing pump station should be taken off line and connected to the new pump station by gravity.

Planning Level Concept Cost Estimates

Planning level cost estimates are given in Table 2. The cost estimate for the conceptual alternative is based on best professional judgment. Total program cost includes engineering fees equal to 30% of the construction cost. These are costs for main lines only and do not include minor collectors or laterals.

Table 2: Conceptual Construction and Program Costs (based on I&I of 1,650 gpad)

Alternative	Total Construction Cost ($)	Total Program Cost ($)
Alternative 1	2,500,000	3,300,000

Recommendations for Future Studies

As part of their master planning process CWS will determine the downstream effects of development of the HRPA. Specific site studies should be performed in the HRPA to obtain complete topographic mapping and geotechnical characterization of the site, prior to design of the collection system and pump station.

\\ASTORIA\GISDATA1\DATA\PROJ\CITYOFHILLSBORO\EVERGREEN_HELVETIA_UGB_CONCEPTS\GIS\MAPDOCUMENTS\CONCEPTS\FIGURE1_HELVETIA_CONCEPT_SANITARY_SEWER.MXD 9/12/2007 14:53:06

Figure 1
Helvetia Concept Planning Area Sanitary Sewer System Conceptual Alternative
Evergreen/Helvetia UGB Concept Plans

LEGEND

- Gravity Pipe
- Force Main
- Helvetia Site (Planning Area = 242.12 ac)
- Roads
- Tax Lots

N

0 500 1,000
Feet

Angelo planning group

CH2MHILL

Appendix I

Draft Stormwater Concept Design

Draft Stormwater Concept Design Helvetia Road Planning Area

PREPARED FOR: Shuki Einstein

PREPARED BY: Richard Attanasio, P.E., C.F.M./CH2M HILL

DATE: August 30, 2007

PROJECT NUMBER: 355284.01.A7.C0.00

Introduction

The Helvetia area is flat to gently sloping and populated primarily with hydrologic group C and D soils. These soils have relatively low rates of infiltration and high runoff potential, particularly when wet. Average annual precipitation is on the order of 40-inches per year, with the majority of precipitation falling during the winter months.

There is currently no stormwater conveyance system within the Helvetia Road Planning Area with the exception of a discharge from the Jacobson Road stormwater system to the southern drainage swale in the planning area. A 12-inch diameter storm system currently serving the south side NW Jacobson Road discharges to Wiable Gulch at Jacobson and Helvetia Road. The north side of Jacobson Road is not curbed and is served by a roadside drainage ditch. Helvetia Road, along the west side of the planning area, is served by roadside ditches that discharge in to Wiable Gulch. West Union Road along the north side of the planning area is also served by roadside ditches draining into Wiable Gulch or its tributary.

Regulatory Issues

The primary regulatory driver for stormwater management is Clean Water Services and their Design and Construction Standards. These standards regulate the conveyance, detention and water quality treatment of stormwater with the Washington County UGB. The standards were recently updated (R&O 07-20) and published June 1, 2007.

These standards require stormwater quality treatment for all impervious area created by the development, whether its new or re-developed impervious area. Stormwater treatment is required for the first 0.36-inchs of precipitation over a 4-hour period. The new standards also allow the use of Low Impact Development (LID) techniques in concert with traditional quality and quantity control methods. LID techniques can be used to provide quality treatment and reduce the requirements for quantity control. The inclusion of LID techniques in the Design and Construction Standards are new to the Clean Water Services standards and were not included in the past standards.

Quantity control, or detention, is required when there is an identified downstream deficiency. The discharger can either be required to improve the downstream conveyance system to eliminate the downstream deficiency or provide detention to prevent an increase in peak runoff rates for the 2, 10, and 25-year discharges. There is currently extensive flooding of Waible Gulch in the Evergreen area; therefore, it is reasonable to assume that quantity control will be required for the creation of new impervious area.

The standards require stormwater conveyance for the 25-year build-out flow. All public storm systems components that are located in private rights-of-way will require easements granted to Clean Water Services. This is inclusive of pipes and management facilities.

A potential additional regulatory driver for stormwater in the Evergreen Road Planning Area is the Endangered Species Act. If a federal nexus exists in the permitting of any development within the Evergreen Road Planning Area, stormwater management guidelines promulgated by the National Marine Fisheries Service (NMFS) could be required. These guidelines could potentially increase the requirements for stormwater management. NMFS guidelines specify water quality treatment for 72-percent of the 2-year, 24-hour storm, or 1.80-inches in 24 hours. Detention is to be provided for ½ of the 2-year, 24-hour event through the 50-year, 24-hour event. Providing facilities to meet these standards will require greater commitment of area a resources than those required under the Clean Water Services standards. The NMFS guidelines recognize the benefits of LID techniques; therefore, these techniques can also be incorporated into a stormwater management plan designed to meet their guidelines.

Conceptual Stormwater Design Issues

The extent of water quality and detention requirements for an individual development will depend on whether the development is federalized making it subject to NMFS consultation and their stormwater management guidelines. If the development is not federalized the stormwater management needs to meet CWS standards for conveyance, water quality and detention. If the development is federalized, the development will also need to meet all the CWS requirements in addition to the NMFS guidelines.

Water quality treatment options are contained in Chapter 4 of CWS's Design and Construction Standards. LID options are specifically addressed in §4.07 of CWS's Design and Construction Standards. Among the acceptable LID options for private systems are: pervious paving, Eco-Roofs/Roof Gardens; Infiltration Planters; Flow through Planters; Sand Filters; and Tree boxes. Acceptable LID options for public systems also include: Street Swales; Vegetated Filter Strips; and Vegetated Infiltration Basins. For any developments less than one acre, if at least 75-percent of the post development impervious area is treated with LID options no additional stormwater management may be required by CWS.

Discharge of piped or overland conveyance should go to Wiable Gulch or to the Jacobson Road storm sewer system. It is unclear what the capacity of the Jacobson Road storm sewer system is; therefore, a downstream analysis must be performed on the system to determine permissible discharge rates. Outfalls to Wiable Gulch should be designed in compliance with §5.07.7 of CWS's Design and Construction Standards. They should be above mean low water level and use energy dissipation. These outfalls may also trigger Clean Water Act permit issues.

Appendix J

Helvetia Water System Concept Planning

Helvetia Water System Concept Planning

PREPARED FOR: Shuki Einstein

PREPARED BY: David T. Mustonen PE, CWRE

DATE: September 6, 2007

Water Infrastructure Improvements

This section discusses the estimated water demands, water supply sources, private water infrastructure improvements and estimated costs for developing the needed water infrastructure for the Helvetia development.

Helvetia Water Demands

The Helvetia development area will consist of approximately 239 acres, for purposes of estimating water demands it is assumed that the site will be developed primarily with general industry and commercial industry. Empirical water demand data was used to estimate the average water demand for these types of uses. The average water demand for site is estimated to be approximately 5,500 Gallons per day (GPD)/Acre for this type of use. This results in a total water system average demand of approximately 1.31 Million Gallons per Day (MGD). The peaking factor for this use is estimated to be 1.5 considering there could be irrigation demands in the summer months. This results in a peak water demand of 1.97 MGD.

Helvetia Water Supply Source

The Helvetia development site is located adjacent to the service area of the Tualatin Valley Water District (TVWD), and water provided to the development will be provided by TVWD, which receives it source potable water from either the Joint Water Commission surface water treatment plant located in the City of Forest Grove or is purchased water from the Portland Water Bureau. The JWC provides treated surface water, although the Portland Water Bureau provides either untreated surface water or untreated groundwater depending upon the time of the year. TVWD has indicated that the additional 1 to 2 MGD of average and peak demand could be provided to the Helvetia site without the need of any additional public water infrastructure improvements. TVWD currently has a 24-inch water transmission main located along Jacobsen Road adjacent to the southern boundary of the Helvetia site. TVWD has indicated that the development could connect to this 24-inch transmission main and extend the private water infrastructure within the site to adequately supply the needed water for general industry applications.

Helvetia Water Infrastructure Improvements

The primary water system infrastructure improvements required for the Helvetia development site are illustrated in Figure 1. The improvements primarily consist of water transmission pipeline and two interconnections and 1 metering station with the TVWD 24 inch water transmission main located along Jacobson Road. Water transmission pipelines have been sized with design criteria maintain pipeline velocities less than 5 feet per second. The concept design illustrated in Figure 1 illustrates the extension of new water transmission from the Jacobsen Road 24-inch transmission main through the Helvetia site, to an additional intertie with the 18-inch TVWD transmission pipeline located in West Union Road, this will provide the site water supply system redundancy and looping characteristics for the site water supply system. There are two swale/creek crossings that are required for construction of this transmission system.

The estimated construction costs for developing the primary water infrastructure for the Helvetia development is approximately $1.13 M, a detailed breakdown of the cost estimate is presented in Table 1, this estimate is considered an Order of Magnitude estimate with an accuracy of +30%/-50%.   In addition to capital improvement costs, the development will incur System Development Charges (SDCs) from TVWD for enabling the water district to provide the water supply for the Helvetia site. The SDCs are based on the water usage for the development. Based on an average flow rate of 1.31 MGD and peak flow rate of 1.97 MGD, the total SDCs for this development are estimated to be $8.7 M. The TVWD SDC calculation worksheet is provided in Attachment A.

Figure 1

Helvetia Site Water Infrastructure Improvement

Everygreen/Helvetia UGB Concept Plans

LEGEND

- Concept Water Main
- Existing Water Main
- Helvetia Site (Planning Area = 242.12 ac)
- Roads
- Tax Lots

N

0 500 1,000

Feet

Angelo planning group

CH2MHILL

File Path: S:\data\Proj\CityofHillsboro\Evergreen_Helvetia_UGB_Concepts\GIS\MapDocuments\Existing_Utilities\Figure1_Helvetia_project_Vicinity.mxd, Date: October 10, 2007 3:43:30 PM

TABLE 1 ***Helvetia Development Water Infrastructure Improvements***
Order of Magnitude Comparative Construction Cost Estimates

Item Description	Quantity		Materials Unit	Materials Total	Labor Unit	Labor Total	Unit Price	Line Total	Costing Assumptions
General Conditions	$130,300								
General Conditions	1	LS	$38,700	$38,700	$48,200	$48,200	$86,900	$86,900	Allow 10% of Total Contract Amount
Bonds/Insurance	1	LS	7,700	7,700	9,600	9,600	17,300	17,300	Allow 2% of Total Contract Amount
Mobilization/Demobilization/Site Facilities	1	LS	11,600	11,600	14,500	14,500	26,100	26,100	Allow 3% of Total Contract Amount
Earthwork	$739,000								
Pipe Installed Thru Open Farmland--12" dia	4,000	LF	40.00	160,000	60.00	240,000	100.00	400,000	Means 06 BCCD 02510 730 2100
Pipe Installed Along County Road--12" dia	2,500	LF	50.00	125,000	60.00	150,000	110.00	275,000	Means 06 BCCD 02510 730 2100
Valved Branches in Main Line	4	EA	2,500	10,000	1,500	6,000	4,000	16,000	Allowance
Valves in Main Line	2	EA	2,000	4,000	1,000	2,000	3,000	6,000	Allowance
Swale Crossings	2	EA	5,000	10,000	5,000	10,000	10,000	20,000	Allowance
Connection and 8 inch meter to Exstg Service	2	EA	10,000	20,000	1,000	2,000	11,000	22,000	Allowance
Subtotal Estimated Construction Cost of Helvetia Water Infrastructure Improvements								$869,300	
+ Contingency @ 30%								260,700	
Total Estimated Construction Cost of Helvetia Water Infrastructure Improvements								**$1,130,000**	

The cost estimates shown have been prepared for guidance in project evaluation and implementation from the information available at the time of the estimate. The final costs of the project will depend on actual labor and material costs, competitive market conditions, final project scope, implementation schedule and other variable factors. As a result, the final project costs will vary from the estimates presented herein. Because of this, project feasibility and funding needs must be carefully reviewed prior to making specific financial decisions to help ensure proper project evaluation and adequate funding.

Attachment A

TVWD Estimated System Development Charges

TUALATIN VALLEY WATER DISTRICT

SDC WORKSHEET FOR METERS 2" AND GREATER 8/22/2007

CUSTOMER

AVG. DAY CALCULATED AT	=	1,310,000
PEAK DAY CALCULATED AT	=	1,970,000

PROJECT

ENGINEER

ERU CALCULATION

ANTICIPATED PEAK DAY USAGE	1,970,000	DIVIDED BY	844	=	2334	PEAK DAY ERU'S
ANTICIPATED AVERAGE DAILY WATER USAGE	1,310,000	DIVIDED BY	358	=	3659	STORAGE ERU'S

PEAK DAY SDC COST:

REIMBURSEMENT FEE	$593	PER PEAK DAY ERU	TIMES	2,334	=	$1,384,135	
IMPROVEMENT FEE	$2,081	PER PEAK DAY ERU	TIMES	2,334	=	$4,857,310	
PEAK DAY SDC COST	$2,674	PER PEAK DAY ERU					$6,241,445

SDC STORAGE COST:

REIMBURSEMENT FEE	$370	PER STORAGE ERU	TIMES	3,659	=	$1,353,911	
IMPROVEMENT FEE	$297	PER STORAGE ERU	TIMES	3,659	=	$1,086,788	
STORAGE COST	$667	PER STORAGE ERU					$2,440,698

SYSTEM DEVELOPMENT CHARGE **$8,682,144**

INSTALLATION ESTIMATE

ONE 8" METER INSTALLED BY TVWD IN DEVELOPER'S INSTALLED VAULT $20,000

TOTAL **$8,702,144**

Appendix K

Helvetia Area Industrial Plan
(New Comprehensive Plan Section)

Section 25. <u>Helvetia Area Industrial Plan</u>.

(I) Goal.

To expand and diversify the Hillsboro industrial economic base by establishing and implementing a *Helvetia Area Development Plan* and *Development Program* that provides for:

- Large parcels for large industrial campuses and other industrial sites that can accommodate large, vertically-integrated companies and related businesses in cutting-edge industry sectors such as high technology sector, sustainable energy/ environmental products sector, bio-technology, bio-medical and bio-pharmaceutical sector; and
- Flex building space within small- and medium-size industrial campuses and business parks to accommodate flex uses, research and development companies, incubator businesses, business suppliers, spin-off companies and other businesses that derive from, or are extensions of larger campus users and industrial developments within the Helvetia Area and Portland Region.

(II) Policies.

(A) Develop, adopt and apply ***performance-based*** Area Comprehensive Plan and Zoning Implementation Provisions and Measures to guide the development of industrial uses, properties and projects within the Area towards conformance with this Plan and corresponding City land use regulations with sufficient flexibility and authority to enable City Plan and regulatory responsiveness to changing industrial market trends and opportunities for the Area over time.

(B) Provide development opportunities within the Helvetia Area for industry uses that fall within any of the following preferred industry categories specified in the *Helvetia Area Development Program*:

- High technology sector and related companies and businesses.
- Sustainable industries sector and related businesses and companies.
- Bio-technology, bio-medical, bio-pharmaceutical sector and related businesses and companies.
- Businesses and companies that are incubators, start-ups, spin-offs and research and development firms associated with main industrial sectors.
- Industry supplies and distribution businesses.
- Limited support commercial services.

(C) Where feasible, accommodate large industrial sites (parcels 50 – 100 or more acres in size) for large-scale industrial campuses and development projects, and land assembly and reservation of such sites where large-size parcels form the prevailing land ownership pattern.

(D) Where smaller parcels form the prevailing lot ownership pattern encourage and facilitate the development of smaller, diversified industrial uses and sites (20 – 50 acres in size) - especially smaller-scaled flex-space industrial business parks - that support the main industry sectors encouraged by this Plan.

(E) Use the industry land use categories specified in the *Helvetia Area Development Program* and graphically expressed in the alternative conceptual land use design scheme for the Area shown in *Helvetia Conceptual Illustration "A"*, (shown in Figure 1,) to guide new industrial development within the Area.

(F) Provide for aesthetically attractive, well designed industrial uses and sites within every development approved for construction in the Helvetia Industrial Area.

(G) In accordance with ORS 268.390 (SB 722 ('07)), develop and apply a Helvetia Area Industrial Plan and corresponding Helvetia Special Industrial District Ordinance that substantially comply with Metro Urban Growth Boundary (UGB) Conditions of Approval and Urban Growth Management Functional Plan requirements that may apply to the Helvetia Area.

(III) Implementation Measures.

(A) Helvetia Area Development Program.

(1) The industrial use categories prescribed in Policy (II (B), above, and corresponding *Helvetia Special Industrial District (HSID)* Zoning Ordinance comprise the *Helvetia Area Development Program*. City review and approval of proposed land uses and development activities within the Helvetia Area for compliance with this Plan shall be guided by whether the proposed use or activity: (1) falls within any land use category prescribed by the *Development Program*; and, (2) generally achieves the preferred Area Conceptual Land Use Design identified in Implementation Measure (III) (B) in this Section.

(2) The *Helvetia Road Area Special Industrial District* (HSID) Ordinance adopted pursuant to Implementation Measure (III) (C) in this Section shall further define and implement the industrial land use categories prescribed by the *Helvetia Area Development Program* as follows:

Helvetia Area Development Program Industrial Use Categories	**Preferred Project Development Scale (Range in Acres)**
High Technology, Sustainable Industries and Bio-Technology, Bio-Medical, Bio-Pharmaceutical Sectors.	• Large campuses: 50-100 or more acres • Small campuses: 30-50 acres
Business incubators, start-ups, spin-offs, expansions, R&D associated with the major industry sectors	Small and medium-size industrial business parks and flex space: 10-40 acres
Industry suppliers and distribution businesses	Smaller- and medium-size bulk storage and distribution space: 10-20 acres

(B) Helvetia Area Conceptual Land Use Design (Urban Growth Diagram).

The conceptual land use design scheme for the Area is shown in the *Helvetia Conceptual Illustration "A* (shown in Figure 1). The design is adopted by reference as a part of this Plan as the Area-wide land use design alternative. The land use design is implemented by the corresponding City *Helvetia Area Special Industrial District* (HSID) Ordinance. The land use designs shall be actively used to generally guide public and private land uses and development in the Area toward implementation of the *Development Program*.

Upon adoption of this Plan Ordinance, Concept "A" shall be the preferred Area land use design scheme to be implemented through applications of the HSID Ordinance to proposed land uses and developments.

(C) Helvetia Area Special Industrial District (HSID)

(1) A *Helvetia Special Industrial District* (HSID) Ordinance shall be prepared, adopted and applied by the City to generally guide proposed Helvetia Area developments toward achievement of the *Development Program* by assuring general development consistency with Concept "A". As applied to individual properties in the Area, should a land use policy conflict arise between what is specified for a property by the *Development Program* and what is shown for that property by Concept "A", the *Development Program* provision shall prevail and control. Application of HSID Ordinance provisions to Area properties may occur only upon their annexation to the City.

(2) Consistent with ORS 268.390 (SB 722 ('07)), HSID Ordinance provisions shall assure that public and private land use and development actions within the Area attain substantial compliance with Regional UGB Conditions of Approval, including conditions requiring compliance with Title 4 development requirements and Regionally Significant Industrial Area (RSIA) designations.

(3) Site design and architectural measures that provide for compatibility between and among industrial land uses developed within the Area and nearby agricultural uses and operations shall be considered and required through the City Development Review/Approval process (Section 133 of the Hillsboro Zoning Ordinance), unless demonstrated to be physically or financially impracticable. Possible compatibility measures include, but are not limited to: building orientation and setbacks; landscaping; land buffers; and access easements for farming vehicles and machinery.

(D) Area Annexation Plan.

Prior to their annexation to the City and the concurrent application of the HSID Ordinance to properties in the Helvetia Area, land uses within the Area shall continue to be governed by the existing Washington County zoning of the properties. Annexation of Area properties to the City shall take place in accordance with annexation policies and practices set forth in the City Municipal Code and in the Boundary Change Code of the Portland Metropolitan Service District ("Metro").

(E) Area Natural Resources Management Plan.

In accordance with the City's Goal 5 provisions of Section 6, Natural Resources, Open Space, Scenic and Historical Sites, of the Hillsboro Comprehensive Plan, significant wetland and riparian/upland wildlife habitat resources in the Helvetia Area shall be accorded the appropriate protection level prescribed by Section 131A, Significant Natural Resources Overlay District, of the Hillsboro Zoning Ordinance upon annexation to the City of the land on which they exist.

(F) Area Public Infrastructure (Water, Sewer, Stormwater Systems) Management Plan.

The recommended water system, sanitary sewer system and storm water disposal system facilities shown on the Helvetia Area Industrial Plan *Public Facilities and Services Maps* in Figures 2 through 3, shall be incorporated into the following Hillsboro Public Facilities (2001) Maps (as amended) as appropriate:

- *Hillsboro Public Facility Plan Water System Improvement Map* (June, 2001) as amended (for proposed Helvetia Area water system and lines).
- *Hillsboro Public Facility Plan Surface Water Management System Improvement Map* (June, 2001) as amended (for proposed Helvetia Area storm water facilities).
- *Hillsboro Public Facility Plan Sanitary Sewers System Improvement Map* (June, 2001) as amended (for proposed Helvetia Area sanitary sewer system and lines).

(G) Area Transportation System Plan.

The conceptual transportation system and facilities shown in Figure 1 are intended to support development of the land use designs and arrangements shown in the corresponding Helvetia Conceptual Illustration "A". Proposed roadway improvements include the realignment of Jacobson Road and the extensions of NW Schaff Road and NW Pubols Road through the area, consistent with the conceptual alternative design for the Area. The location and design of the transportation facilities shown in Figure 1 are conceptual and general in nature. Specific roadway alignments for these facilities and specific intersection improvements along Jacobson will be determined through future studies and shall be incorporated into the City Transportation System Plan (TSP) when such specific Area roadway alignments and intersection improvements have been firmly determined and finalized.

Helvetia concept plan

Figure 1
Conceptual Illustration A

November 2007

Legend

- Industrial Business Park
- Distribution Business

N

0 800 1,600
Feet

Angelo planning group

CH2MHILL IDC

LCG

DKS Associates
TRANSPORTATION SOLUTIONS

CITY OF HILLSBORO

Figure 2
Helvetia Site Water Infrastructure Improvement
Evergreen/Helvetia UGB Concept Plans

LEGEND

- Concept Water Main
- Existing Water Main
- Helvetia Site (Planning Area = 242.12 ac)
- Roads
- Tax Lots

N

0 500 1,000
Feet

Angelo planning group

CH2MHILL

File Path: S:\data\Proj\CityofHillsboro\Evergreen_Helvetia_UGB_Concepts\GIS\MapDocuments\Existing_Utilities\Figure1_Helvetia_project_Vicinity.mxd, Date: September 7, 2007 11:37:02 AM

Figure 3
Helvetia Concept Planning Area Sanitary Sewer System Conceptual Alternative

Evergreen/Helvetia UGB Concept Plans

LEGEND

- Gravity Pipe
- Force Main
- Helvetia Site (Planning Area = 242.12 ac)
- Roads
- Tax Lots

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Angelo planning group

CH2MHILL

\\ASTORIA\GISDATA1\DATA\PROJ\CITYOFHILLSBORO\EVERGREEN_HELVETIA_UGB_CONCEPTS\GIS\MAPDOCUMENTS\CONCEPTS\FIGURE1_HELVETIA_CONCEPT_SANITARY_SEWER.MXD 9/12/2007 14:53:06

Appendix L

Helvetia Special Industrial District (HSID)
(New Development Code Section)

Section 134C. Helvetia Area Special Industrial District (HSID)

A. **Purpose**. Helvetia Area Special Industrial District (HSID) provisions shall apply to and regulate land within the Helvetia Area shown on map Exhibit A upon adoption of this Ordinance and land annexation to the City. The purpose of the HSID is to:

1. Encourage and accommodate the *creation of larger industrial parcels* within the Helvetia Area through HSID Ordinance provisions that facilitate land assembly consolidations to create large campus-like industrial sites.

2. Facilitate and accommodate *business clusters on smaller industrial sites* within the Helvetia Area for business start-ups, incubators and spin-offs that derive from high-tech, sustainable industries and bio-tech/bio-medical/bio-pharmaceutical industry clusters and for supporting public and private facilities and utilities.

3. Accommodate land development opportunities within the Helvetia Area that can accommodate *high technology and related companies and businesses* and local, national and international *"sustainable industries" businesses and companies* (including uses that support or complement such companies and businesses).

4. Accommodate the establishment, development and growth of *"sustainable industries"* and *"bio-tech/bio-medical/bio-pharmaceutical" industries* within the Helvetia Area.

5. Support and implement the development goals, development program, and corresponding implementation measures described in Section 25, Hillsboro Area Industrial Plan, of the Hillsboro Comprehensive Plan.

B. **Applicability**. HSID Ordinance provisions apply to properties within the Helvetia Area shown on map Exhibit A. The Official City of Hillsboro Zoning Map shall be amended to incorporate the HSID Ordinance provisions which shall regulate properties within the Helvetia Area upon their annexation to the City.

C. **Definitions**. The industrial use category defined in this Section shall be interpreted and applied narrowly and exclusively to exclude from the HSID land uses that fall under other general industrial categories not specifically listed in this Section. However, the range and types of industry uses covered within each industrial category listed in this Section may be broadly interpreted and applied to include uses currently associated with the category by recognized industry classification systems and new kinds of uses that may evolve in the future from businesses in that category. As used in the application and enforcement of this HSID Ordinance:

1. *"Sustainable Energy and Environmental Businesses"* means and includes industrial businesses and land uses engaged in the research and design or development, manufacturing, processing, marketing (and combinations of such activities) of products or services associated with local, national and international sustainable energy and environmental industries. Such businesses include, but are not limited to large and small firms and companies engaged in high technology research and products development and manufacturing; solar and wind energy products and parts manufacturing; and, other high-tech and sustainable industry operations. These businesses usually require parcels of various sizes, especially large parcels (e.g., 50 – 100 or more acres in size), to accommodate vertically-integrated business operations, entirely within a single business site.

2. "*Biotech Campus*" means and includes industrial businesses and land uses engaged in research and design or development, manufacturing and processing, marketing (and combinations thereof) of bio-technology, bio-medical, bio-pharmaceutical business products or services and like-kind businesses. Biotech campuses usually require medium-sized parcels (35 – 50 or more acres in size).

3. "*Industrial Incubators, Start-ups and Spin-offs Business Parks*" means and includes small-to-medium sized specialized business parks that contain (within leased, building spaces) a mix of small, emerging industrial companies that evolve from, or support the established, larger high tech, sustainable industries and bio-tech companies nearby. Typical business parks present a unifying brand and image controlled by project covenants or conditions and restrictions (CC&Rs). Some Business Parks may provide raw industrial building space, while others may provide industrial flex building spaces. Leased spaces often contain combined business office and product production operations. These types of business parks usually require medium-sized parcels (20 – 40 acres in size).

4. "*Industry Research & Development (R&D) Parks*" means and includes industrial R&D business parks that primarily provide industry flex-space developments for vertically-integrated research and development businesses and research laboratories that develop new products and/or industry technologies in smaller campus-like projects. Industry Business Parks, R& D Parks also usually require small-to-medium sized parcels (20 – 30 acres in size).

5. "*Industry Suppliers*" means and includes businesses that manufacture, process, distribute or provide production materials, parts, product components and business services used by local high tech, sustainable industry and bio-tech businesses in the Portland Region. They include, but are not limited to suppliers of test equipment, uniforms and linens, lab supplies, sub-components and circuit boards, and packaging materials. Industry suppliers usually require smaller-sized parcels (10 – 20 or more acres in size).

6. "*Lot of Record*" means any lot or parcel of property described on Washington County Tax Maps on the date of annexation of the lot or parcel of land to the City of Hillsboro.

7. "*Contiguous Lots of Record in Common Ownership*" means all contiguous lots or parcels which are either owned by a single individual or entity at the time land is placed in this district or which are thereafter acquired by a single individual or entity.

8. "*Pre-Existing Use*" means any lawfully created use or structure established and in existence on the date of adoption of this ordinance.

D. **Standards**. All land uses, land development and lot partition and lot development requirements within the HSID shall comply with the standards contained in Sections D. and E. of this HSID Ordinance and the standards of the M-P Industrial Park Zone of Hillsboro Zoning Ordinance specifically identified or referenced in this HSID Ordinance. All land uses, land development and lot partition and lot development requirements within the HSID shall also be subject to review and approval under Section 133, Development Review/Approval, of the Hillsboro Zoning Ordinance:

1. **Land Use**.
Land uses, new development and redevelopment within the HSID shall be allowed and shall occur in accordance with the following requirements:

a. Permitted land uses:
Permitted uses within the HSID shall be limited to the kind of land uses described in the following Industrial use categories as defined in Section C of this Ordinance:

(1) Sustainable, Environmental, and Energy Businesses
(2) Biotech Campus
(3) Industry Research & Development (R&D) Parks
(4) Industrial Incubators, Start-ups and Spin-offs Business Parks
(5) Distribution Businesses
(6) Industry Suppliers
(7) Support Commercial Services [see Section D.1.d. of the HSID]
(8) Transportation facilities, including public improvements for streets, transit, parking, and bicycle and pedestrian facilities
(9) Public service or utility uses and facilities
(10) Other uses similar in type and character to the permitted use categories in this Helvetia Area as determined by the Planning Director pursuant to Section 117 of the Hillsboro Zoning Ordinance.

b. Conditional uses:
Only the following Conditional Land Uses may be permitted within the HSID when proposed, processed, approved and developed in accordance with the provisions Sections 78 to 83 of the Hillsboro Zoning Ordinance

and Section 133, Development Review/Approval, of the Zoning Ordinance:

(1) Transit Park and Ride
(2) Communication transmission facilities

c. Excluded uses:
Unless a use is permitted outright or as a conditional use, or is determined to be permissible by the Planning Director or the Planning Commission in accordance with the provisions of this HSID Ordinance, the use shall be excluded from, and may not be permitted to develop within the HSID.

d. Special Provisions for Support Commercial Services uses:

Commercial land uses within the HSID shall be limited to:

(1) Retail commercial and professional services uses that primarily serve the needs of the workers within the Helvetia and immediately adjacent industrial areas. Buildings for these retail uses and professional services shall not occupy more than 3,000 square feet of sales or service area in a single outlet, or multiple outlets that occupy more than 20,000 square feet of sales or service area in a single building or in multiple buildings that are part of the same development project.

Training facilities whose primary purpose is to provide training to meet industrial needs.

e. Pre-Existing Uses:

Any lawfully created use of any building, structure or land existing at the time of adoption of this Ordinance may continue to operate and may expand to add up to 20 percent (20%) more floor area and ten percent (10%) more land area.

2. **Lot Size**.

a. Minimum Lot Size:

(1) Industrial developments allowed by this HSID Ordinance within the HSID shall have a minimum lot size of 10 acres. All other lots of record or contiguous lots of record in common ownership within the HSID smaller than 10 acres in size may contain any business or use listed in Section D.1.a. of this Ordinance.[1]

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[1] This 10 acre minimum lot size standard for industrial developments and 10-acres lot-creation subdivision standard established by Subsection D.2.a.(1) and D.2.a.(2) for the HSID are intended to:

(2) Subdivision of parcels the HSID will be permitted for lots larger than 10 acres in size so long as the resulting land division creates one lot or parcel of at least 10 acres and the remaining lot(s) created contains at least one parcel of 5 acres of contiguous land.

3. **Implementing the City Transportation System Plan**.
The required minimum lot sizes for parcels within the HSID may be reduced in size to the extent necessary to allow the dedication and/or construction of public collector or arterial roadways necessary to implement Section 13: Transportation of the Hillsboro Comprehensive Plan.

4. **Natural & Hazard Areas**.
The required minimum lot sizes for parcels within the HSID may be reduced in size to the extent made necessary by the bisection of the lot(s) by a natural area, flood hazard area or other resource or hazard designation restricting development pursuant the provisions of the Hillsboro Comprehensive Plan or Zoning Ordinance; or for the sole purpose of segregating common or public ownership of natural areas, flood hazard areas or other natural resource or hazard areas within an industrial park.

E. **Land Development Standards**.
The following M-P District provisions shall apply to all developments within the HSID unless modified by the Planning Director as a result of Development Review to achieve improved project design, protect or enhance significant natural resources, achieve public infrastructure efficiencies and economies of scale or other practicable project development solutions.

1. **Setback Requirements**.
The yard setback requirements set forth in Section 68 of the Hillsboro Zoning Ordinance shall apply.

2. **Height of Buildings**.
The building height limits and standards set forth in Section 69 of the Zoning Ordinance shall apply.

3. **Lot Coverage**.
The maximum lot coverage standard in Section 70 of the Zoning Ordinance shall apply.

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1) Encourage and facilitate parcel aggregations and consolidations within the HSID, therefore, better accomplish the Helvetia Area UGB Condition of Approval requiring the establishment of one 50-acre industrial lot within the Helvetia Area; and,
2) Address ORS 197.352 (Ballot Measure 37) considerations.

4. **Off-Street Parking and Loading**.
The off-street parking and loading standard in Section 71 of the Zoning Ordinance shall apply.

5. **Performance Standards**.
The land and structure use and development performance standards in Section 72 of the Zoning Ordinance shall apply. In the HSID, as a condition for granting of a building permit, it shall be agreed that, upon request of the City, information sufficient to determine the extent of compliance with the performance standards in Section 72 shall be furnished by the owner of the property to which the building permit was granted or all successors and assignees of the owner. Such requests may include a requirement for continuous records of operation likely to violate the standards, for periodic checks to assure maintenance of standards, of for special surveys in the event a question arises regarding compliance with Section 72 performance standards.

F. **Development Review Standards**. All developments within the HSID are subject to, and shall comply with the development standards and procedures set forth in Section 133, Development Review/Approval of Plans, of the Hillsboro Zoning Ordinance:

1. The Planning Director shall review and may approve each proposed development within the HSID in accordance with the review standards and procedures prescribed in this HSID Ordinance and in Section 133 of this Zoning Ordinance. If the provisions of this HSID Ordinance and Section 133 are inconsistent or conflict as applied to any proposed development, the provisions of the HSID Ordinance shall apply and control.

2. Within the HSID, final development plans for any proposed land use to be built or site alteration to take place on a lot or record or contiguous lots of record in common ownership within the HSID shall comply with the applicable provisions of Section 133.

3. Any subdivision of lots and parcels within this HSID shall comply with the applicable provisions of this HSID Ordinance and the City of Hillsboro Subdivision Ordinance. If the provisions of this HSID Ordinance and the City Subdivision Ordinance are inconsistent or conflict as applied to any proposed development in the HSID, the provisions of the HSID Ordinance shall apply and control.

Exhibit A

Helvetia Area
Special Industrial Disctrict
(HSID)
Legend
Helvetia HSID
Urban Growth Boundary (UGB)
Hillsboro City Limits
HSID
Feet
0
500
1,000

Appendix M

Infrastructure Financing
Helvetia Concept Area

MEMORANDUM

Date: October 15, 2007

To: Evergreen / Helvetia Concept Plans Project Team

From: Chris Zahas, Leland Consulting Group
Tina Mosca, Leland Consulting Group

Re: Infrastructure Financing, Helvetia Concept Area

This memo summarizes projected infrastructure costs and funding sources associated with the development of the Helvetia concept area. It is assumed that private development will finance all onsite development costs (internal roads, onsite utilities, onsite open spaces and trails, etc.) and a portion of offsite development costs.

As described below, in the Infrastructure Financing Analysis, mandatory fees and charges that developers are assessed are expected to generate a surplus of revenues to finance offsite infrastructure costs associated with development of the Helvetia area. Despite the fact that no infrastructure financing gap is projected, the City may wish to explore alternative funding sources, such as urban renewal and local improvement districts (LIDs), which can be used to buy down the cost of development to attract private investment or to help pay for other planned, but unfunded improvements. Accordingly, this memo includes a brief discussion of alternative funding sources.

Infrastructure Financing Analysis

Summary of Infrastructure Costs and Sources of Funding

Infrastructure costs related to development at Helvetia will fall into the following categories:

- Transportation (including storm drainage facilities)
- Water
- Sanitary Sewer

Detailed cost information for each of these categories can be found in separate technical memorandums by DKS Associates (transportation) and CH2M Hill (water, sanitary sewer).

System development charges (SDCs) and Traffic Impact Fee (TIF) revenues generated by development in Helvetia can be used to finance offsite improvements, including systemwide improvements. SDCs generated by development may also be used to reimburse developers for offsite sanitary sewer infrastructure costs.[1]

Table 1 illustrates the estimated costs and revenues for all onsite and offsite infrastructure improvements associated with development in the Helvetia area. These are good faith estimates based on the preliminary Helvetia concept plan.

Table 1: Summary of costs and revenues associated with Helvetia development

Infrastructure Type	Costs	Developer Requirements	TIF Revenues	Resulting Balance (Costs - Revenues)
Transportation	$54,587,386	$54,212,386	$2,870,783	-$2,495,783 (surplus)
Water	$1,130,000	$1,130,000	n/a	$0
Sanitary	$3,300,000	$3,300,000	n/a	$0

As shown above, revenues generated by development in the Helvetia area are projected to exceed the combined cost of onsite and offsite infrastructure improvements needed for the Helvetia concept plan by $2.5 million. Therefore, no funding gap is anticipated. However, as described in the introduction, to attract private development, especially in the initial stages of build-out, the City could use a variety of funding sources discussed later in this document to assist with infrastructure financing costs.

Transportation

Summary of Transportation Costs

The Helvetia and Evergreen Area Future Transportation Conditions Analysis developed by DKS Associates (see separate technical memorandum) identifies transportation infrastructure improvements that build-out of the Helvetia area will require.

The projected cost of onsite transportation infrastructure in the Helvetia area is $54.2 million. An additional $375,000 in offsite transportation infrastructure costs is projected and will finance the addition of an eastbound turn late at the intersection of NW Jacobson Road and NW Century Boulevard.

Transportation Revenues

Development at Evergreen will contribute to transportation funding in two primary ways:

- **Onsite infrastructure.** Developers will construct all onsite transportation infrastructure at their own expense.

[1] Based on discussions with the Tualatin Valley Water District, development in the Helvetia concept area is not projected to necessitate any off-site water system improvements.

- **TIFs.** The City of Hillsboro collects TIFs for all new development, which is assigned to one of five general use categories: residential, business/commercial, office, industrial or institutional. TIFs are calculated based on the total trips a development is projected to generate. Within each general use category, "unit factors" are assigned to different development types and reflect the magnitude of the impacts the development is anticipated to have on the transportation system. For example, within the industrial use category, warehouses, which generally have a very low job density, will generate fewer trips than industrial parks, which have a higher job density.

  For industrial uses projected to locate in the Helvetia area, total trips are estimated by multiplying a building's total gross square footage (TGSF) by the appropriate unit factor.

Table 2 shows projected TIF revenues for the Helvetia area. Assuming a job density of 17.3 employees per acre, development in the Helvetia area is projected to produce $2.9 million in TIF revenues, which may be used to finance offsite improvements.

Table 2: Projected TIF Revenues for Helvetia concept area.

Item	Area (acres)	Building Area (s.f.)	Description	No. of Units	Total Trips (Gross Bldg s.f. x No. of Units/ 1000)	Basis of Trip Rate	TIF estimate (Basis of Trip Rate x Total Trips)
Gross area	249.0						
less BPA easement	40.0						
less infrastructure/circulation (21%)	52.0						
Net development area	157.0						
Distribution Business 1	70.0	731,808	Warehouse	4.88	3,571	$308	$1,099,937
Distribution Business 2	17.0	177,725	Warehouse	4.88	867	$308	$267,127
Distribution Business 3	10.0	104,544	Warehouse	4.88	510	$308	$157,134
Industrial Business Park (2 @ 30 ac.)	60.0	627,264	Industrial Park	6.97	4,372	$308	$1,346,585
TOTAL	157.0	1,641,341					$2,870,783

Source: Leland Consulting Group

Water

Water Costs

The Water System Concept Design developed by CH2M Hill (see separate technical memorandum) identifies water system infrastructure improvements that will be required for the Helvetia concept area, which will be served by the Tualatin Valley Water District (TVWD).

The total construction cost estimate for Helvetia area water improvements, including a 30 percent contingency, is $1.13 million.

Water Revenues

The water system improvements described above are considered onsite improvements that would be the responsibility of developers. Thus, there will be no public utility obligations to fund water infrastructure at Helvetia.

Development at Helvetia will generate revenues based on SDCs that are levied on development as it occurs. These fees, assessed by TVWD enable the District to build and maintain the internal capacity to serve the Helvetia area. The methodology for determining SDCs is described in CH2M Hills' technical memorandum. As previously noted, water demand generated by the Helvetia area can be accommodated by TVWD's existing system and will not trigger the need for any offsite improvements.

Sanitary Sewer

Sanitary Sewer Costs

The Sanitary Sewer Trunk Concept Design developed by CH2M Hill (see separate technical memorandum) proposes one alternative for providing sanitary service to the Helvetia concept area.

The total program cost estimate for Alternative 1, which will use gravity lines in Pubols Road and Schaaf Road to convey flow to a gravity mainline in Helvetia Road and construct a new pump station near the intersection of Helvetia Road and Jacobsen Road, is $3.3 Million.

Sanitary Sewer Revenues

Based on CH2M Hill's analysis of sanitary sewer infrastructure requirements, it is assumed that private development will bear the total cost of sanitary sewer improvements associated with build-out of the Helvetia area. Specifically, developer requirements will include:

- **Onsite infrastructure.** Developers will be responsible for all onsite infrastructure costs.
- **Connection fees/ SDCs.** Clean Water Services (CWS), which will be the sanitary sewer service provider for the Helvetia area, will assess SDCs to new development to finance connection charges, which may include:

  a. Direct connections to the District sewer system;

  b. Indirect connections to the District sewer system including, but not limited to, building additions, or expansions, which include sanitary facilities;

  c. Change in the use of an existing connection; and

  d. Substantial increase(s) in the flow or alteration of the character or sewage to an existing connection.

For industrial uses, connection fees will be calculated as Dwelling Unit Equivalents (DUEs) based on the estimated or actual metered flow in incoming water, or metered effluent. The fees are calibrated to match the expected true cost of any offsite improvements required by the development. Thus, there will be no unmet funding obligation as a result of development at Helvetia.

Alternate Funding Tools

As described above, to facilitate private development, additional funding tools may be needed to assist with onsite infrastructure costs in Helvetia. A wide range of funding tools is available to support capital improvements and infrastructure planning in Oregon. Many transportation funding tools are funded via the Oregon Department of transportation (ODOT) through competitive grants that are offered annually or biannually. Local funding tools, such as urban renewal and LIDs, may be used to finance capital improvements within designated geographic areas.

The following programs and funding tools are some of the most common and most likely to be of use in the Helvetia concept area.

- **Tax Increment Financing/Urban Renewal**. Tax increment financing (TIF) is one of the most powerful public funding tools for revitalization. TIF is a mechanism where public projects are financed by debt borrowed against the future growth of property taxes in a defined urban renewal district. The assessed value of all properties within the district is set at the time the district is first established (the frozen base). As public and private projects enhance property values within the district, the increase in property taxes over the base (the increment) is set aside. Debt is issued, up to a set maximum amount (the maximum indebtedness), to carry out the urban renewal plan and is repaid through the incremental taxes generated within the district. The duration of urban renewal districts is usually 15 to 20 years. When the district is retired, the frozen base is removed and all property taxes in the district return to normal distribution. Because urban renewal is such a useful tool for revitalization and can generate significant amounts of money for infrastructure, it should be strongly considered to help fund projects in the Helvetia area. As a part of subsequent conceptual plan implementation, the City would need to prepare an urban renewal plan, which would identify specific projects to be funded and the likely funding capacity from tax increment revenues.

- **Local Improvement District.** A Local Improvement District, or LID, is a special assessment district where property owners are assessed a fee to pay for capital improvements such as sidewalks, underground utilities, shared open space, and other features. LIDs are typically petitioned by and must be supported by a majority or supermajority of the affected property owners. Since LIDs are funded by private property owners, they can help share the funding burden in a public-private partnership. Further, since it requires private property owner support, it is a good mechanism to help organize property owners around a common goal. Such a mechanism could be a useful tool to fund shared amenities and infrastructure at Helvetia.

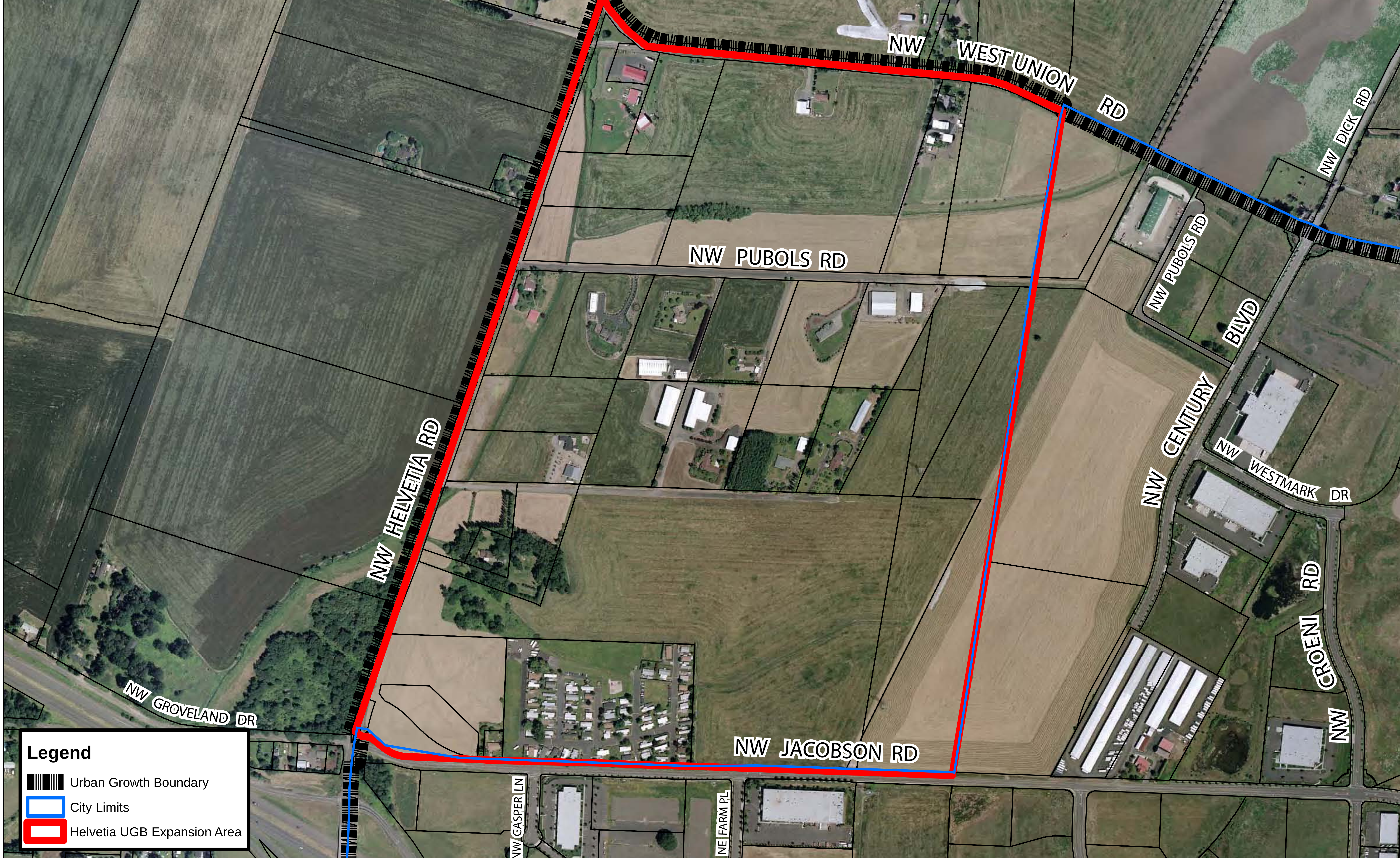
- **Oregon Pedestrian and Bicycle Program (ODOT).** A range of pedestrian and bicycle improvements will be a part of the Helvetia transportation infrastructure. ODOT provides grants for crosswalks, bike lane striping, and pedestrian crossing islands that fall within the rights-of-way of streets, roads and highways. Bike/ped grants usually fall between $80,000 and $500,000.

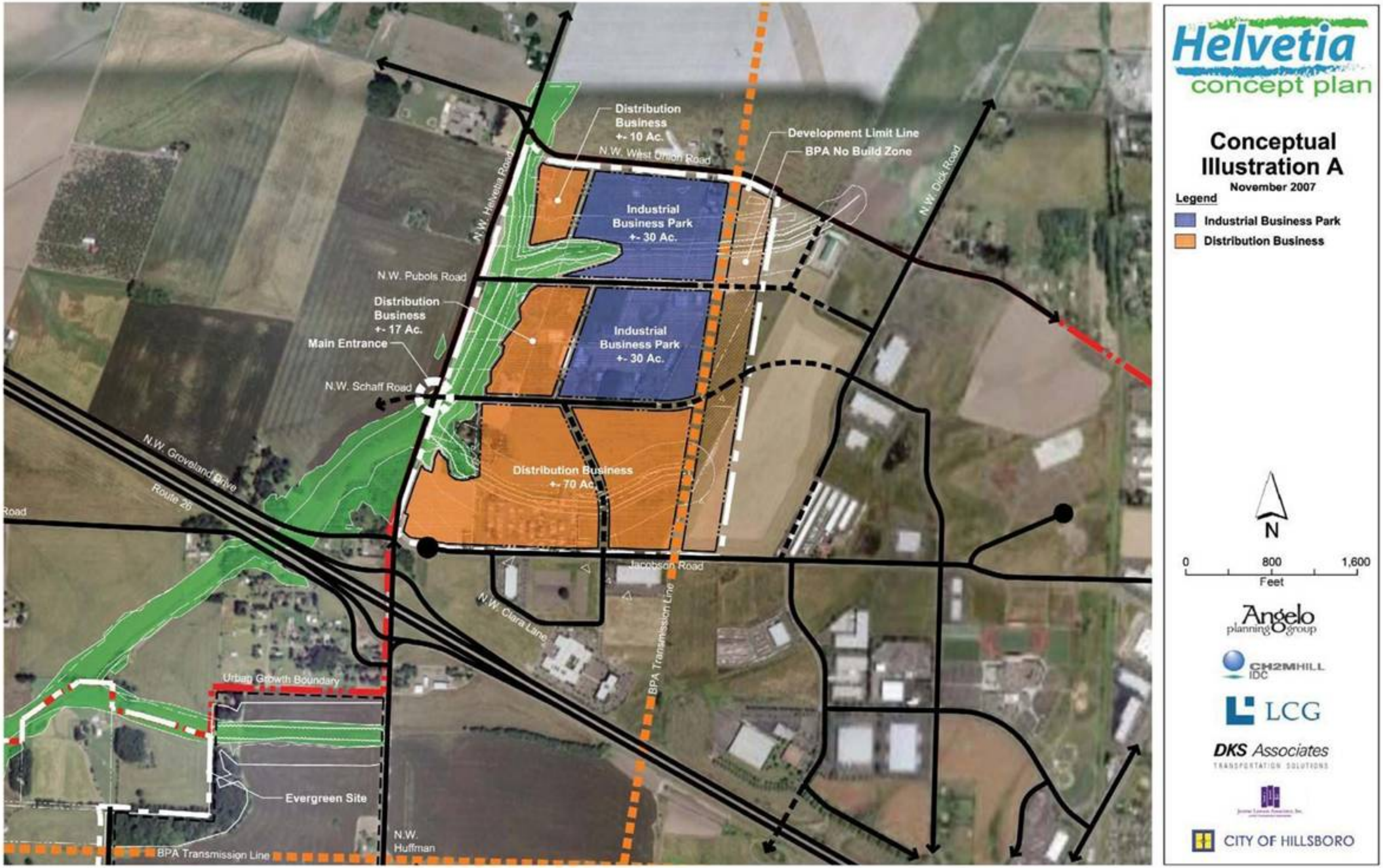
- **Oregon Transportation Enhancements (TE) Program**. Using federal transportation funds, ODOT TE grants are awarded to local governments and other public agencies to support projects that improve communities and enhance the experience of traveling. New sidewalks, bike lanes, and pedestrian amenities such as benches and streetlights are eligible TE projects, as are the restoration of historic railroad stations, bus stations, and bridges. TE awards typically range from $200,000 to $1 million, and local governments must contribute ten percent of the project's cost.

- **Major Streets Transportation Improvement Program (MSTIP).** Washington County voters approved a third version of the MSTIP in 1995. The MSTIP uses property tax revenue to issues bond for capital construction of major transportation projects with Countywide benefit. Most of these projects take place on County roads. From FY06-07 through FY11-12, $140 million has been allocated for projects in MSTIP C3.

- **ODOT Transportation Growth Management Program.** ODOT provides grants to local governments in Oregon for a variety of purposes including updating land use and transportation plans, making walking and biking safer and more convenient, improving access to transit, improving the pedestrian-friendliness of downtowns and Main Streets, amending local codes to encourage "transportation efficient" development, and creating better connections between local destinations.

Helvetia Concept Plan Area





Helvetia concept plan
Conceptual Illustration A
November 2007
Legend
Industrial Business Park
Distribution Business
Distribution Business +- 10 Ac.
Development Limit Line
BPA No Build Zone
N.W. West Union Road
N.W. Helvetia Road
N.W. Dick Road
Industrial Business Park +- 30 Ac.
N.W. Pubols Road
Distribution Business +- 17 Ac.
Main Entrance
Industrial Business Park +- 30 Ac.
N.W. Schaff Road
N.W. Groveland Drive
Route 26
Road
Distribution Business +- 70 Ac.
Jacobson Road
N.W. Clara Lane
BPA Transmission Line
Urban Growth Boundary
Evergreen Site
N.W. Huffman
BPA Transmission Line
N
0 800 1,600
Feet
Angelo planning group
CH2MHILL IDC
LCG
DKS Associates TRANSPORTATION SOLUTIONS
CITY OF HILLSBORO