**Transportation System Plan Update**
**Technical Advisory Committee**
**Meeting #2 Agenda**

9:00AM-11:00 AM
Thursday, Nov 3, 2016

Conference Room 431
150 E. Main Street

| Time | Topic |
|---|---|
| 9:00 | A. Project update |
| 9:05 | B. Draft transportation goals and policies discussion |
| 10:50 | C. Draft Existing Conditions Report discussion |
| 11:00 | D. Adjourn |

**MEMORANDUM**

**To:** Technical Advisory Committee (TAC) - Transportation System Plan (TSP) Update

**From:** Brad Choi, Transportation Planner

**Date:** November 3, 2016

**Subject**: Draft Transportation Goals and Policies Review

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The primary objective of the second TSP TAC meeting is to review the draft transportation goals and policies.

Draft Goals and Policies

TAC received a project introduction and reviewed the Comprehensive Plan Transportation Background Report at a joint meeting with the Comprehensive Plan Technical Advisory Committee on August 24, 2016.

The City is currently updating the Comprehensive Plan as well as the TSP. The updated transportation goals and policies that come out of the Comprehensive Plan update process will form the foundation of the new TSP and guide project development and selection. The two plan update processes are closely coordinated to ensure consistency.

The draft transportation goals and policies were developed by an internal work group consisting of City planning staff with input from external consultants. In addition to this TSP TAC, the transportation goals and policies will also be reviewed by the TSP Steering Committee, the Comprehensive Plan Citizens Advisory Committee (CAC) and Technical Advisory Committee (TAC), the Hillsboro Planning Commission, and the Hillsboro Transportation Committee.

Existing Conditions Report

As part of the TSP update, an Existing Conditions Report is being developed to inventory and analyze the existing transportation system and operating conditions. The Existing Conditions Report included in this packet is an early draft of the document. The report will continuously be updated over the course of the TSP update process. TAC members are encouraged to review the document and provide feedback at any time throughout the duration of the TSP update. It will not be a main focus of this meeting.

**Attachments:**

1. Draft transportation goals and policies
2. Draft Existing Conditions Report

# Cultivating Transportation Options

*Goals and Policies DRAFT – October 20, 2016*

### Review History

| Date | Reviewed By |
|---|---|
| 10.13.2016 | Comprehensive Plan Technical Advisory Committee (Goals 1-3) – *Comments Incorporated* |
| | |

### Source Notes & Annotations

Sources for policies carried forward are noted in parenthesis. Examples:

- (1-1): Policy subject from the 2004 TSP. (e.g. 2-3 means Goal 2, Policy 3). Wording may be different.
- (A): Implementation measure from the current Comp Plan (begins on page 72 of current plan). Implementation measure language included below was rewritten to match Comp Plan style.

## GOAL 1 Safety: Develop and maintain a transportation system* that seeks to eliminate fatalities and serious injuries.

POLICY 1.1 **Safety for all modes.** Develop and maintain the transportation system* to enable users of all modes*, including pedestrians, cyclists, drivers, and those taking transit, to feel equally safe and comfortable. (1-1)

POLICY 1.2 **Protection of vulnerable users.** Prioritize investments to improve safety for more vulnerable system users*, including pedestrians, bicyclists, and those that need special accommodations under the Americans with Disabilities Act. (NEW)

POLICY 1.3 **Minimize conflicts.** Design roadways and manage access to minimize user conflicts and improve safety. (1-4, partial)

POLICY 1.4 **Pedestrian network safety.** Improve safety of sidewalks and pedestrian crossings, particularly near schools, transit stops and stations, and public facilities. (NEW)

POLICY 1.5 **Safety monitoring and mitigation.** Monitor the City transportation system* to identify, prioritize, and mitigate safety issues, and improve high-incident locations* for all modes*. (1-2)

POLICY 1.6 **Education, awareness, and enforcement.** Partner across agencies and departments to improve transportation system* safety education, awareness, and enforcement. (1-3)

POLICY 1.7 **Emergency services access.** Require adequate access to properties for emergency services vehicles throughout the City. (1-5)

POLICY 1.8 **Rail crossing safety.** Design rail crossings to be safe for all users. (1-8)

* Asterisks indicate terms with specific definitions included at the end of this section.



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POLICY 1.9 **Street and path lighting.** Require appropriate illumination that provides for the safety of all users. (NEW)

## GOAL 2 Multi-modal: Provide a balanced and connected multi-modal* transportation system*.

POLICY 2.1 **Multi-modal corridors and facilities.** Design transportation corridors* and facilities that accommodate and promote the use of multiple modes* of travel to move people, goods and services. (2-1)

POLICY 2.2 **Network design for each mode.** Establish and enhance easily-navigable citywide networks for pedestrian, bicycle, automobile, and freight traffic that are integrated and interconnected into a comprehensive multi-modal* system.

POLICY 2.3 **Connecting destinations.** Provide multi-modal* transportation options within, between, and in close proximity to Regional Centers*, Employment Areas*, Transit Station Communities*, Town Centers*, Neighborhood Centers*, Corridors*, and major destinations. (NEW)

POLICY 2.4 **Low-stress alternatives.** Develop pedestrian- and bicycle-friendly alternatives to arterials and collectors for multi-modal travel to serve local needs. (7-4)

POLICY 2.5 **Network connectivity.** Facilitate measures to increase multi-modal* connectivity between existing, new, and future development. (M)

POLICY 2.6 **Transit expansion.** Commit to improving local and regional transit service, particularly the availability of frequent transit service including evening and weekend service, in all areas of the City. (2-5)

POLICY 2.7 **High-Capacity Transit.** Plan for the expansion of high-capacity transit* service to enhance mobility options, increase overall transit use, and better connect local and regional employment, commercial, and residential areas. (NEW)

POLICY 2.8 **Bicycle and pedestrian facilities.** Improve and expand bicycle and pedestrian facilities in conjunction with roadway construction or reconstruction projects. (2-2, portion)

POLICY 2.9 **Bicycle and pedestrian access.** Ensure safe and convenient access to existing or planned bike and pedestrian facilities from nearby schools, transit, parks, public facilities, employment and retail areas. (2-2, portion)

POLICY 2.10 **Trails connectivity.** Connect local off-street trails with regional trail systems and local pedestrian and bicycle networks where feasible as part of an integrated transportation system*. (2-4)

POLICY 2.11 **Bicycle facility design.** Create a bicycle system to accommodate users of various abilities. (NEW)

POLICY 2.12 **Bicycle parking.** Promote the provision and maintenance of publically-accessible bicycle parking facilities in new and existing development. (NEW)

* Asterisks indicate terms with specific definitions included at the end of this section.

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## GOAL 3 Trip Reduction: Reduce the number of vehicle trips and per capita vehicle miles traveled.

POLICY 3.1 **Reduce vehicular miles traveled.** Foster the reduction of single-occupancy vehicular miles traveled to improve efficiency of the existing system. (3-1)

POLICY 3.2 **Coordinate land use and transportation.** Align land use designations and zoning with transportation system* planning to focus higher residential densities, mixed-use development, employment centers, and other more intense land uses in areas that are well-served by multiple modes*, particularly transit. (NEW)

POLICY 3.3 **Mode shift.** Plan a transportation system that aims to increase the share of travel in the City by more efficient modes*. (NEW)

POLICY 3.4 **Transit-oriented development.** Facilitate compact, mixed-use development oriented around and served by frequent transit service in areas of the City designated for more intense land uses. (K)

POLICY 3.5 **Facilitate pedestrian and bicycling trips.** Prioritize walking and bicycling as the preferred modes* of transportation for most short trips. (NEW)

POLICY 3.6 **Transportation demand management.** Support the use of transportation demand management* measures including carpools, vanpools, telecommuting, technology, and staggered work hours as a means of reducing peak commute period traffic demand. (L)

## GOAL 4 System Design: Plan and implement a City transportation system* that accommodates current and future needs.

POLICY 4.1 **Functional classifications.** Organize the roadway network around a street classification* hierarchy that describes how different types of streets address mobility and access to, through, and between different land uses. (NEW)

POLICY 4.2 **Standardized cross-section designs.** Develop and maintain standardized street cross-section design standards for public roadways that reflect intended land uses and design characteristics. (O)

POLICY 4.3 **Special classification design standards.** Establish specialized design standards when necessary to address the unique context of individual roadways and/or surrounding land uses. (C, D)

POLICY 4.4 **Special designs.** Allow deviation from standardized and special classification design standards where proposed designs support adjacent uses, address unique constraints, and provide for acceptable performance. (P)

POLICY 4.5 **Design for different vehicle scales.** Design the transportation system* to accommodate different sizes and types of vehicles. (NEW)

* Asterisks indicate terms with specific definitions included at the end of this section.

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POLICY 4.6 **Minimize out of direction travel.** Design the local street network to facilitate street connectivity and prevent out-of-direction travel. (7-3, portion)

POLICY 4.7 **Right-of-way preservation.** Identify and protect right-of-way* for potential future public use necessary to accommodate needs and demands. (NEW)

POLICY 4.8 **New road alignments.** Ensure equitable distribution of burdens and benefits on local property owners when determining new road alignments. (NEW)

POLICY 4.9 **Parking supply.** Maintain standards to ensure appropriate parking capacity for all modes. (3-4)

POLICY 4.10 **Area-specific parking management.** Create area-specific parking management plans where appropriate, and ensure parking standards that address needed capacity to support development.

POLICY 4.11 **Public safety coordination.** Coordinate with law enforcement and emergency response agencies in the planning and design of transportation facilities and emergency response procedures. (NEW)

POLICY 4.12 **Regional consistency.** Ensure consistency with regional street design guidelines on streets identified in the Metro Regional Transportation System Plan. (N)

## GOAL 5 Performance: Manage the City transportation system* to maximize capacity while ensuring efficiency and safety.

POLICY 5.1 **System performance standards.** Meet system performance standards consistent with local and regional goals. (4-1, portion)

POLICY 5.2 **Emerging performance measurements.** Explore the feasibility and applicability of emerging methods of measuring and evaluating transportation system* performance and safety. (NEW)

POLICY 5.3 **Address congestion.** Invest in the transportation system* to manage congestion consistent with local performance and safety goals. (4-1, portion)

POLICY 5.4 **Development impacts.** Place appropriate conditions on proposed land use actions to manage and mitigate the impacts of new development*, infill development*, and redevelopment* on local and regional transportation systems*, including system capacity and right-of-way* area.

POLICY 5.5 **Systemwide technologies.** Collaborate with regional and state partners to develop, operate and maintain Intelligent Transportation Systems* including coordination of traffic signals, transit prioritization, and the integration of other emerging technologies. (4-2)

POLICY 5.6 **Emerging user technologies.** Support the use of emerging technologies to improve the overall efficiency and safety of the transportation system*. (NEW)

POLICY 5.7 **Monitor performance.** Define and monitor metrics addressing system performance and user characteristics such as safety, demand, trip types,

* Asterisks indicate terms with specific definitions included at the end of this section.



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congestion, mode* share, origin-destination patterns, and jobs-housing balance. (NEW)

## GOAL 6 Economy: Utilize the transportation system to support and sustain local and regional economic development.

POLICY 6.1 **Goods and services movement.** Design the transportation system* to facilitate the efficient movement of goods, services, and equipment. (5-1)

POLICY 6.2 **Continued use of facilities.** Support the continued use and development of rail, air, and pipeline transportation facilities. (5-3)

POLICY 6.3 **Airport planning coordination.** Coordinate with the Port of Portland in planning for the Hillsboro Airport. (5-2)

POLICY 6.4 **Standards coordination.** Ensure compliance with federal, state and local safety and design standards in the operation, construction and maintenance of rail, pipeline, and arterial* roadway systems. (1-7)

POLICY 6.5 **Hazardous materials.** Require safe routing of hazardous materials* within the City. (5-4)

## GOAL 7 Livability: Integrate the transportation system* with neighborhoods and places.

POLICY 7.1 **Impact mitigation.** Design and manage the transportation system* to mitigate significant potential livability and environmental impacts. (6-4 and 6-5)

POLICY 7.2 **Context-sensitive street design.** Plan and design streets that reflect their intended use, are compatible and well-integrated with surrounding neighborhoods, and accommodate planned land uses and system users. (6-2)

POLICY 7.3 **Attractive pedestrian environment.** Develop attractive pedestrian environments by coordinating landscape design, street trees, utility placement, safety features, lighting, transit stop amenities, and other streetscape amenities that support pedestrian use in compliance with applicable City standards. (6-3)

POLICY 7.5 **Minimize non-local neighborhood traffic.** Manage the transportation system* to minimize non-local motorized vehicular traffic within residential neighborhoods.

POLICY 7.6 **Minimize speeding.** Incorporate design features to minimize speeding on local* and neighborhood routes*. (6-1)

POLICY 7.7 **Health and wellness impacts.** Prioritize transportation investments that promote positive health outcomes through measures such as active transportation and physical activity, while reducing pollution and environmental impacts. (NEW)

* Asterisks indicate terms with specific definitions included at the end of this section.



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POLICY 7.4 **Natural and green infrastructure.** Support the integration of natural and green infrastructure* into the transportation system*, including street trees, pervious pavement, the use of vegetated stormwater management, and alternative design techniques where appropriate. (U)

POLICY 7.8 **Promote environmental sustainability.** Pursue transportation system* investments that expand the use of renewable energy, reduce environmental impacts, lower noise levels, and reduce emissions of greenhouse gases. (NEW)

POLICY 7.9 **Airport compatibility.** Promote compatibility* between the Hillsboro Airport and surrounding uses by limiting noise-sensitive uses* within airport noise corridors and avoiding the establishment of uses that are physical hazards to air traffic. (1-6)

## GOAL 8 Equity: Reduce barriers and improve equity for all users.

POLICY 8.1 **Transportation system equity.** Manage transportation system* operations and investments to provide residents of all ages, cultures, incomes, and abilities with affordable, reliable, convenient, and safe transportation options to meet daily needs. (NEW)

POLICY 8.2 **Reduce barriers for biking, walking, and transit.** Reduce barriers for pedestrians, bicyclists, and transit users while maintaining compatibility* with surrounding land uses through design standards and transportation system* investments. (NEW)

POLICY 8.3 **Expand access to transit.** Expand access to local and regional transit service to areas of the City that have historically been underserved by transit.

POLICY 8.5 **Education and awareness.** Support measures to expand awareness of transportation resources and options across all of the City's diverse communities. (NEW)

POLICY 8.4 **Americans with Disabilities Act.** Construct and pursue retrofit of transportation facilities to conform to the requirements of the Americans with Disabilities Act. (7-1)

## GOAL 9 Funding: Provide adequate funding for transportation system* maintenance and enhancement.

POLICY 9.1 **Transportation Financing Plan.** Develop and maintain an overall Transportation Financing Plan that addresses investments in all modes* over the next 20 years, prioritizes investments to meet community goals, and identifies stable funding sources and mechanisms. (NEW)

POLICY 9.2 **Capital improvement program.** Develop and maintain a prioritized capital improvement program for transportation projects. (G)

* Asterisks indicate terms with specific definitions included at the end of this section.



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POLICY 9.3 **Balanced revenue sources.** Provide a cost-effective transportation system* with balanced revenue sources including the public, developers, and users. (NEW)

POLICY 9.4 **Funding diversity.** Support exploration of creative, non-traditional transportation funding sources that align with City needs and priorities. (NEW)

## DEFINITIONS

**Compatibility:** The ability of adjacent uses to exist together without significant discord or disharmony.

**Corridors:** See Design Type Designations in Design & Development Goals & Policies. *(Note: See also "Transportation Corridors" below.)*

**Employment Areas:** See Design Type Designations in Design & Development Goals & Policies.

**Green Infrastructure:** Public or private assets — either natural resources or engineered green facilities — that protect, support, or mimic natural systems to provide stormwater management, water quality, public health and safety, open space, and other complementary ecosystem services. Examples include trees, ecoroofs, green street facilities, wetlands, and natural waterways.

**Hazardous Materials:** A substance or material capable of posing an unreasonable risk to health, safety, or property.

**High-Capacity Transit:** Public transit using vehicles that make fewer stops, travel at higher speeds, have more frequent service, and carry more people than local service transit such as typical bus lines. High-capacity transit service can be provided by a variety of vehicle types including light rail, commuter rail, streetcar, and bus, using an exclusive right-of-way, a non-exclusive right-of-way, or a combination of both.

**High-Incident Locations:** Highway or road segments that are susceptible to an inordinate number of crashes, usually the result of poor road design, absence of appropriate traffic signing or signals, or lack of enforcement. Identification of high crash locations are a desirable part of the problem identification process.

**Infill development:** Additional development on already developed lots, usually achieved through subdividing the lot or otherwise increasing its density.

**Intelligent Transportation Systems (ITS):** The application of a broad range of communications-based information, control and electronics technologies to improve the efficiency and safety of transportation systems. ITS can be integrated into the transportation system infrastructure and in vehicles to help monitor and manage traffic flow, reduce congestion, provide alternate routes to travels, and improve safety.

**Mode:** The different means by which people and freight achieve mobility, such as cars, motorcycles, trucks, other vehicles, transit, bicycles, and walking.

**Multi-modal:** Transportation facilities or programs designed to serve many or all methods of travel, including all forms of motor vehicles, public transportation, bicycles and walking.

**Neighborhood Centers:** See Design Type Designations in Design & Development Goals & Policies.

* Asterisks indicate terms with specific definitions included at the end of this section.

**Noise-Sensitive Uses:** Uses that may be subject to stress and/or significant interference from noise, often including but not limited to parks, open space, residences, hospitals, hotels, schools, libraries, churches and similar uses. Occupied habitat for threatened or endangered wildlife species may also be considered noise-sensitive.

**Redevelopment:** Construction of new structures, expansion or change of existing structures or building footprints, reconfiguration of existing driveways or parking, and site grading related to such additions, changes, or reconfigurations.

**Regional Centers:** See Design Type Designations in Design & Development Goals & Policies.

**Right-of-way:** An area of land dedicated, deeded or granted to the public to accommodate public uses such as a portion of a transportation system or public utility system. Examples of rights-of-way include transportation routes for motor vehicles, transit, bicycles, and pedestrians, and public utility corridors for water, sewer, and storm water lines, and for power lines and gas lines where adequate public utility easements are not available.

**Street Classifications:** A functional hierarchy that describes how different types of streets address mobility and access to, through, and between different land uses.

> *Arterial***:** A street intended to serve as a primary route for travel between the City and other parts of the region or between major areas of urban activity.
>
> *Collector:* A street providing both access and circulation within residential and commercial/industrial areas. Collector streets may penetrate residential neighborhoods distributing trips for the local and neighborhood route systems.
>
> *Neighborhood:* A street providing connectivity between local residential streets and collector streets or arterial streets, used by residents in an area to enter or exit a neighborhood but not serving as citywide area circulation.
>
> *Local:* A street intended to serve only abutting land.

**Town Centers:** See Design Type Designations in Design & Development Goals & Policies.

**Transit Station Communities:** See Design Type Designations in Design & Development Goals & Policies.

**Transportation Corridor:** Any land area designated by the State, a county, or a municipality which is between two geographic points and which area is used or suitable for the movement of people and goods by one or more modes of transportation, including areas necessary for management of access and securing applicable approvals and permits. *(Note: Transportation Corridors are distinct from the Corridor Design Type Designation described in the Design & Development Goals & Policies.)*

**Transportation Demand Management:** General term for strategies designed to optimize system performance through techniques such as the use of alternative modes, ridesharing, car sharing and vanpool programs, telecommuting, and providing flexible work schedules. Managing demand is about providing all travelers with choices of location, route and time, not just mode of travel.

**Transportation system:** Various transportation modes or facilities (aviation, bicycle and pedestrian, throughway, street, pipeline, transit, rail, water transport) serving as a single unit or system.

**Vulnerable system users:** Transportation system users that are at most at risk of injury or death in traffic, often including pedestrian, cyclists, children, and those with mobility impairments.

* Asterisks indicate terms with specific definitions included at the end of this section.

# Transportation System Plan

Draft Existing Inventory and Conditions Report
(10/20/16)

## 1. Introduction

This Existing Inventory and Conditions Report is one in a series of documents that will support the development of the new Hillsboro Transportation System Plan (TSP). This document provides a snapshot and an inventory of the current transportation system, including all elements of roadway system, as well as public transit, rail, air, freight, in the City to provide the context and background necessary as we prepare to assess the future needs of the transportation system later in the TSP process.

This document is organized into five general sections. The sections and the topics discussed in each section are as follows:

1. Introduction
    - Transportation System Plan background
    - Study area
2. Land Use and Demographics
    - Land Use, population, and employment
    - Demographic trends
    - Commute patterns
3. System Inventory
    - Roadway system including functional classification, jurisdiction, number of lanes, etc.
    - Bicycle and pedestrian facilities
    - Public transit services
4. System Performance
    - Existing operations at key intersections
    - Crash data safety performance
5. Other Elements
    - Freight, aviation, pipeline, communications infrastructure, demand management

### 1.1. Background

The City of Hillsboro Transportation System Plan (TSP) is the City's adopted plan for transportation investments for the next 20 to 25 years. The State of Oregon's Transportation Planning Rule (TPR) requires jurisdictions throughout Oregon to prepare and adopt regional or local transportation plans that serves as the transportation element for their comprehensive plans (OAR 660.012.0015 (2) (4)). The City's TSP would serve this purpose and include an inventory of the existing transportation system, analyze future needs for users of the transportation system including motorists, transit users, pedestrians, bicyclist, and freight users, and develop and prioritize a set of transportation investments for the next 20 to 25 years.

TSPs are typically updated about every 10 years to account for changing growth trends and policies. The City's current TSP was adopted in 1999 and then underwent a partial update in 2004. Since then, it has

gone through numerous amendments to respond to growth and land use changes. The trend of growth in population and employment has meant that in recent years, a significant amount of technical analysis has been completed for various target areas in the City such as South Hillsboro, North Hillsboro, Downtown, Tualatin-Valley (TV) Highway, and AmberGlen/Tanasbourne. This TSP update will serve as a platform to bring together all of the previously completed transportation planning work, and make adjustments where necessary to ensure uniformity and compatibility with the current TSP update requirements.

In addition, the City is currently undergoing an update of its Comprehensive Plan, which will result in an updated list of transportation goals and policies. The new Comprehensive Plan transportation goals and policies will serve as the guiding framework in the development of the TSP.

## 1.2. Study Area

Assumptions about the City's future boundaries have changed substantially since the last TSP update in 2004. More than 3,000 acres of land adjacent to the City have been brought into the UGB that were not part of the 2004 TSP study area. The study area in this TSP will include areas that will be, or have the potential of being, under the City's jurisdiction in the next 20+ years—such as in South Hillsboro, North Hillsboro, Witch Hazel South, and areas identified in Senate Bill 122 and House Bill 4078. These areas will have direct impact to the City's transportation system in the 20- to 25-year planning horizon. Figure 1 depicts the study area being evaluated in the TSP.

### 1.2.1. Senate Bill 122

Senate Bill (SB) 122, which was passed in 1993 and later codified in Oregon Revised Statute (ORS) 195, created a mechanism for cities to annex unincorporated areas within their UGB and defined future boundaries. The bill requires cities to determine the providers of long-term services to urban areas for sewer, water, fire protection, streets, mass transit, parks, recreation, and open space. Under SB 122, providers of future services for the Aloha-Reedsville community are divided along school district lines between the Cities of Hillsboro and Beaverton, with Hillsboro providing services to unincorporated areas within the Hillsboro School District (Reedville) and the City of Beaverton providing services to areas within the Beaverton School District (Aloha), should the communities decide to pursue annexation in the future.

### 1.2.2. House Bill 4078

An expansion to the regional Urban Growth Boundary (UGB) proposed by Metro was finalized under House Bill (HB) 4078, which was passed in 2014. The bill also defined Urban and Rural Reserves and undesignated land areas in Washington County. HB 4078 added land to the regional UGB in the North Hillsboro area along US 26 (often referred to as the Sunset Corridor), designated some previously undesignated land as Rural Reserves, and changed some areas that were previously designated Urban Reserves to Rural Reserves. The bill also undesignated a small amount of Urban Reserves.

### 1.2.3. Common Referred to Areas in the City

There are several other areas in the City that will be referred to in this document and throughout the TSP. These are identified below and illustrated in Figure 1.

- Downtown
- AmberGlen

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- Orenco
- North Hillsboro
- South Hillsboro
- Tanasbourne
- Witch Hazel

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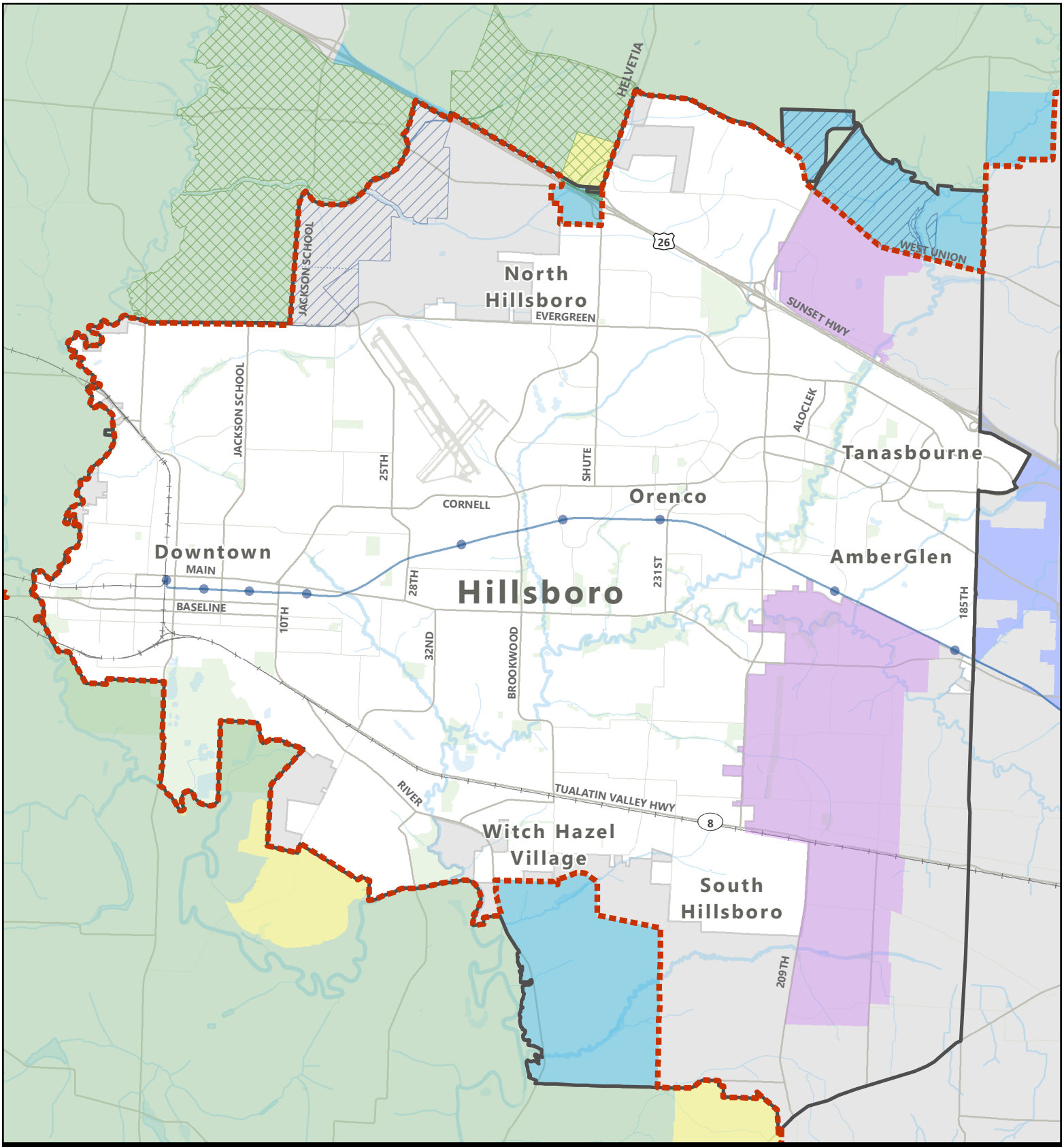


## Figure 1 - Study Area

Urban Growth Boundary
City Limits
Unincoporated Washington County
Senate Bill 122 Boundary

**HB 4078 Influence**
Removed from Developable Area
Added to Developable Area

Urban Reserve
Rural Reserve
Undesignated Land

N
0 2,500 5,000 Feet

Data Source: City of Hillsboro 2016, Metro 2016 | Plot Date: October 05, 2016

Hillsboro Planning

Hillsboro Planning Department
150 East Main St, Hillsboro, Oregon

# 2. Land Use and Population

The inventory of land use and population will inform the analysis of existing and future conditions. Land use is a key factor in developing a functional transportation system; the amount of land planned for development, the types of land use, and how they relate to each other have a direct relationship to the anticipated demands on the transportation system. Similarly, makeup of the population influences the types of facilities and programs needed to successfully meet community travel demands.

## 2.1. Existing Land Use

The currently adopted Hillsboro Comprehensive Plan land use designations are illustrated in Figure 2. It shows where broad categories of land uses are occurring in the City and planned for in future growth areas. Identification of the geographic boundaries of the land use is part of a larger comprehensive planning process that is directed by input from the community. This map provides direction for new development activity and a level of certainty for existing residents and businesses.

Connecting residents and workers to services they use on a daily basis can be accomplished by well-considered land use planning. For example, Hillsboro has designated land uses for Station Community Planning Areas, which is land that is identified for transit-oriented development. This type of development can help concentrate growth in compact, walkable areas that are adjacent to light rail stations, providing more transportation options to the people who live or work there. Placing housing near community and retail services, ensuring that schools and hospitals are well located, and providing for development of major employment uses that have access to transit all serve to increase accessibility.

In addition to the Comprehensive Plan land use designations, it is useful to understand the locations of key community features including libraries, parks, activity centers, high schools, and recreation areas in the planning the transportation system. These community features are highlighted in Figure 3. Also identified in Figure 3 are Title 1 elementary schools which are schools with a high percentage of students from low-income families. These are locations worth noting when considering the transportation system and the type of services and investments necessary to provide access and mobility to their users.

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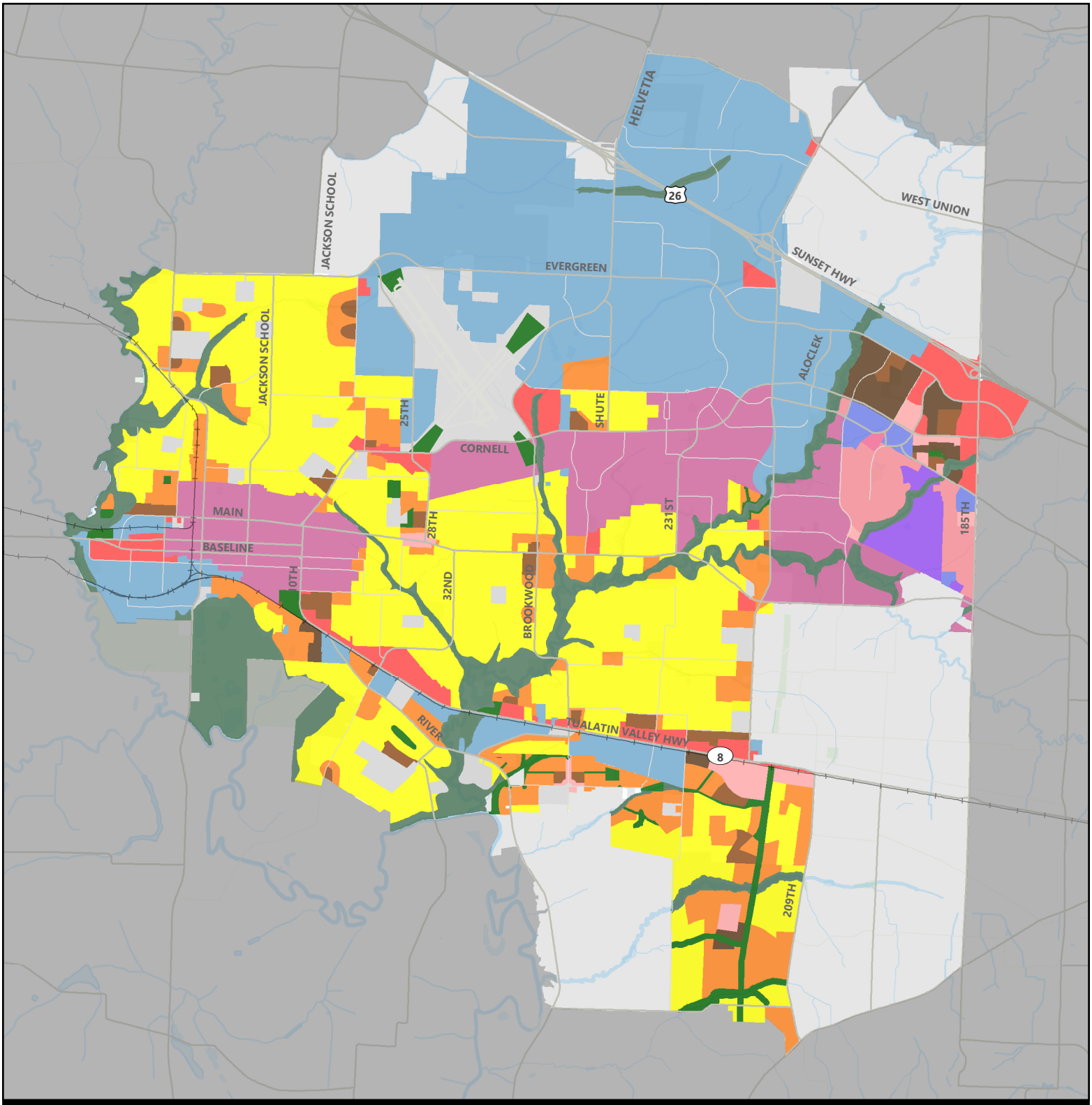



## Figure 2 - Land Use

- Residential Low Density
- Residential Medium Density
- Residential High Density
- Residential Mid-Rise Density
- Commercial
- Station Community Planning Area
- Mixed-Use
- Mixed-Use - Urban Residential
- Mixed-Use - Urban Commercial
- Mixed-Use - Urban Employment
- Mixed-Use - Institutional
- Recent Annexation
- Open Space
- Floodplain
- Public Facility
- Industrial

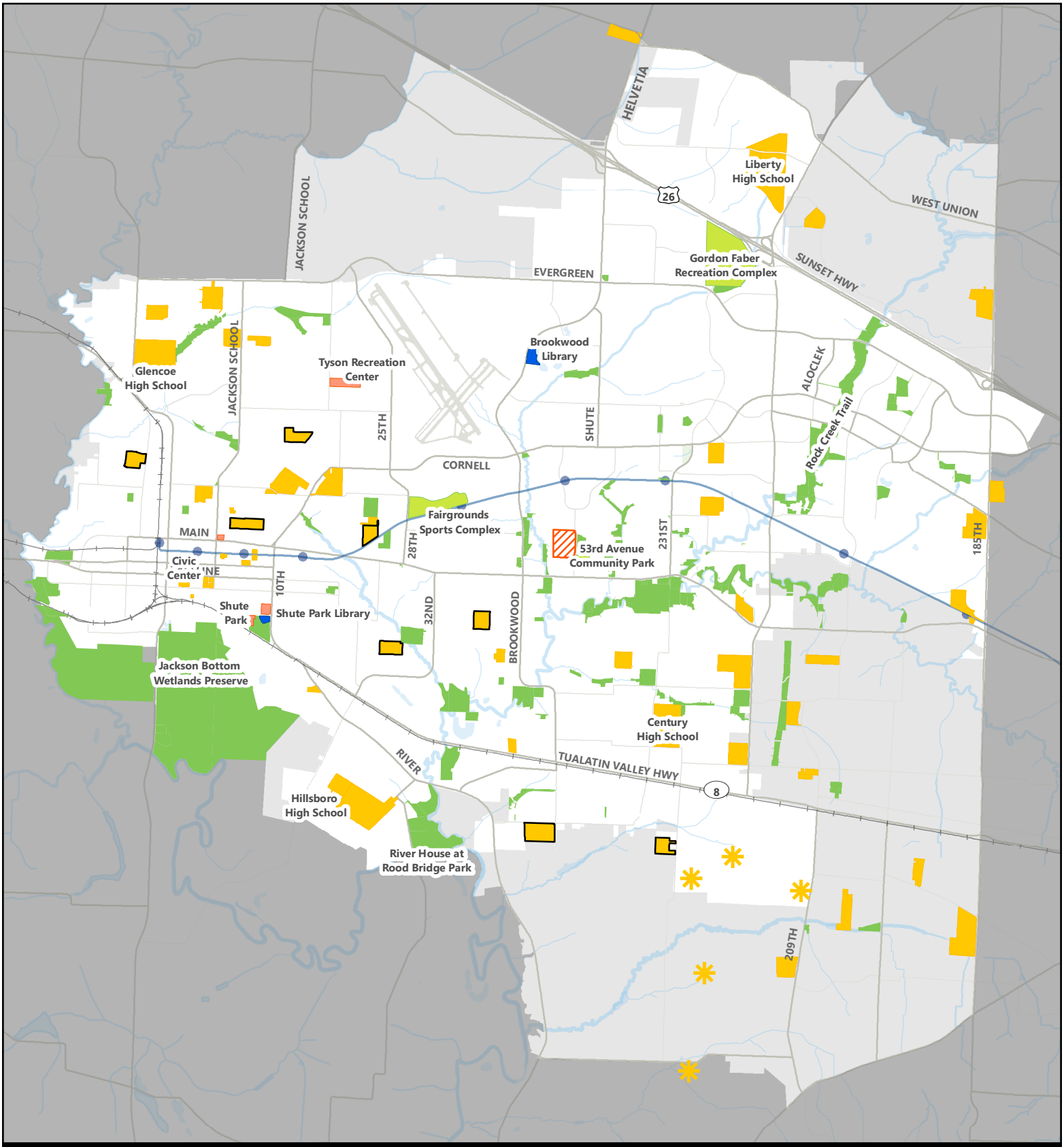
N

0 2,500 5,000 Feet

Data Source: City of Hillsboro 2016 | Plot Date: September 15, 2016

Hillsboro Planning

Hillsboro Planning Department
150 East Main St, Hillsboro, Oregon




## Figure 3 - Community Features

- Libraries
- Community Centers
- Proposed Community Centers
- Title 1 Elementary School
- School Sites
- Proposed Schools
- Sports Complexes
- Parks

N

0 2,500 5,000 Feet

Data Source: City of Hillsboro 2016 | Plot Date: October 4, 2016

Hillsboro Planning

Hillsboro Planning Department
150 East Main St, Hillsboro, Oregon

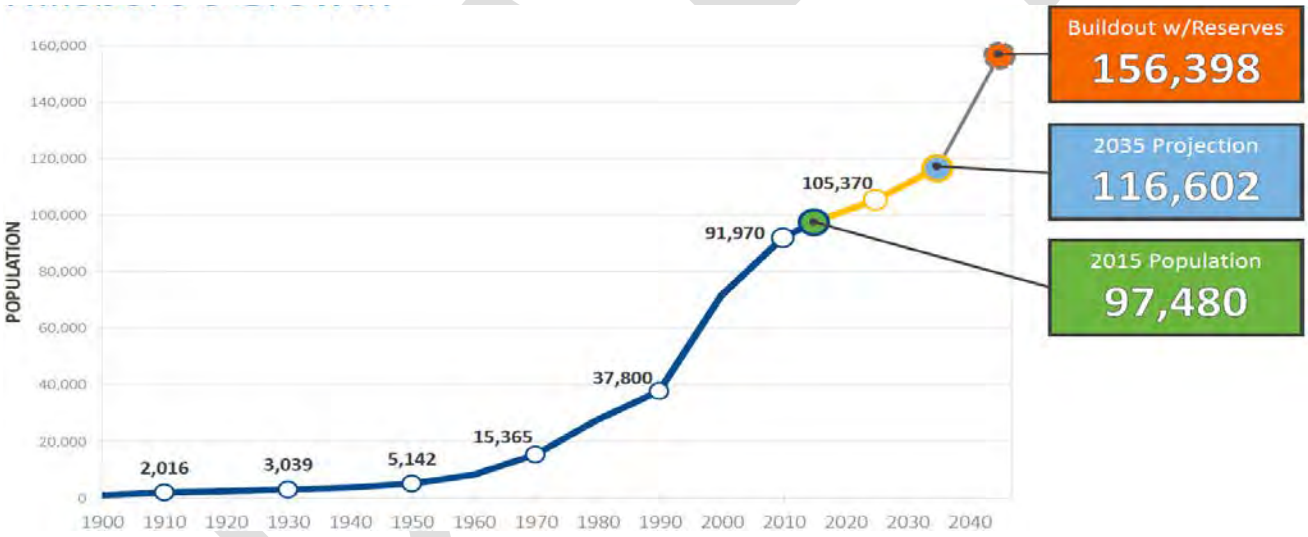
## 2.2. Population and Employment

Hillsboro has experienced many changes that have affected transportation system needs since the current TSP was updated in 2004, such as high rates of growth in population and jobs compared to the state averages. Because Hillsboro features a desirable location, a robust supply of available employment land, and local and state programs favorable to employment, the City anticipates a 20 percent increase in population and 31 percent increase in jobs by 2035.[1]

### 2.2.1. Population Growth

The State of Oregon estimates that, by 2050, Washington County will be nearly as populous as Multnomah County, with each county exceeding 900,000 residents—far surpassing the population of any other county in the state.[2] Hillsboro had a population of 37,800 in 1990. The Census reported a population of 91,970 in 2010, and a population projection of 116,602 for year 2035. Figure 4 illustrates the historic growth and future projection for Hillsboro's population.

**Figure 4. Hillsboro Historic Population and Projections**




Understanding the overall population and employment density helps identify areas where targeted transportation system improvements would be most beneficial. For example, higher density areas would be desirable for transit, and areas with a high population of seniors and youth would benefit from improved multi-modal connectivity.

Figure 5 illustrates the overall population density within the City of Hillsboro. Overall, the majority of current population in the City resides in the area between Baseline Street/Main Street and TV Highway.

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[1]Metro. (2012). *'Gamma' Forecast*. Population estimates based on household projections multiplied by 2.6 persons per household. This estimate assumes that all current Urban Reserves are available for development. Retrieved from http://www.oregonmetro.gov/sites/default/files/metro_gamma_forecast_distribution_city_county_profiles_111512.pdf.

[2]Oregon Office of Economic Analysis. (2013, March). *Oregon's Long Term County Population Forecast 2010-2050*. Retrieved from http://www.oregon.gov/das/OEA/Documents/County_forecast_March_2013.xls.

However, the areas of highest population (20–50 persons/acre) can be found in three distinct areas: the eastern side of Downtown, South of Intel Jones Farm campus, and areas adjacent to the Tanasbourne retail development.

### 2.2.2. Employment Growth

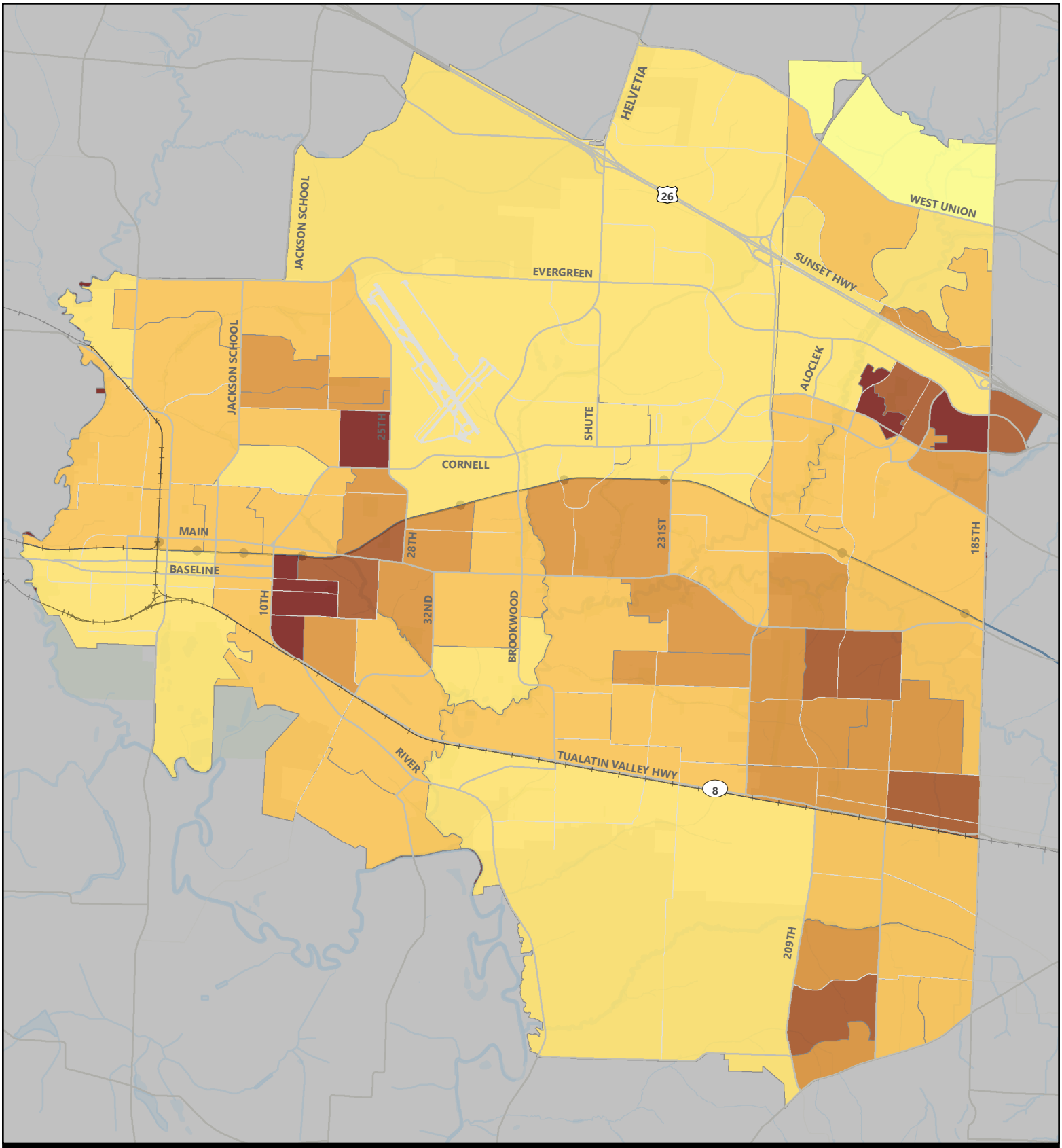
Location of employment centers is also important for identifying transportation improvements. Over the past few decades, the economies of Hillsboro and neighboring jurisdictions have transitioned from primarily farming- and agriculture-focused to high-tech research, development, and manufacturing. The City is home to numerous companies specializing in the design and manufacture of products such as computer chips, semiconductors, and solar panels. The rise of this so-called "Silicon Forest" has had a dramatic impact on the City's economy, community composition, and infrastructure needs. Other major employers include those specializing in film production, food products, and sportswear and outdoor apparel. In addition, thousands of employees fill entry-level customer service jobs at call centers and retail and service establishments.

The majority of jobs in Hillsboro are located in North Hillsboro, around Downtown, and in the AmberGlen/Tanasbourne area. As shown in the Figure 6, while employment are scattered throughout the City, a significant concentration of employment can be found around Downtown, North Hillsboro, and the AmberGlen/Tanasbourne area.

### 2.2.3. Housing Needs

The continued growth in employment opportunities in Hillsboro has contributed to the increased influx of new residents to the area in recent years. HIllsboro has responded to increased demand for housing by facilitating the recent development of neighborhoods such as Orenco Station, Witch Hazel, and Tanasbourne. These communities vary in terms of housing types, densities, and neighborhood character. With only 14 percent of the City's remaining projected 20-year buildable land supply located within city limits,[3] the City must look for additional options to accommodate the growing demand for housing. Newly-expanded UGB areas such as South Hillsboro and Urban Reserves lands such as Bendemeer and Witch Hazel Village South will be valuable for accommodating future residential growth.

[3] EcoNorthwest. (2016). *Housing Needs Analysis*. Hillsboro, OR.




# Figure 5 - Population Density

Persons / Acre

0 | 1 - 5 | 6 - 10 | 11 - 15 | 16 - 20 | 20+

N

0 2,500 5,000 Feet

Data Source: 2010-2014 ACS 5-Year Estimates B01003 Total Population; by Census Block Group | Plot Date: October 04, 2016

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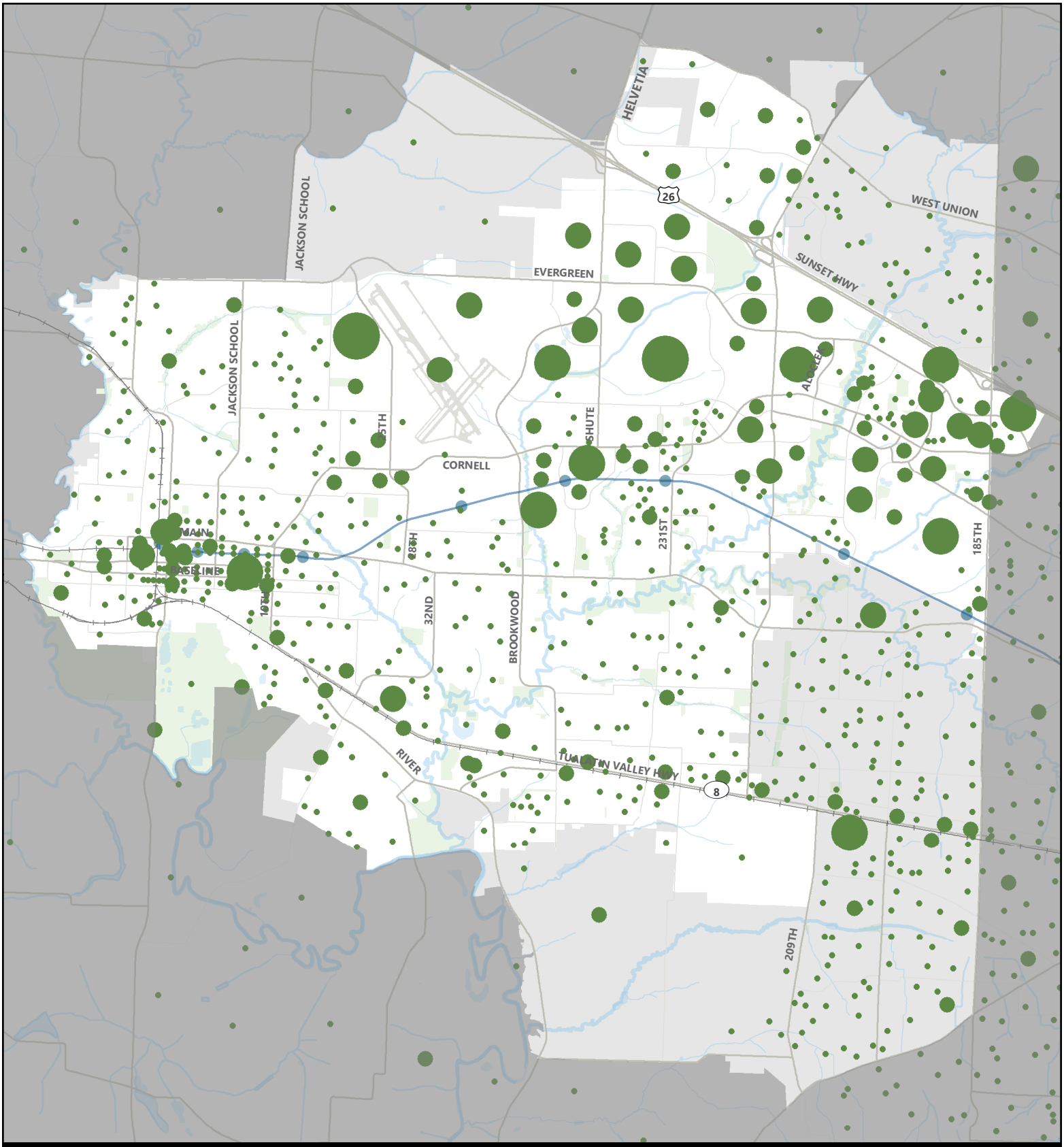


## Figure 6 - Employment Density

**Employee Population**

- 0 - 99
- 100 - 499
- 500 - 999
- 1,000 - 3,999
- More than 4,000

N

0 2,500 5,000 Feet

Data Source: LEHD On The Map 2016 | Plot Date: October 04, 2016

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## 2.3. Commute Patterns

Employment in Hillsboro draws workers from a broad geographical area from throughout the Portland region while, at the same time, Hillsboro residents commute to various locations across the region for work. In 2014, there were 41,821 working Hillsboro residents and 66,585 jobs in Hillsboro. Of these, approximately 15,000 to 16,000 residents resided and worked in the City Hillsboro.

Roughly 80 percent of the Hillsboro workforce live within 25 miles of their jobs. Having such a large movement of workers and residents in and out of the city on a daily basis increases demand on the transportation network, and emphasizes the importance of a well-functioning regional system for workers and residents alike.

### 2.3.1. Commute Flow

As shown in Figure 7, Hillsboro businesses drew about 24% of their workers from within Hillsboro in 2014; while the majority of the rest came from southeastern Washington County (Beaverton, Tigard, and Tualatin), Bethany, Cedar Mill, Rock Creek, and Portland's close-in neighborhoods. A smaller percentage commuted to jobs in Hillsboro from areas such as Forest Grove, Cornelius, Salem, Newberg, etc.

As illustrated in Figure 8, about 35% of employed Hillsboro residents also had jobs in Hillsboro in 2014; while the rest primarily commuted to Portland and areas in southeastern Washington County such as Beaverton, Tigard, and Tualatin for work. A smaller percentage commuted to areas south (Salem, Eugene, Newberg) and west (Forest Grove, Cornelius) of the City.

### 2.3.2. Mode Choice

According to the US Census, in 2014, 75% of employed Hillsboro residents chose driving alone as the primary choice of transportation mode to work, compared to 78% in the US and 71% in the metro Portland region. In addition, 10% of Hillsboro residents commuted by carpool, 7% transit, 1% bicycle, 3% walking, and 4% worked from home; this is compared to the US average of 9% carpool, 5% transit, 1% bicycle, 3% walking, and 4% work from home; and metro Portland region's 9% carpool, 7% transit, 3% bike, 4% walking, and 6% work from home. Hillsboro workers' commute mode choice is summarized in Figure 9.

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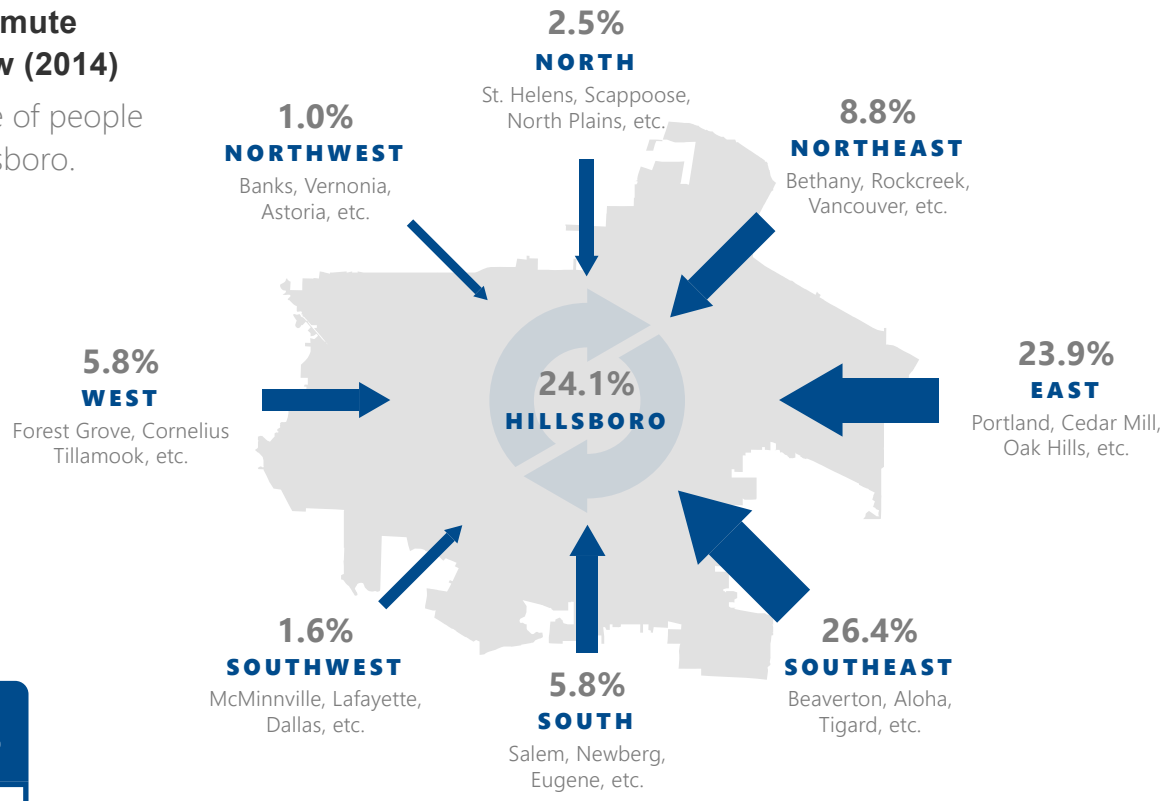
**Figure 7 - Commute Patterns, Inflow (2014)**

Commute source of people employed in Hillsboro.

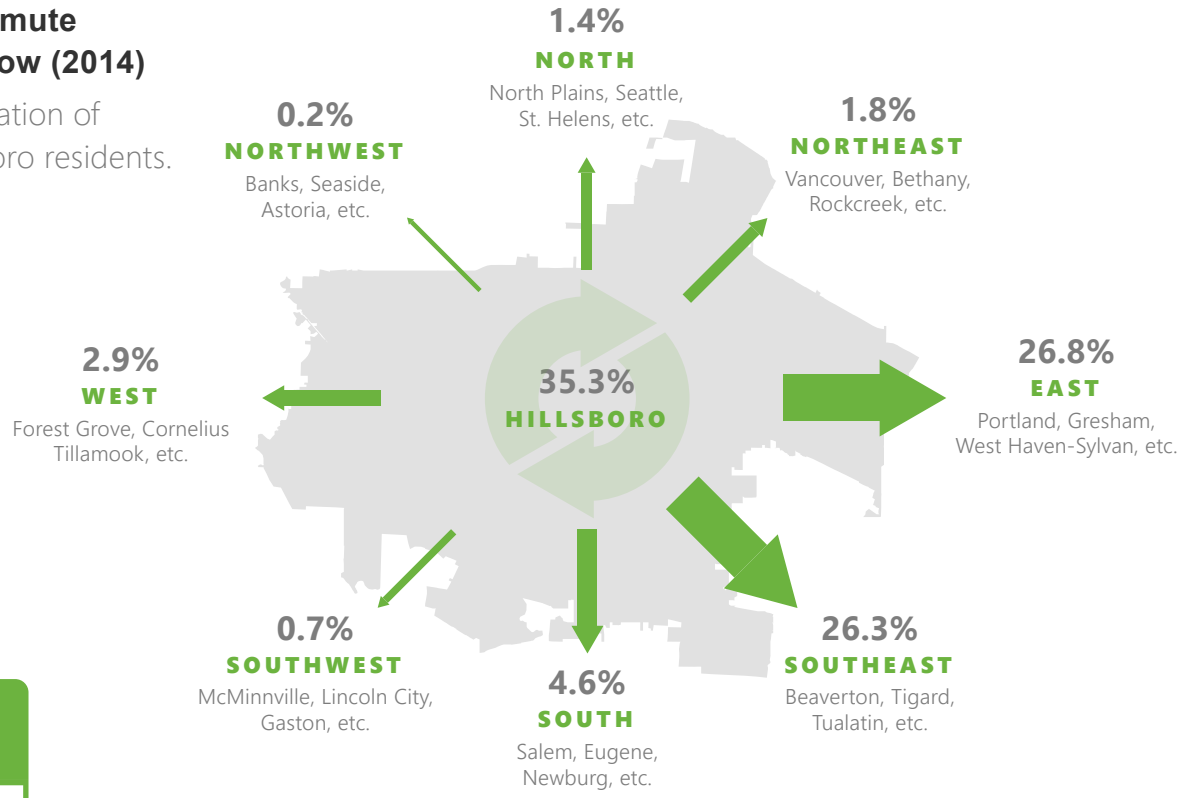



**66,585**
**JOBS IN HILLSBORO**

Source: 2014 LEHD Origin-Destination Employment Statistics (via OnTheMap)

**Figure 8 - Commute Patterns, Outflow (2014)**

Commute destination of employed Hillsboro residents.

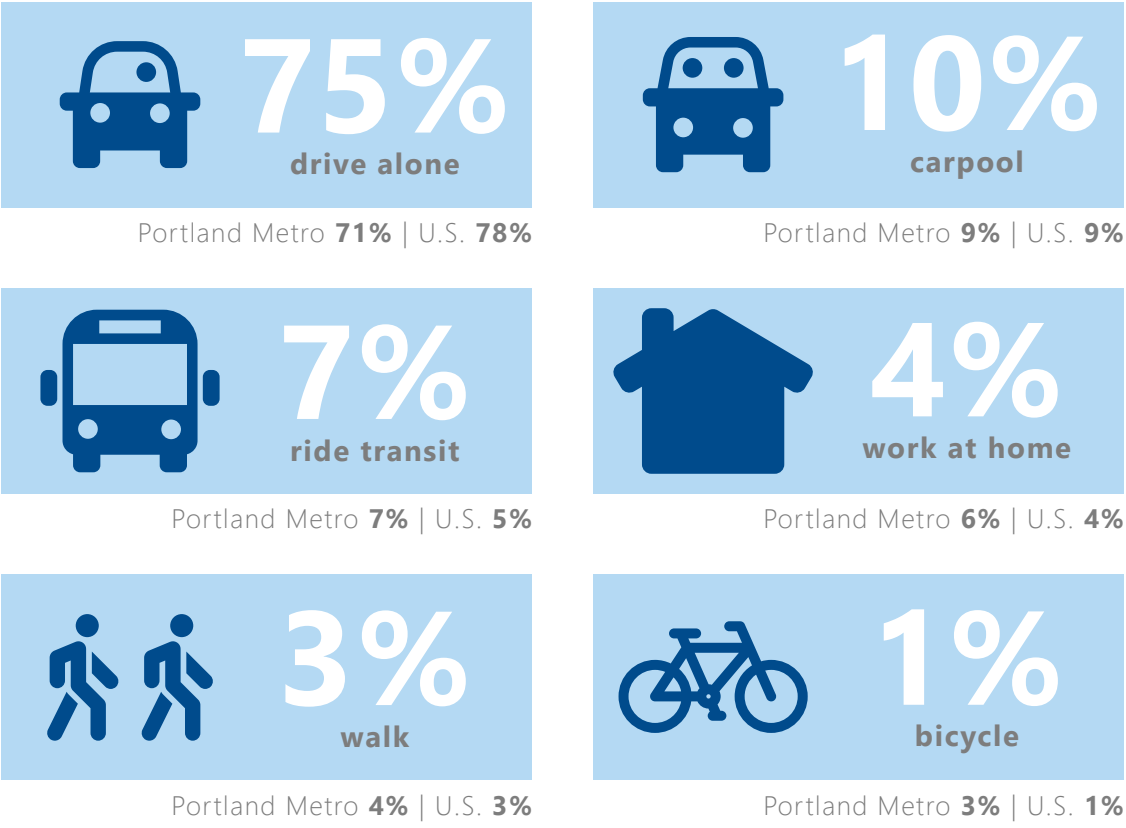



**41,821**
**EMPLOYED RESIDENTS**

Source: 2014 LEHD Origin-Destination Employment Statistics (via OnTheMap)

## Figure 9 - Commute Mode

How Hillsboro residents get to work.




Source: 2014 American Community Survey (5-Year Estimates), Table S0801

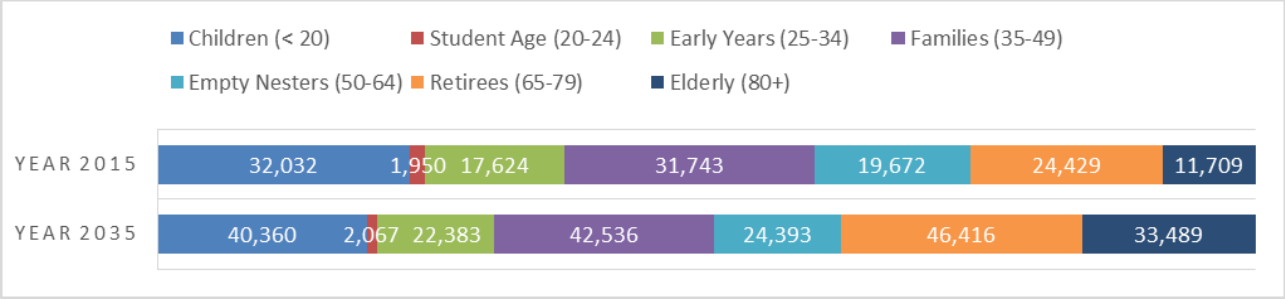
## 2.4. Demographics

A community's transportation system should provide efficient and accessible options that serves the daily needs of all its citizens. To achieve this goal, it is important to understand the demographics pattern in the City—particularly where groups that might be more reliant on non-auto transportation modes reside, and where they travel to and from for their daily needs. In developing strategies and planning future investments, the City wants to ensure access for all community members and minimize impacts to its disadvantaged communities.[4]

### 2.4.1. Age Composition

Figure 10 shows the age composition of Washington County in 2015 and what is projected for year 2035. It is worth noting that persons age 65 or older are expected to account for 38 percent of the total population in 2035, compared to 26 percent today.[5] As the population grows older, meeting the transportation needs of seniors will remain an important issue. Expanding transportation options, retrofitting existing infrastructure to be more suitable for older users, and facilitating development of compact neighborhoods with pedestrian access to retail, services, and public transportation can all contribute to seniors' transportation independence.

**Figure 10. Age Composition of Washington County – Current (2015) and Future (2035)**




*Source:* (Oregon Office of Economic Analysis, 2016)

### 2.4.2. Diversity

Comparing to Washington County and the Portland region, Hillsboro's population is more ethnically diverse.[6] In 2013, about 40 percent of Hillsboro's population was non-white. The largest ethnic and racial minority groups were Hispanic (24.3 percent) and Asians (8.7 percent). The Hispanic population grew from 19 percent of Hillsboro's population in 2000 to about 24 percent of the population in 2013, adding more than 10,000 new Hispanic residents to the City's population during that time.

Figure 11 provides a breakdown of the population by ethnicity in Hillsboro. As mentioned above, Hispanic and Asian populations make up the majority of the racial minorities in Hillsboro, with populations concentrated near downtown Hillsboro and in areas near Tanasbourne and AmberGlen.

[4] In alignment with Executive Order (EO) 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations.
[5] Oregon Office of Economic Analysis. (2013, March). *Oregon's Long Term County Population Forecast 2010-2050*. Retrieved from http://www.oregon.gov/das/OEA/Documents/County_forecast_March_2013.xls.
[6] EcoNorthwest. (2016). *Housing Needs Analysis*. Hillsboro, OR.

### 2.4.3. Populations Dependent on Alternative Modes of Transportation

The elderly (residents over 65 years old), youths (residents under 18 years old), and persons with disabilities are more likely to be dependent on walking, bicycling, or public transit for transportation. It is important to identify areas with high percentages of seniors and youth, so that transit, pedestrian, and cycling improvements that preserve and enhance accessibility for these residents can be prioritized in these areas. Figure 12 shows the density of transportation-disadvantaged populations in Hillsboro by block groups in 2010.

Downtown Hillsboro and the area south of Intel Jones Farm campus have the highest proportion of residents under 18. The area near Tanasbourne has the highest proportion of elderly residents. There are smaller pockets of these populations speckled throughout the City.

Hillsboro's population is growing older as the baby boomer generation ages. Although the City has on average a smaller share of people over 40 years old than the region, Hillsboro's population is growing older, consistent with state and national trends.[7] The impact of growth in the population of seniors in the City will depend in part on whether seniors continue to live in Hillsboro as they retire. Growth in the population over 60 years old since 2000 suggests that some (and perhaps many) of the residents that retire will continue to live in Hillsboro after retirement. National surveys show that, in general, most retirees prefer to age in place by continuing to live in their current home and community as long as possible.[8] This trend is strongly reflected in the *Hillsboro 2035 Community Plan*, which includes as a major initiative the facilitation of aging in place for seniors.

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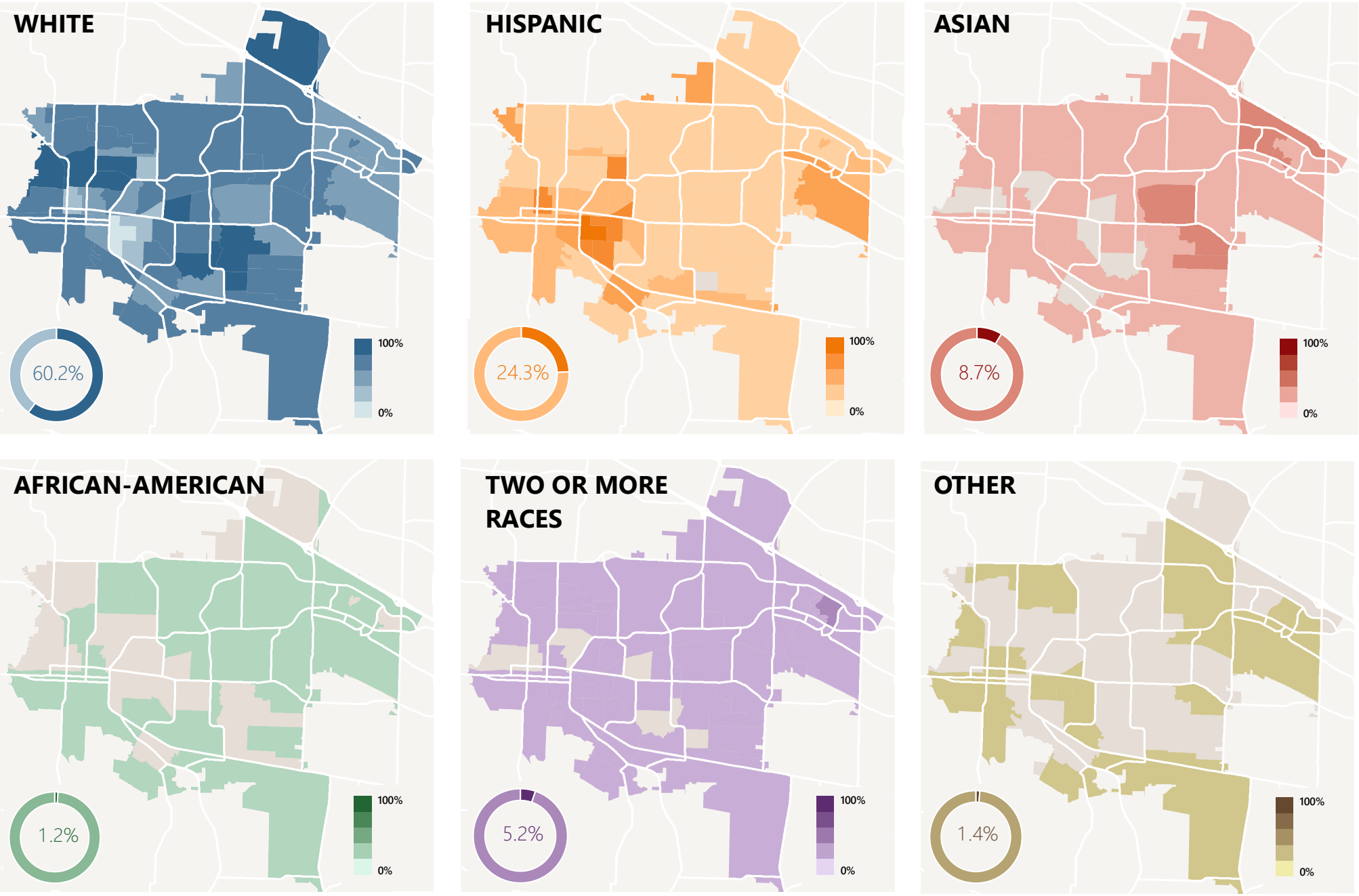
[7] Ibid. p. 44.

[8] A survey conducted by the AARP indicates that 90 percent of people 50 years and older want to stay in their current home and community as they age. See http://www.aarp.org/research.




## Figure 11 - Ethnicity

Maps are ordered according to their relative density of that race in Hillsboro. Unless otherwise noted, these maps illustrate the listed race alone. Individuals reporting two or more races together are included in the appropriately-titled figure.

N

0 1.5 3 Miles

Data Source: US Census Bureau, 2010-2014 ACS 5-Year Estimates. Hispanic or Latino Origin by Race (B03002). Census Block Groups. | Plot Date: Octoboer 04, 2016

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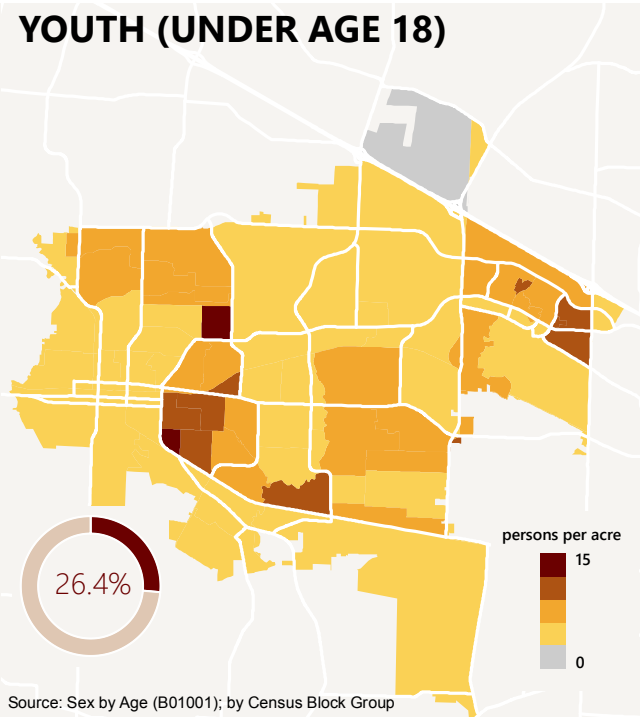
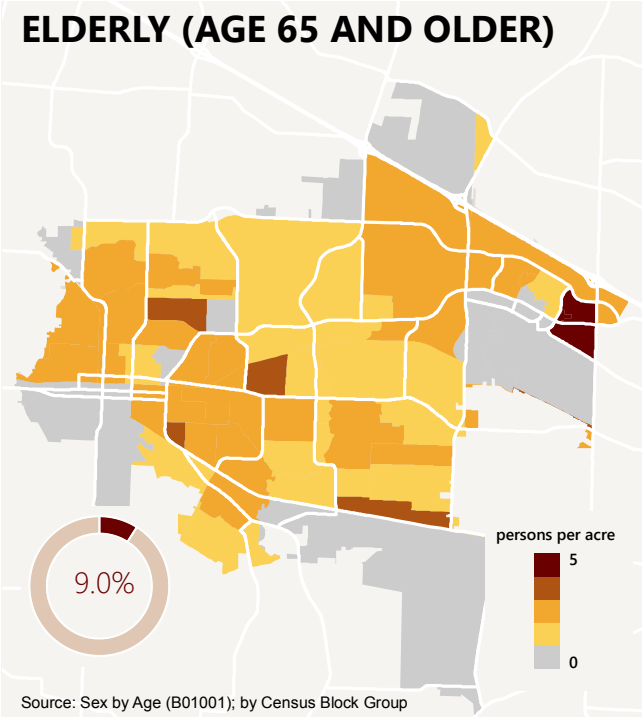
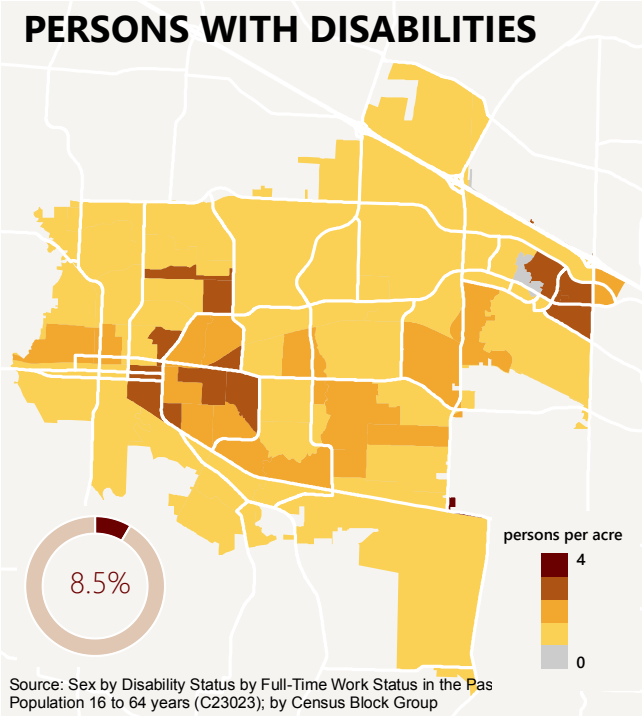
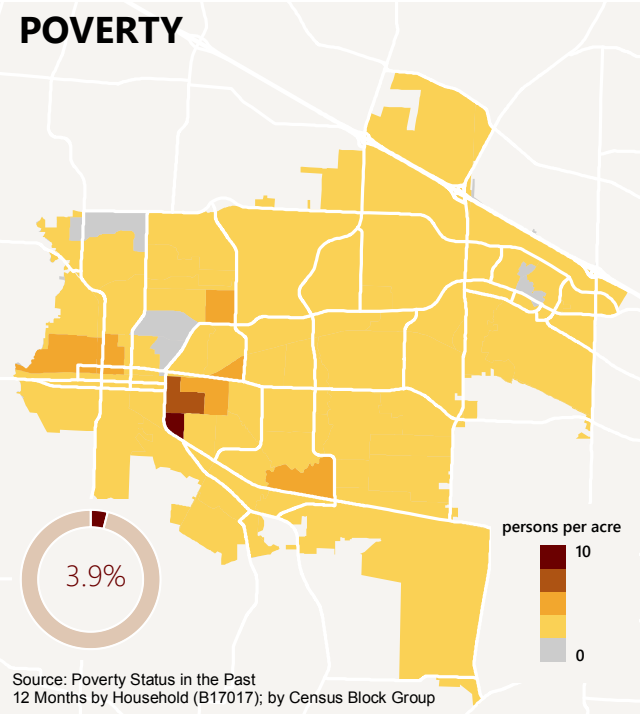
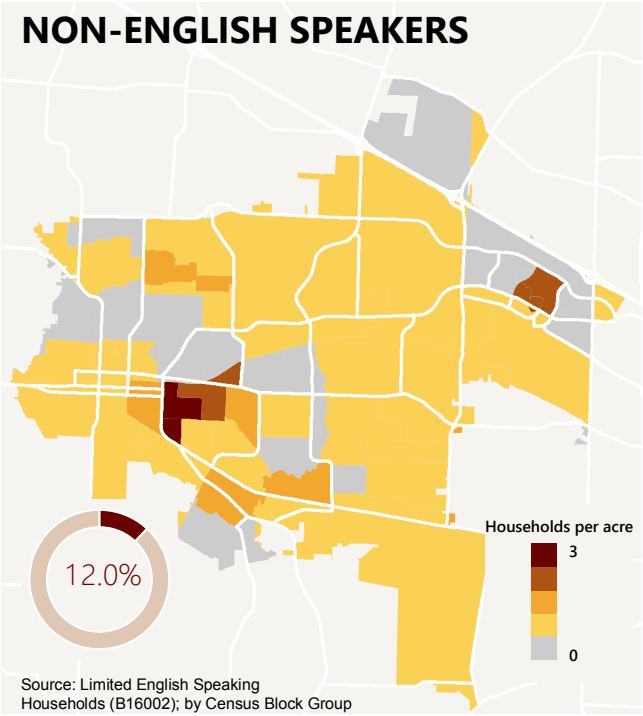
# Figure 12 - Transportation Disadvantaged Populations

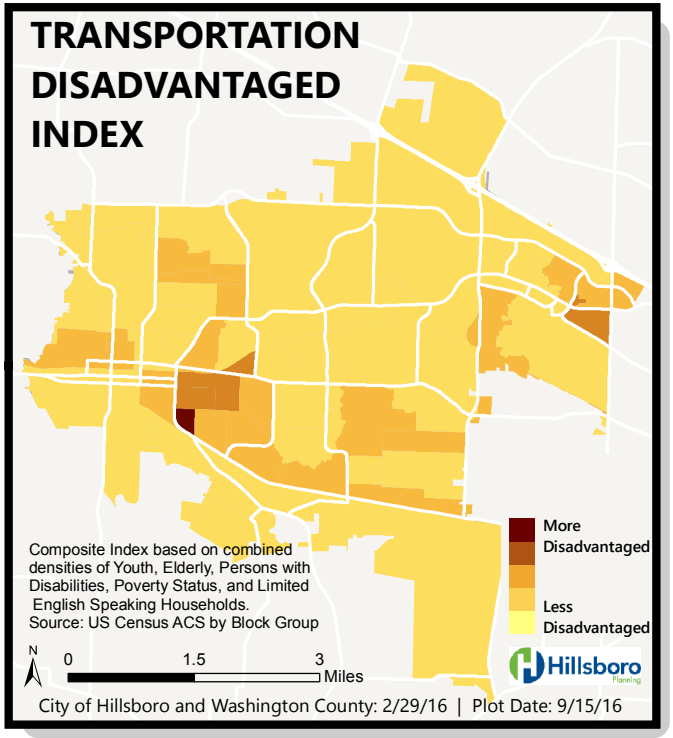


## 2.5. Key Land Use and Population Takeaways

The rapid growth of the past few decades has highlighted several transportation challenges related to land use and population:

- Hillsboro has a diverse mix of land use, providing housing, employment, commercial, and recreation in the City
- Only about 24 percent of Hillsboro jobs are filled by Hillsboro residents; similarly, only about 35 percent of Hillsboro residents work in Hillsboro. This underscores the significance of regional transportation needs.
- Hillsboro's commute mode choice is on par with national and regional average, with about 75 percent of commuters choosing to drive alone
- Hillsboro has a large and fast growing share of racial minorities compared to the region
- Washington County's over-65 population is projected to increase from 26 percent today to 38 percent in 2035

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# 3. Transportation System Inventory

This section documents the inventory of the existing transportation system, including the roadway, pedestrian, and bicyclist network, as well as current transit services, in Hillsboro.

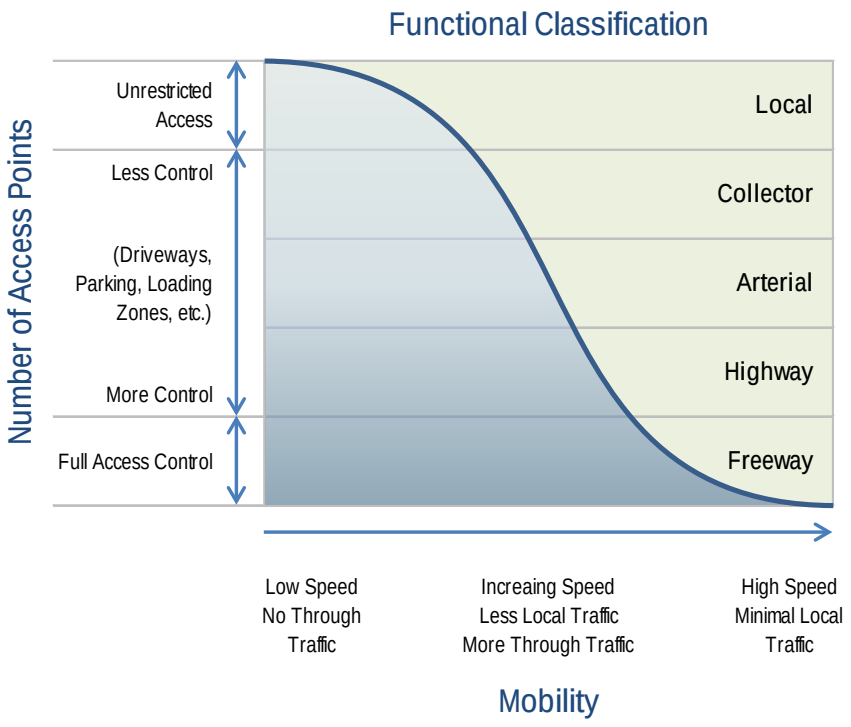
## 3.1. Street and Highway System

There are three state highways serving the City of Hillsboro as well as a network of arterial and collector streets maintained by the City and Washington County. This section describes the current system for vehicular travel within the study area. The inventory includes a summary of the available facilities, as well as jurisdiction, roadway characteristics, and important uses.

### 3.1.1. Functional Classification

Streets and highways are assigned a classification to indicate their purpose, design, and function. This functional classification ensures that streets are built and maintained with features that can support demand from both the surrounding land uses and from traffic that may be traveling through parts of the city. It also describes how adjacent properties are accessed and how much mobility the street provides, as illustrated below in Figure 13.

**Figure 13. Functional Classifications Hierarchy**



The functional classification system for the Hillsboro street network is illustrated in Figure 14. The most recent TSP update (2004) summarizes the functional classifications based upon connectivity. The functional classifications are:

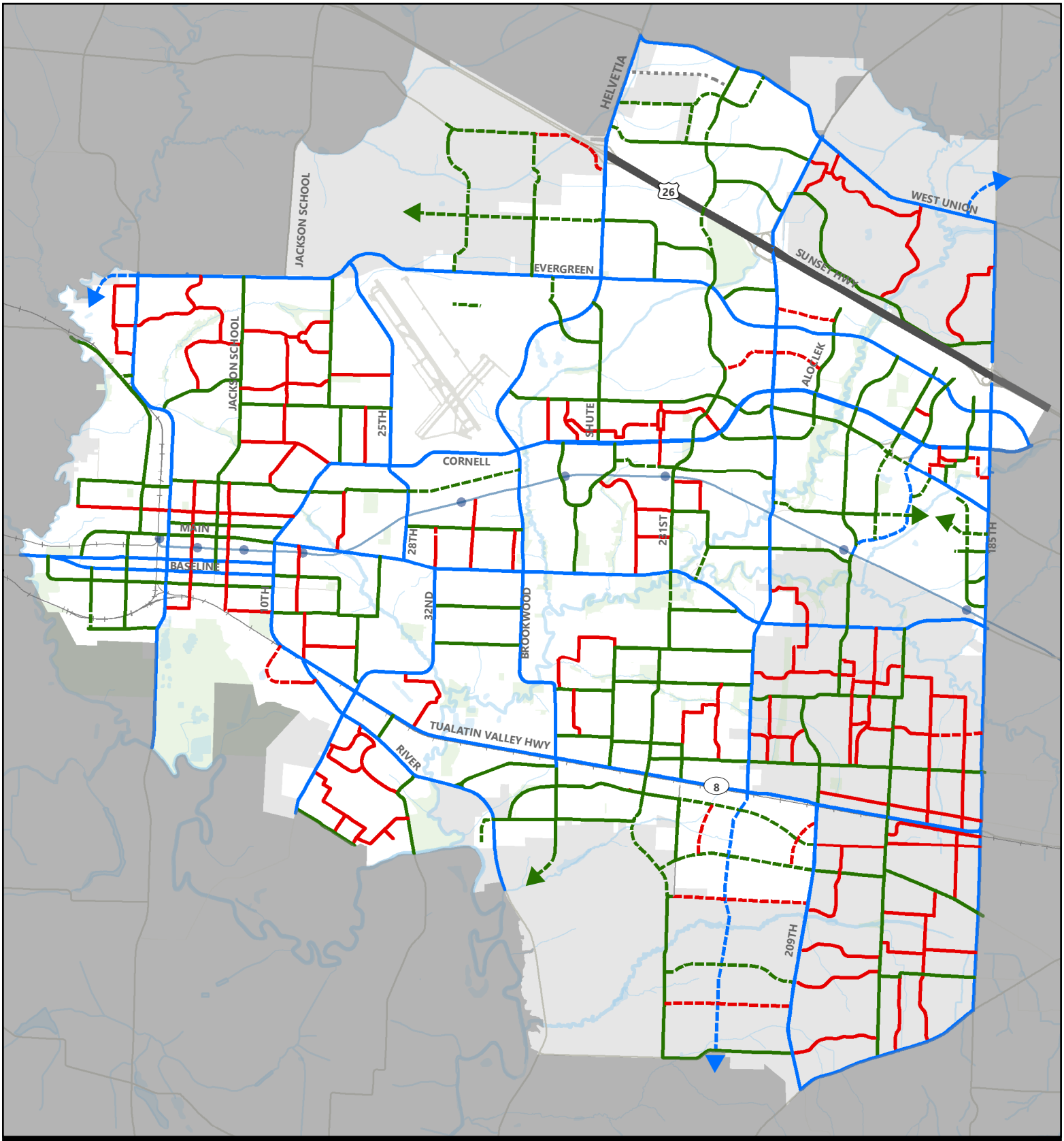
- **Arterial Streets** link major commercial, residential, industrial, and institutional areas. Arterial streets are typically spaced about one mile apart to ensure accessibility and reduce the incidence of traffic using collectors or local streets rather than a well-placed arterial street. Many of these routes connect to cities surrounding Hillsboro.
- **Collector Streets** provide both access and circulation within residential, commercial, and industrial areas. Collectors differ from arterials in that they provide a citywide circulation function, do not require as extensive control of access as arterials, and penetrate residential neighborhoods, distributing trips from the neighborhood and local street system.
- **Neighborhood Routes** provide connectivity to collectors or arterials. Because neighborhood routes have greater connectivity than local streets, they generally have more traffic and are used by residents in the area to get out of the neighborhood, but they do not serve citywide or large area circulation. Traffic from cul-de-sacs and other local streets may connect via neighborhood routes to gain access to collectors or arterials.
- **Local Streets** provide access to adjacent land and, through their design, deliberately discourage through traffic.

### 3.1.2. System Completeness

The Metro Regional Transportation Functional Plan (RTFP) recommends that TSPs illustrate, to the extent practicable, a network of major arterial streets at 1-mile spacing and minor arterials or collectors at ½-mile spacing[9]. Figure 15 shows the arterial and collector network with ½-mile and ¼-mile buffers, respectively, thus illustrating that the arterial and collector network in Hillsboro generally meet the Metro RTFP spacing recommendations. Areas where the existing network fall short are typically large campus locations the Hillsboro Airport, Intel Ronler Acres campus, OHSU, or natural barriers such as creeks.

Beyond the arterial and collector network, however, the City has a disjointed and often disconnected network of neighborhood routes and local streets. This pattern is typical of suburban communities developed in the mid- to late-20th century as the automobile became the primary mode of transportation and environmental regulations limited the ability to create crossings across creeks and streams. The lack of connectivity in the neighborhood routes and local streets creates an increased burden on the arterial and collector system.

[9] The Regional Transportation Functional Plan, Title 1, Street System Design Sec. 3.08.110C, Metro, 2012.




## Figure 14 - Functional Classification

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

N

0 2,500 5,000 Feet

Data Source: City of Hillsboro 2016 | Plot Date: October 05, 2016

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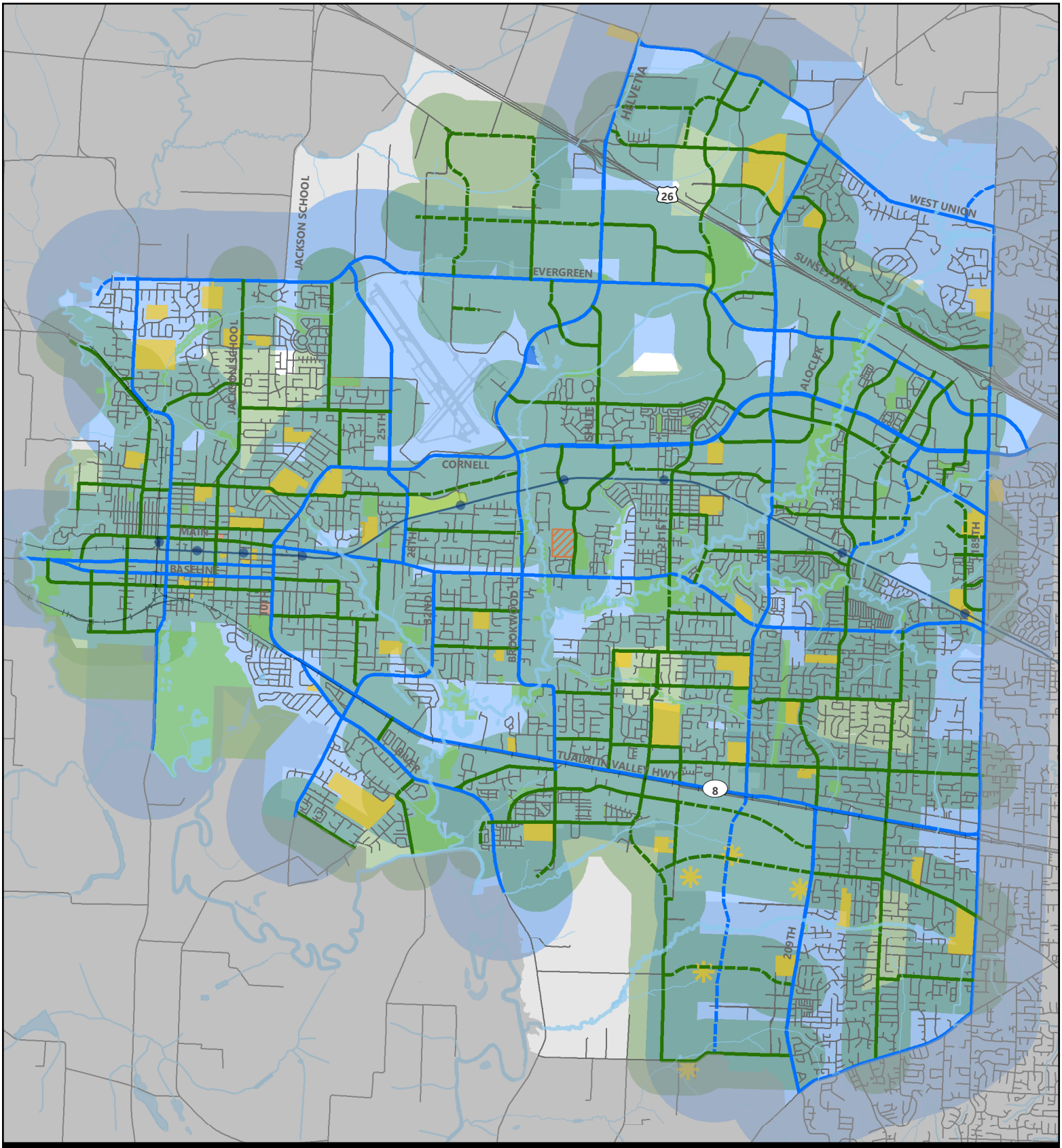


## Figure 15 - System Completeness

- Arterial
- Collector
- Within 1/2 mile of an Arterial
- Within 1/4 mile of a Collector
- Parks
- Libraries
- Community Centers
- School Sites

N

0 2,500 5,000 Feet

Data Source: City of Hillsboro 2016 | Plot Date: October 05, 2016

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The Metro RTFP acknowledges that existing developments and natural features may present challenges in meeting the street spacing standards that contribute to transportation system completeness. In Hillsboro, connectivity may not be practical in certain areas because of existing infrastructure or geographic constraints such as:

- Hillsboro Airport
- Existing development
- Existing infrastructure (natural gas pipeline corridors and MAX light rail)
- Parks
- Portland & Western railroad line
- Natural features (wetlands, fish passages, and topography)
- Employment campuses

These barriers to connectivity may force users of the system to make out of direction travel. Though many of these features pose legitimate barriers to construction of new connections, these constraints highlight areas where improved alternative routes or modes of transportation are needed to connect the system.

### 3.1.3. Street Jurisdiction

The City of Hillsboro, ODOT, and Washington County each has jurisdiction over certain facilities within the TSP study area. In addition, there are also a number of private streets within the city. Roadway jurisdiction determines ownership and maintenance responsibilities and indicates the agency responsible for determining functional classification, designing features, and approving construction and access permits. Figure 16 illustrates the roadway jurisdiction in the City. Most of Hillsboro's arterial streets are under Washington County or ODOT jurisdiction.

The City owns and maintains 478.2 lanes miles of roadway (226.1 centerline miles). Within the city limits, Washington County has approximately 41 centerline miles while ODOT has roughly 8.3 centerline miles. Major travel routes within Hillsboro include US 26 (Sunset Highway), OR 8 (TV Highway), Cornell Road, Cornelius Pass Road, 185th Avenue, Baseline Road, Evergreen Road, Glencoe Road/1st Avenue (OR 219), Brookwood Parkway/Helvetia Road, Walker Road, Jackson School Road, River Road, Minter Bridge Road, Cypress Street/32nd Avenue, 28th Avenue, 25th Avenue, and West Union Road.

### 3.1.4. Number of Lanes

The majority of the arterial and collector roadways in Hillsboro are between two and five lanes. Figure 17 illustrates the current number of lanes for roadways in the City of Hillsboro. Brookwood Parkway and Cornelius Pass Road are both being widened to seven lanes in 2016 and 2017.

### 3.1.5. Speed Zones

Figure 18 summarizes the current speed zones on arterials and collectors within the City. Speed zones are set by ODOT and the local jurisdiction. The majority of the collectors and arterials in Hillsboro have posted speeds between 35 mph and 45 mph.

### 3.1.6. Creek and Rail Crossings

An important aspect of a community's transportation system is recognizing the critical role that some transportation facilities, particularly bridges, play in emergency response and evacuation. Figure 19

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illustrates the locations of bridges for creek crossings in the study area, as well as public and private rail crossings of railroad facilities. Cornell Road, Brookwood Parkway, Cornelius Pass Road, and 185th Avenue are identified as regional emergency transportation routes.[10] Each of these routes has a creek crossing, located mostly in the southeast region of Hillsboro.

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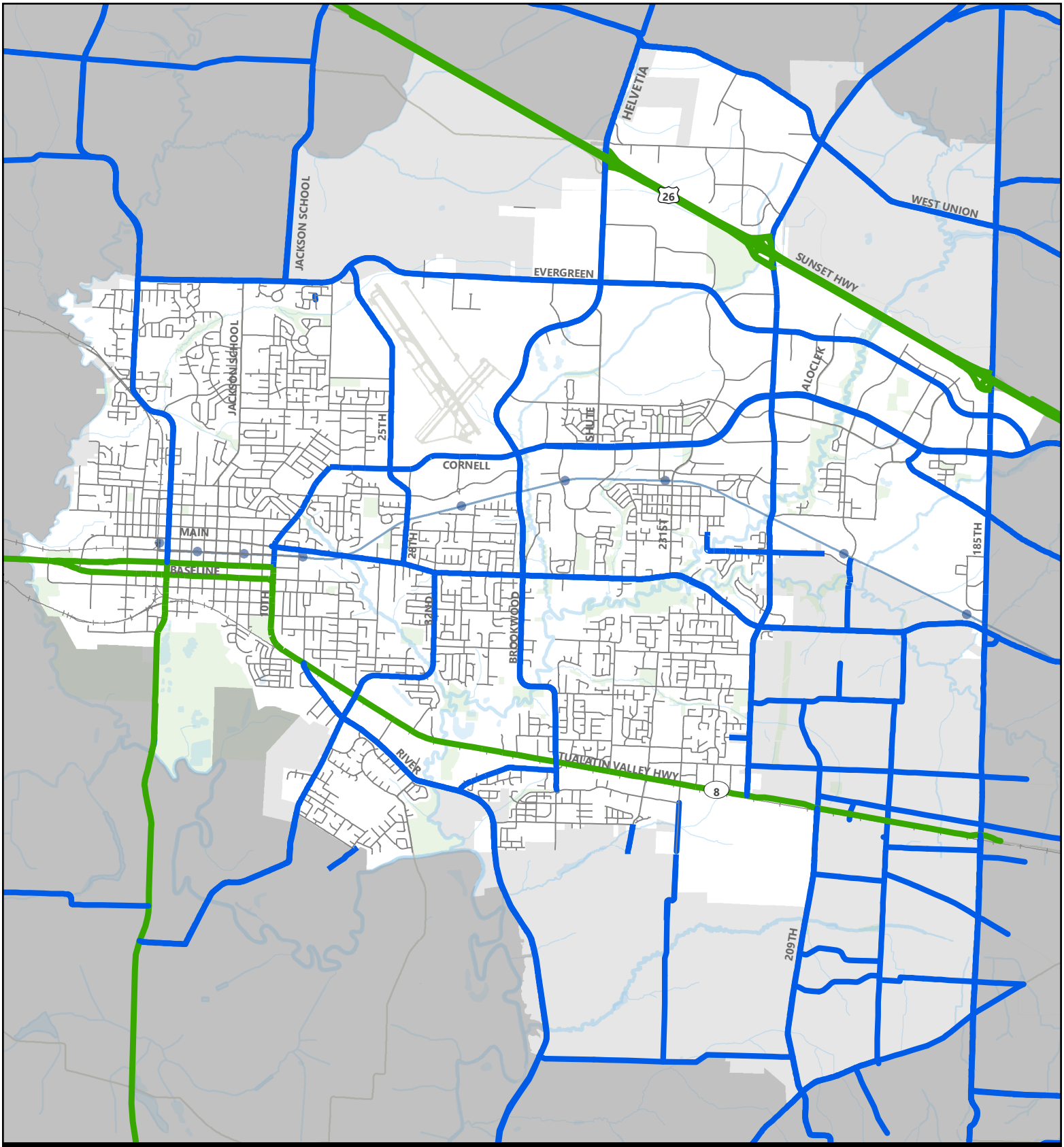
[10] http://www.ocem.org/Plans/21273-ETR%20MASTER-ODOT-FNL-cln-13jul05.pdf




## Figure 16 - Roadway Jurisdictions

City of Hillsboro

Washington County

ODOT

N

0 2,500 5,000 Feet

City of Hillsboro: March 17, 2016 | Washington County: March 1, 2016 | Plot Date: October 05, 2016

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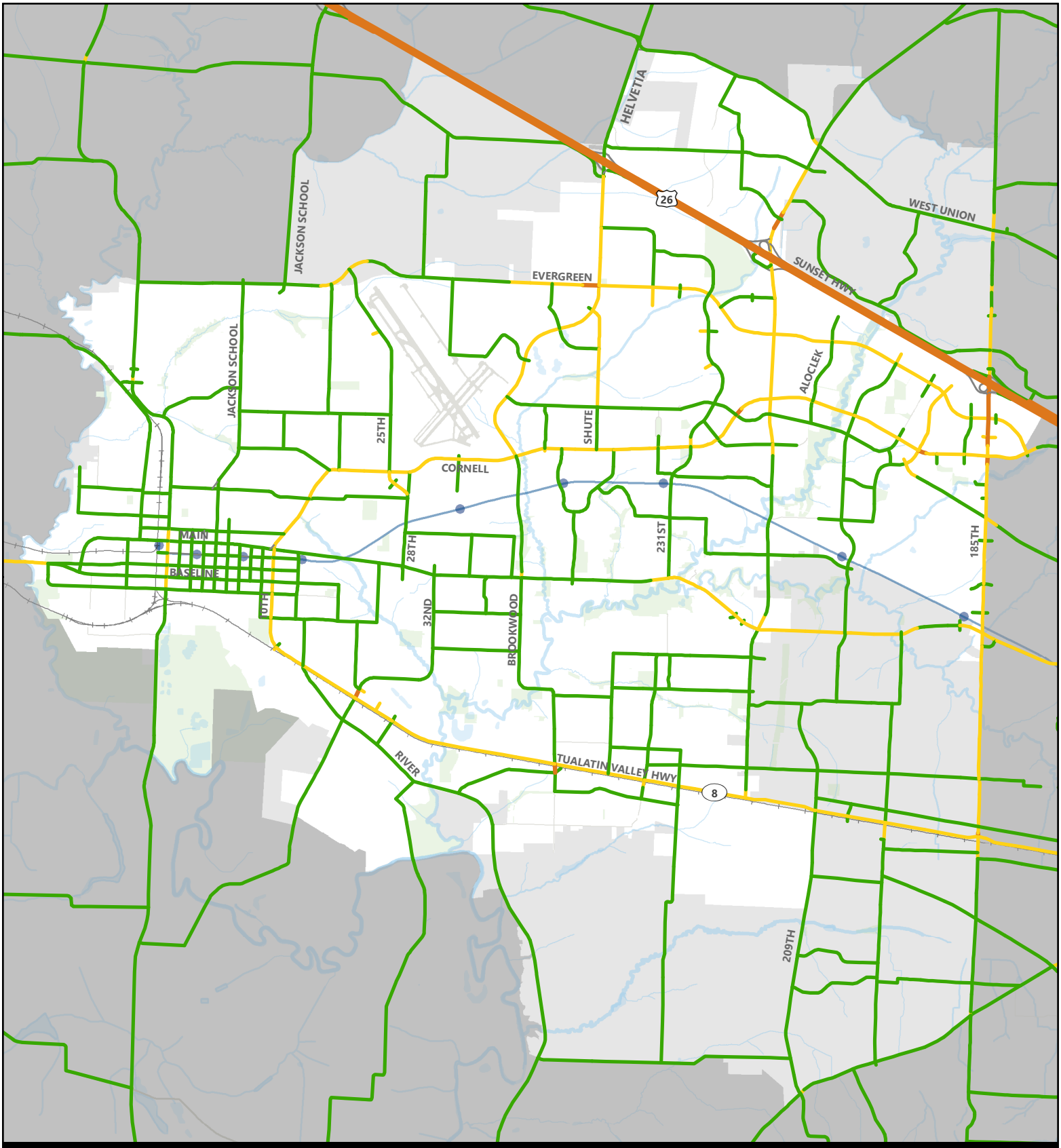



## Figure 17 - Number of Lanes

- 6 - 7 lanes
- 4 - 5 lanes
- 2 - 3 lanes
- 1 lane

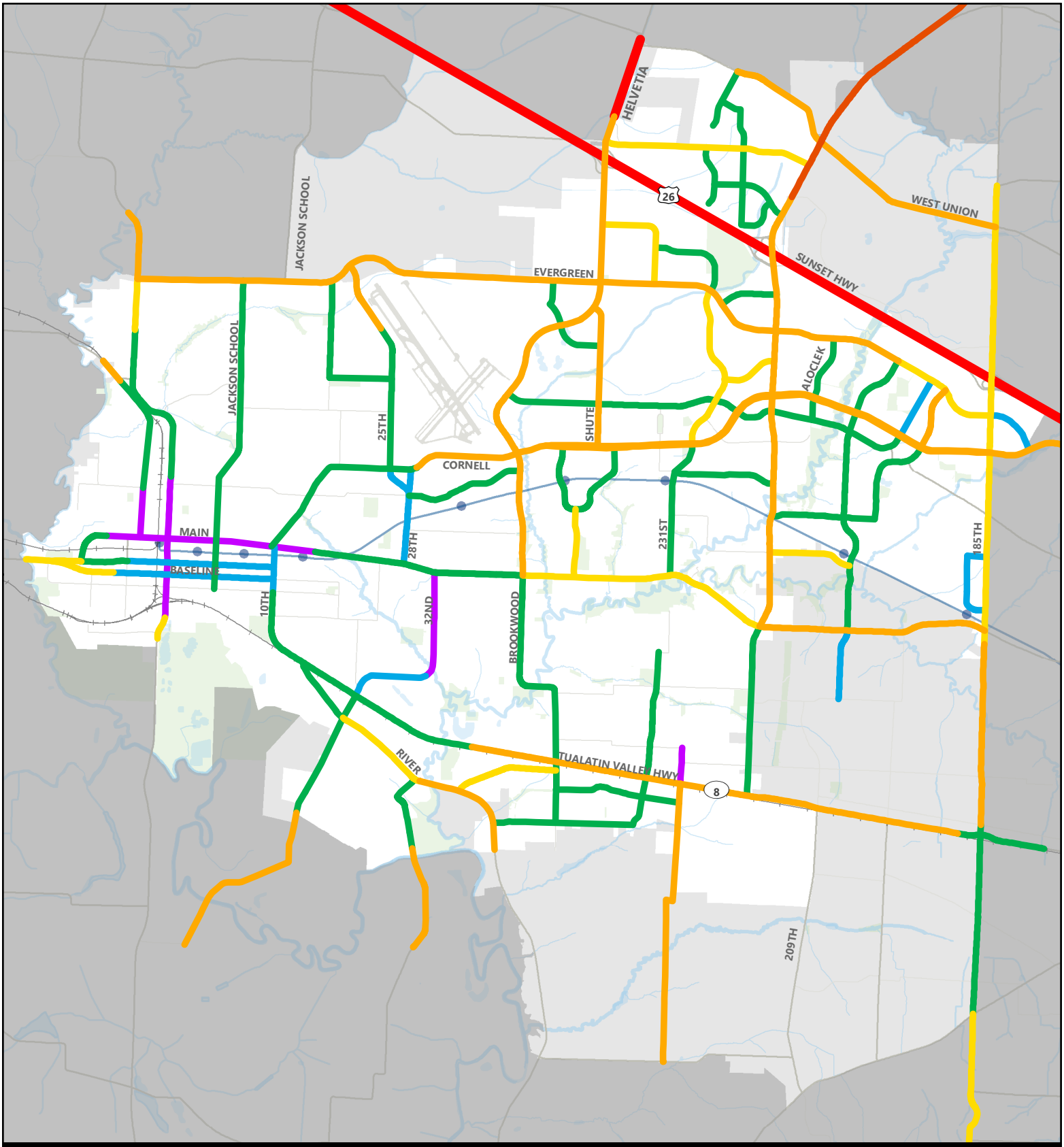
N

0 2,500 5,000 Feet

Data Source: City of Hillsboro 2016 | Plot Date: October 05, 2016

Hillsboro Planning

Hillsboro Planning Department
150 East Main St, Hillsboro, Oregon




## Figure 18 - Speed Zones

- 25 MPH
- 30 MPH
- 35 MPH
- 40 MPH
- 45 MPH
- 50 MPH
- 55 MPH

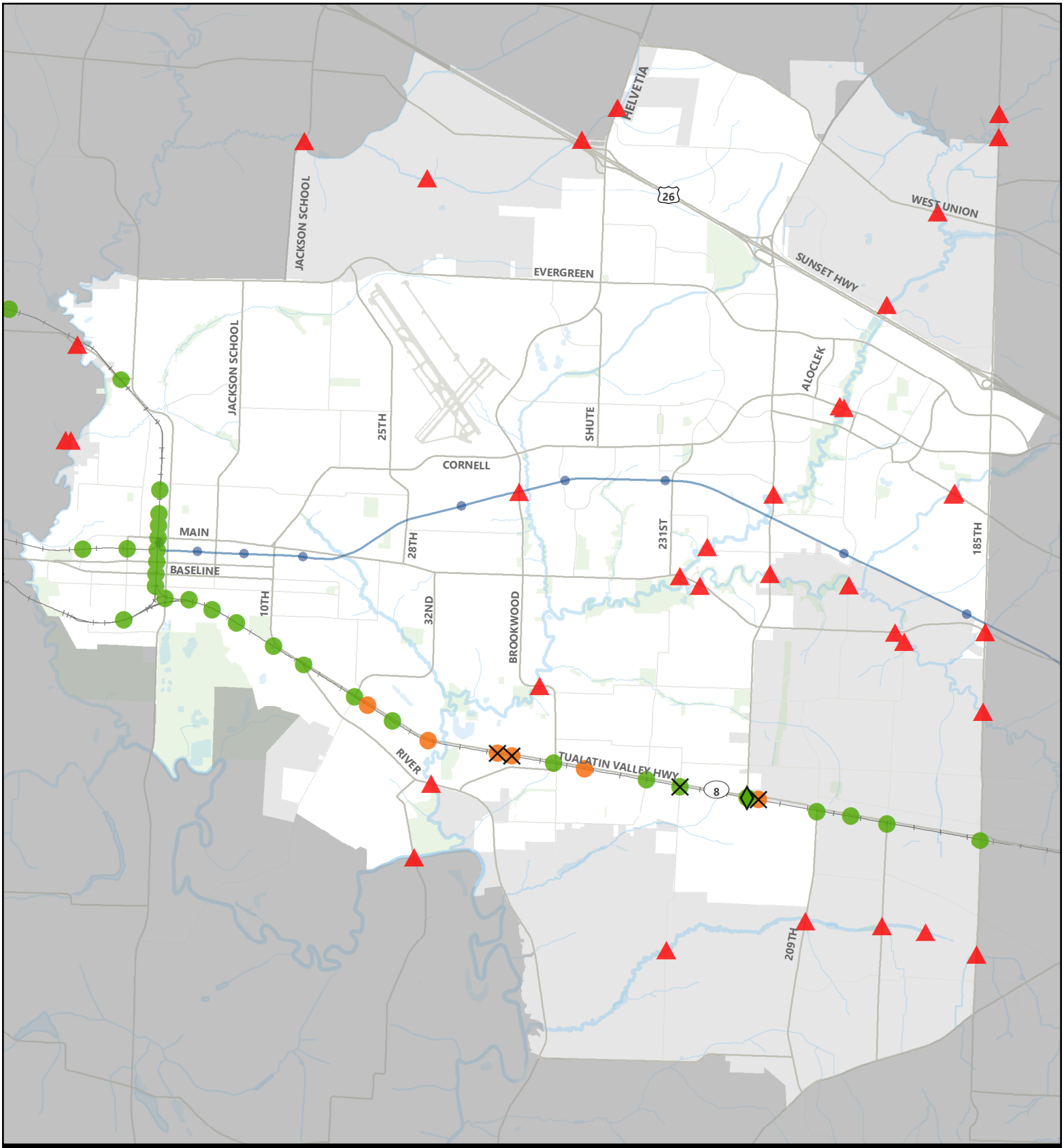
N

0 2,500 5,000 Feet

Data Source: City of Hillsboro 2016 | Plot Date: September 15, 2016

Hillsboro Planning

Hillsboro Planning Department
150 East Main St, Hillsboro, Oregon




# Figure 19 - Creek and Rail Crossings

- Crossing to be Closed
- Proposed Crossing
- Creek Crossing
- Public Rail Crossing
- Private Rail Crossing

N

0 2,500 5,000 Feet

Data Source: City of Hillsboro 2016 | Plot Date: September 15, 2016

Hillsboro Planning

Hillsboro Planning Department
150 East Main St, Hillsboro, Oregon

## 3.2. Transit System

TriMet is the Portland region's transit service provider. There are currently seven bus routes and a light rail line in the City of Hillsboro. Additionally, there is a peak-hour commuter shuttle service provided by Ride Connection to serve the North Hillsboro employment area.

### 3.2.1. Existing Service

An analysis of transit boarding and alighting data from the fall of 2015 TriMet Passenger Census revealed that the most travelled bus routes in Hillsboro are route 57, route 52, and route 48. The TriMet MAX Blue Line had the highest of all transit ridership in Hillsboro. Table 1 summarizes the service, frequency, weekday ridership of each transit route in Hillsboro. Figure 20 illustrates the transit lines serving Hillsboro.

**Table 1. Existing Transit Service and Ridership Data**

| Route | Frequency | Average Weekday Ridership* |
|---|---|---|
| **46 – North Hillsboro** | Weekday service approximately hourly between 6:00 a.m. and 7:00 p.m. No weekend service. | 427 |
| **47 – Basline/ Evergreen** | Weekday service approximately every 20 minutes between 5:30 a.m. and 10:30 p.m. No weekend service. | 1,945 |
| **48 - Cornell** | Weekday service approximately every 20 minutes between 5:30 a.m. and 10:30 p.m. Hourly weekend service Saturdays between 5:30 a.m. and 10:00 p.m., and Sundays between 7:30 a.m. and 9:30 p.m. | 3,840 |
| **52 – Farmington/ 185th** | Weekday service approximately every 20 minutes between 5:30 a.m. and 12:30 a.m. Weekend service every 30 minutes Saturdays between 6:00 a.m. and 12:30 p.m., and Sundays between 6:30 a.m. and 10:30 p.m. | 8,745 |
| **57 – TV Hwy/ Forest Grove** | Service all days approximately every 15 minutes between 5:00 a.m. and 3:00 a.m. | 15,103 |
| **59 – Walker/ Park Way** | Weekday service to bus stops 6 times per day during morning and afternoon peak hours. No weekend service. | 194 |
| **88 – Hart/198th** | Weekday service approximately every 30 minutes between 5:30 a.m. and 11:00 p.m. Hourly weekend service between 6:00 a.m. and 10:00 p.m. | 3,440 |
| **MAX Blue Line** | All stops serviced approximately every 15 minutes weekdays between 4:30 a.m. and 1:30 a.m., and weekends between 5:00 a.m. and 1:00 a.m. | 121,736 |
| **North Hillsboro Link** | Service approximately every 20 minutes between 5:30 a.m. and 9:00 a.m., and every 30 minutes between 1:30 p.m. and 7:00 p.m. | N/A |

*Ridership information based on TriMet data from fall 2015. Ridership numbers represent boarding across entire route, not just Hillsboro portion.

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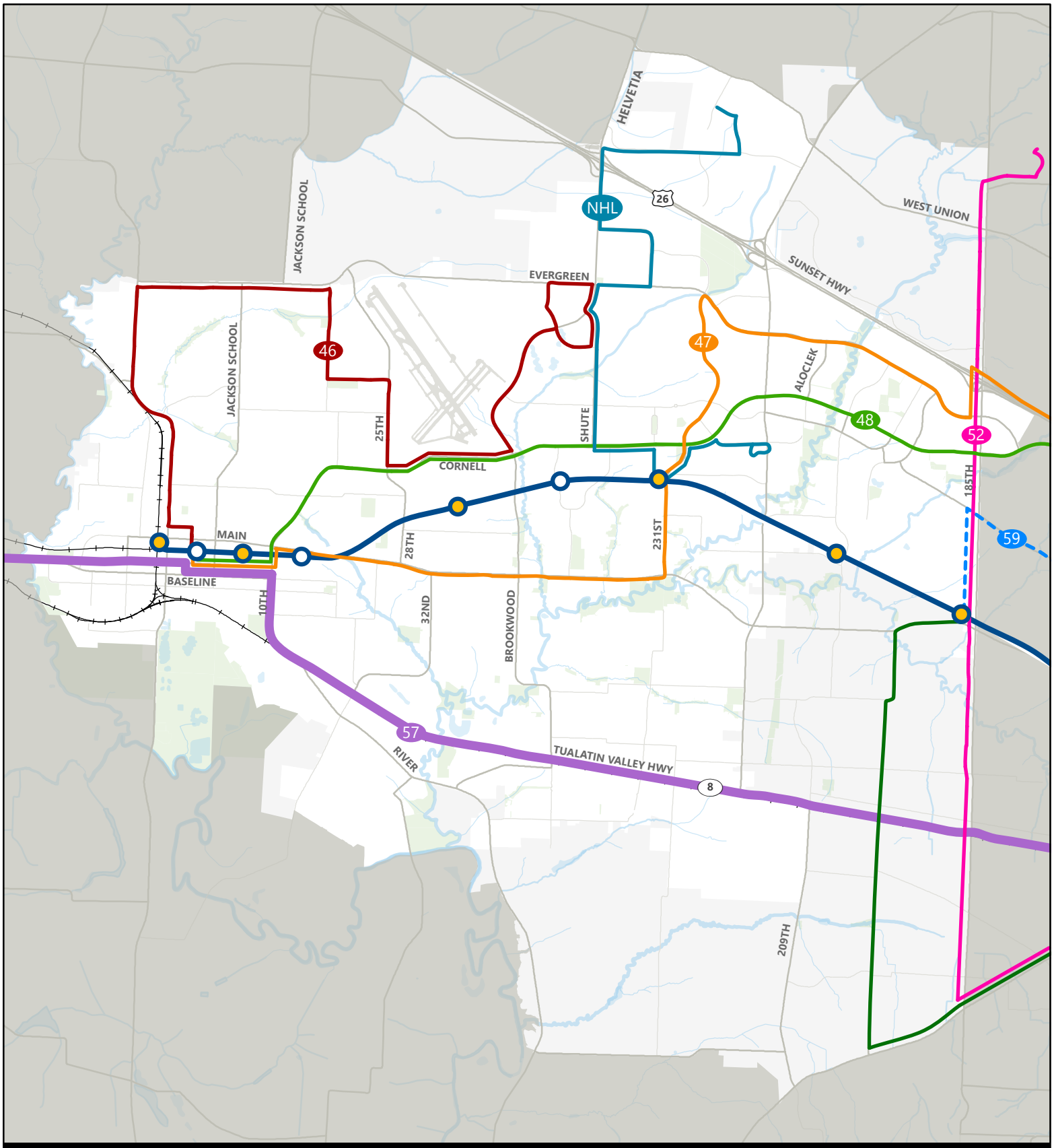


## Figure 20 - Existing Transit Service

TriMet MAX Light Rail

Park & Ride Facility

Frequent Service TriMet Bus Route

TriMet Standard Service Bus Route

TriMet Rush - Hour Service Bus Route

North Hillsboro Link

N

0 2,500 5,000 Feet

Data Source: TriMet 2016 | Plot Date: October 05, 2016

Hillsboro Planning

Hillsboro Planning Department
150 East Main St, Hillsboro, Oregon

### 3.2.2. Transit Accessibility

Users of transit are typically willing to walk up to a half-mile to a transit stop. There are exceptions such as park-and-ride facilities at certain MAX stops which allow users to connect to transit by car. Figure 21 illustrates the ¼-mile and ½-mile "walk sheds" for areas around existing transit stops in the City. "Walk sheds" are actual walking distances which account for the street network layout and barriers such as highways, railroads, water bodies, etc. It represents a more realistic walking distance as opposed to "as the crow flies" radii. A ¼-mile to ½-mile distance equates to a 5- to 10-minute walk for a person of average abilities.

Based on the existing transit service and land use pattern, several areas with high population and employment densities have relatively convenient access to transit; these include Downtown, Orenco, Tanasbourne, and some areas along TV Highway. The convergence of frequent service route 57, route 47, MAX light rail, and route 48 in downtown Hillsboro provide excellent mobility opportunities for populations close to this center. Much of the area is zoned for Station Community Planning, which promotes transit-supportive and pedestrian-friendly mixed-use development. This convergence also provides key transit access—within a 10-minute walk—to areas with high concentrations of youth, persons with disabilities, and other transportation-disadvantaged populations

Certain areas south of TV Highway, between Baseline Road and TV Highway, and in North Hillsboro around US 26 lack convenient access to existing transit services. High frequency transit routes, such as route 57 and MAX Blue Line, provide east/west access connecting Downtown Hillsboro to Beaverton and Portland, but existing transit does not provide sufficient north/south service in the City.

### 3.2.3. Westside Service Enhancement Plan

TriMet's Westside Service Enhancement Plan has a number of future improvements that will address some of the current deficiencies as well as plan for future growth. Over the past few years, TriMet has made a number of system enhancements including a set of improvements specific to the west side of the region, as detailed in the Westside Service Enhancement Plan. The plan focuses on five core areas:

1. Completing the transit grid to better connect areas of development and future growth with MAX and frequent service bus lines.
2. Expanding frequent service bus lines and making performance enhancements, including those for transit priority, to improve reliability and help increase ridership.
3. Providing transit connections and safe crossings near transit stops.
4. Connecting MAX stations to large employers with last-mile improvements.
5. Rethinking how transit is provided to help bring transit to areas that are underserved and areas of low ridership.

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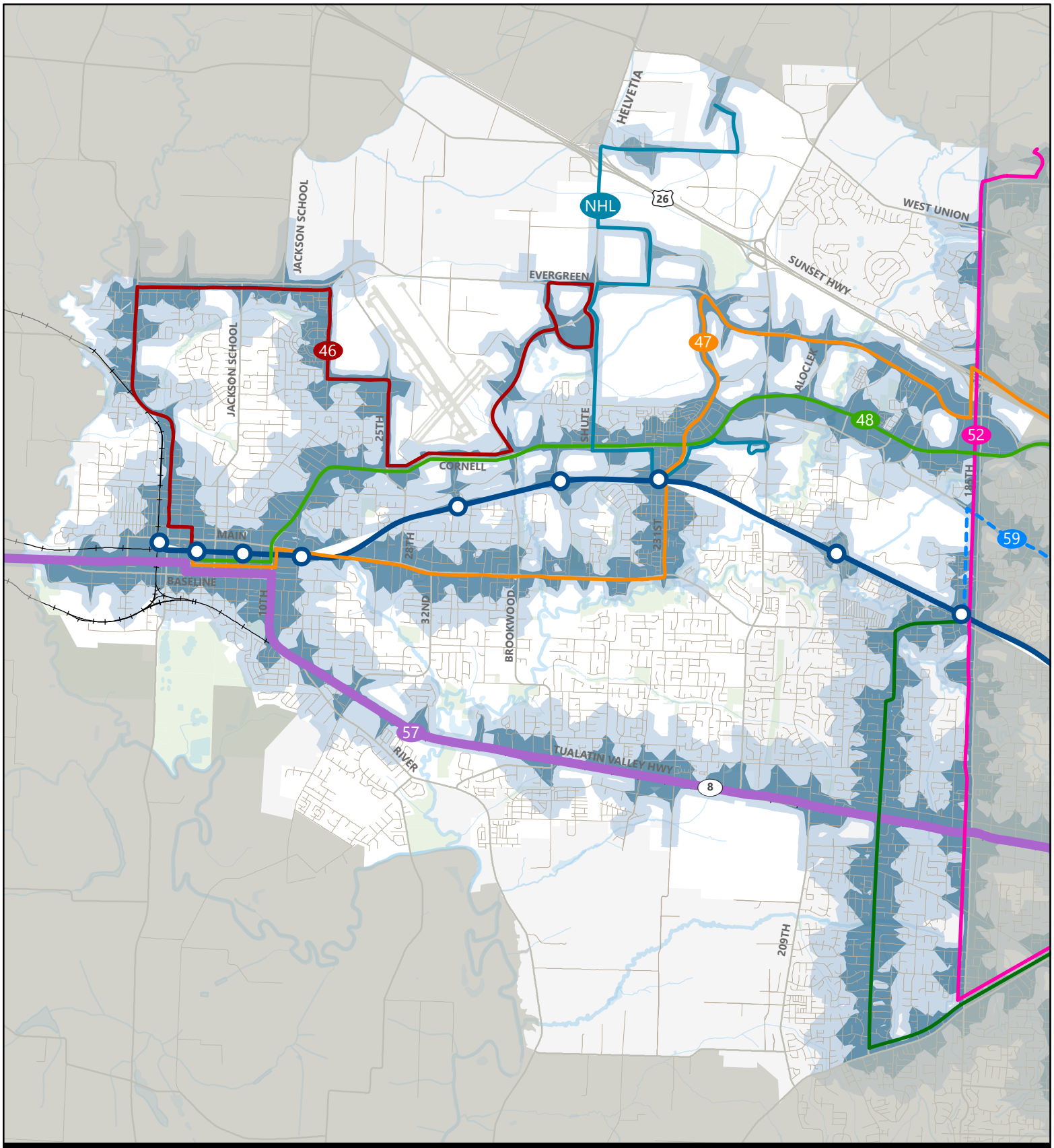


## Figure 21 - Transit Service Area

- 5-minute walk to transit (1/4 mile)
- 10-minute walk to transit (1/2 mile)
- TriMet MAX Light Rail
- XX Frequent Service TriMet Bus Route
- XX TriMet Standard Service Bus Route
- XX TriMet Rush - Hour Service Bus Route
- NHL North Hillsboro Link

N

0 2,500 5,000 Feet

Data Source: TriMet 2016 | Plot Date: October 05, 2016

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## 3.3. Pedestrian System

Good pedestrian connections to public transit are important for promoting usage, increasing safety, and providing ease of transition between modes of active transportation. Most areas in the City robust pedestrian networks that are interconnected with public transit, particularly in downtown Hillsboro and areas surrounding MAX stations. These areas provide streets complete with sidewalks, pedestrian signals, and connections to both bus routes and the MAX line. Figure 22 depict the various pedestrian systems in the study area, and include information regarding sidewalks (both existing and missing), trails, multi-use paths, pedestrian signals, and other pedestrian infrastructure.

### 3.3.1. Multi-Use Paths, Trails, and Accessways

In addition to sidewalk, multi-use paths, trails, and accessways are critical pieces of the transportation system to serve both pedestrians and bicyclists. Multi-use paths and trails are low stress, off-street facilities that allow for both transportation and recreation on foot or via bicycles. Accessways are short pedestrian and/or bicycle paths designed to provide access otherwise not provided by the street system. In other words, they provide pedestrian and bicyclists a short cut in an otherwise disconnected street network.

### 3.3.2. School Bus Accessibility

The Hillsboro School District provides bus transportation for students living farther than the maximum distance allowable by Oregon State standards. Bus stops are located to support safety and efficiency of the overall transportation system. Kindergarten through sixth grade students may be required to walk up to ¼ mile; students in grades 7 through 12 may be required to walk up to ½ mile between their bus stop and their primary residence. Students with special needs are provided transportation accommodations in accordance with their individualized education plans.

## 3.4. Bicycle System

The bicycle system within the City of Hillsboro consists of on-street bike lanes, suitable shoulders, multi-use paths and trails, and shared-use streets. A connected network of bicycle facilities can provide residents with the ability to access transit as well as retail, commercial, recreational, and other land uses. Figure 23 depicts the bicycle facilities in the study area. Connectivity of the bicycle network is important in promoting continued use and mode share changes.

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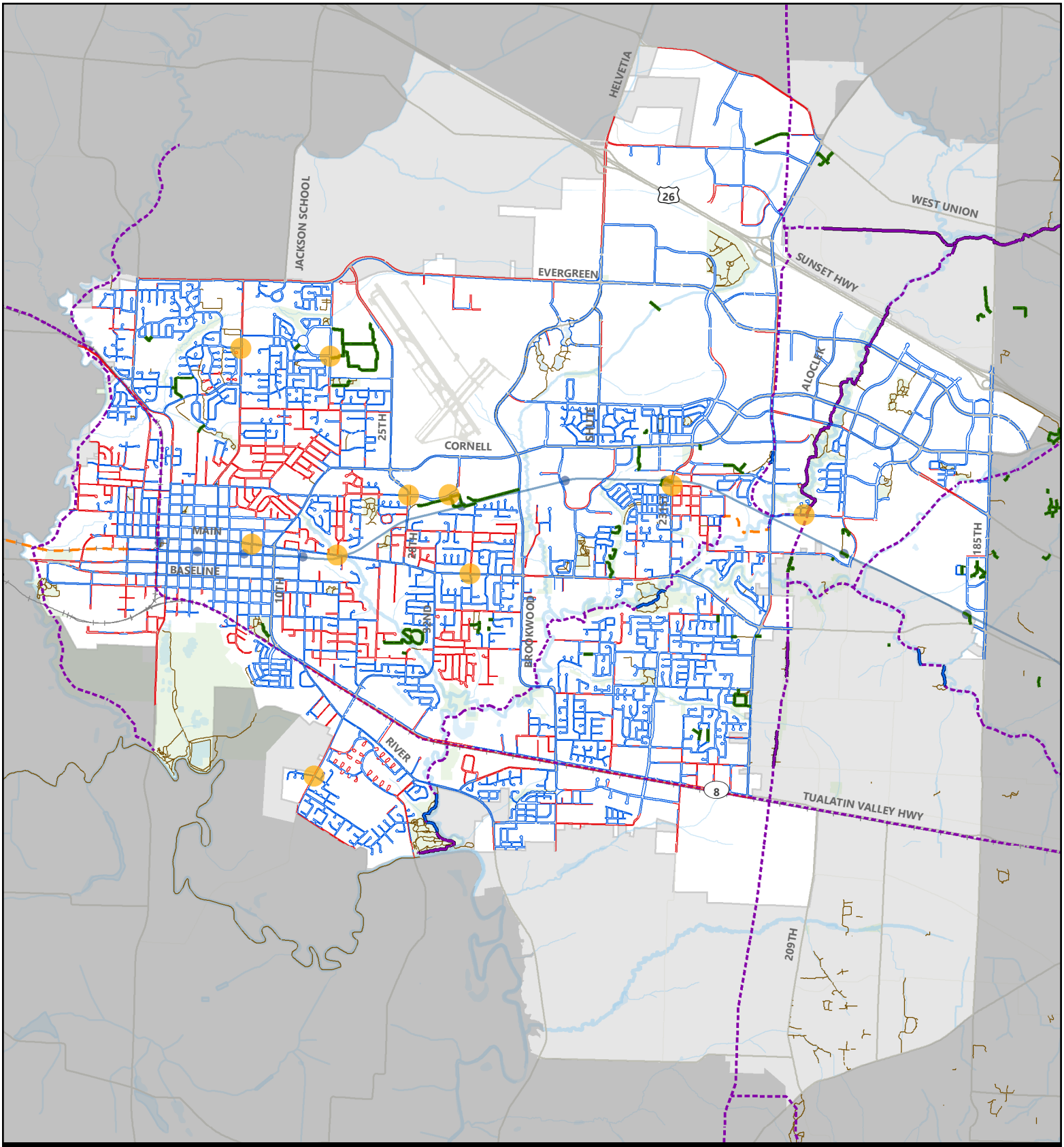


## Figure 22 - Pedestrian Network

- Pedestrian Signals
- Accessway
- Existing Sidewalk
- Missing Sidewalk
- Existing Regional Multi-use Trail
- Existing Pedestrian Trail
- Planned Pedestrian Trail
- Planned Multi-use Trail
- On-Street Connection
- Proposed Trail
- Trails

N

0 2,500 5,000 Feet

Data Source: City of Hillsboro 2010 - 2014 | Plot Date: October 05, 2016

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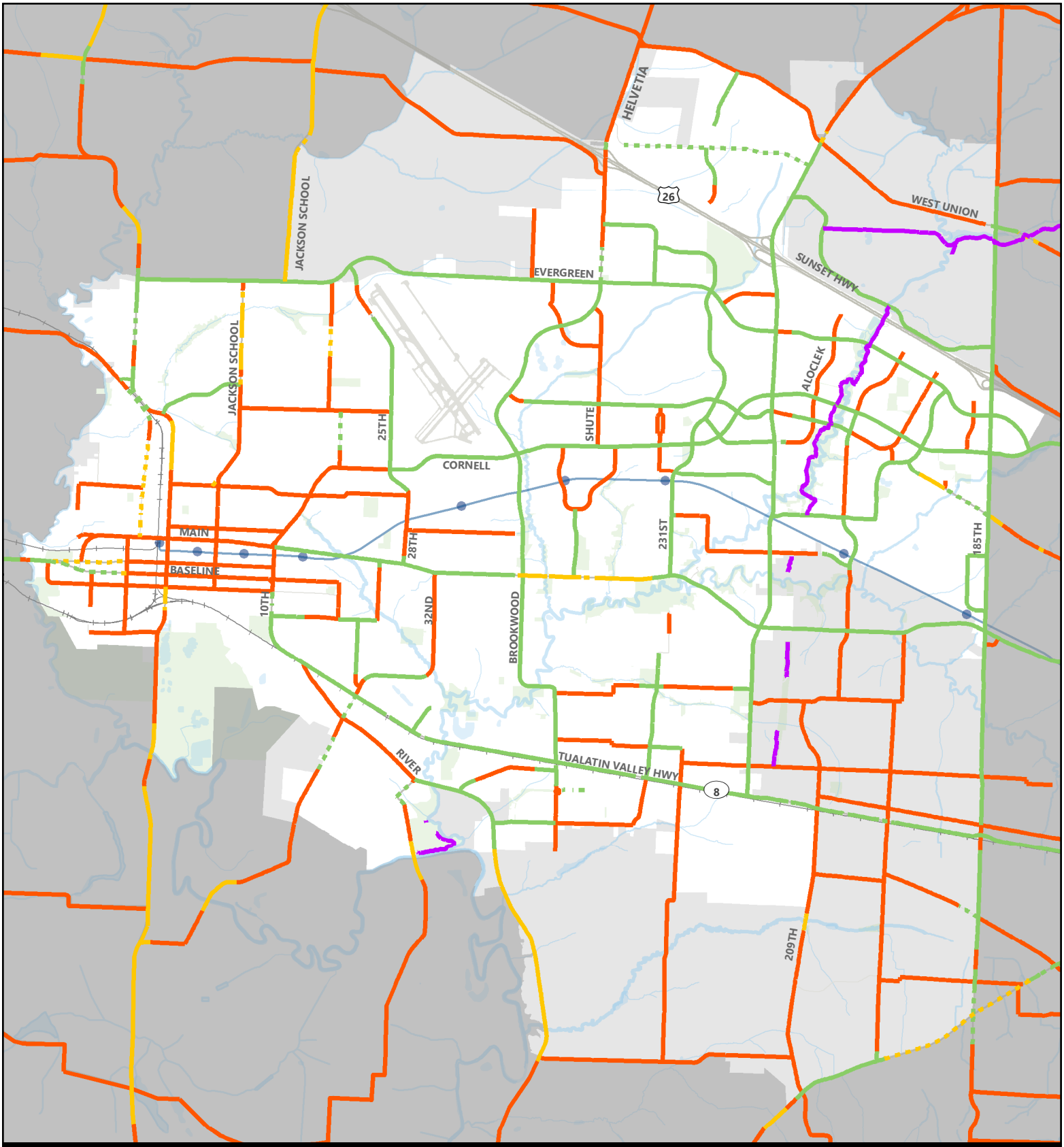


## Figure 23 - Bicycle Facilities

Existing - Both Sides
Existing - One Side
Suitable Shoulder - Both Sides
Suitable Shoulder - One Side
None
Existing Regional Multi-use Trail

N

0 2,500 5,000 Feet

Data Source: City of Hillsboro 2016, Washington County 2016 | Plot Date: October 05, 2016

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# 4. System Performance

The section summarizes the existing traffic volumes on roadways and at intersections and an assessment of traffic operations at select intersections. Understanding how the study intersections operate can help prioritize roadway improvements by highlighting areas where traffic may not be moving efficiently.

## 4.1. Average Daily Traffic

Average daily traffic (ADT) is a simple measurement of how many vehicles use a particular roadway on a typical weekday. ADT volumes are collected at a variety of locations in the City by different agencies on a regular basis. Figure 24 summarizes the ADT volumes for various roadway segments within the City collected in 2015. Based on the volumes collected, other than US 26—a freeway, the busiest roadways in Hillsboro are Cornell Road, TV Highway, 185th Avenue and Cornelius Pass Road with ADT ranging between 25,000 vehicles per day and 56,000 vehicles per day.

## 4.2. Motor Vehicle Turning Movement Volumes

There are approximately 150 signalized intersections within the City. The majority of these signals are maintained by Washington County while a small number are maintained by the City of Hillsboro and by ODOT. For this TSP update, a select group of signals—39 in total—were studied and analyzed to determine their operating conditions. The locations for all signalized intersections along with the 39 study intersections are illustrated in Figure 25.

Figure 26 provides a summary of peak hour turning movement volumes for 39 study area intersections. The data comes from a combination of the recent data collection and data from previous traffic studies. Traffic volume data can help provide a general understanding of how traffic moves through a network and where the system is busiest; however, additional data and further analysis is needed to understand how the user of the roadway experiences those traffic volumes.

Motor vehicle volumes on the roadways in Hillsboro are typically highest during the evening hours and the turning movement volumes are representative of the peak hour at each study area intersection. As previously mentioned, the busiest roadways in Hillsboro are Cornell Road, TV Highway, Cornelius Pass Road and 185th Avenue. Similar to the ADT, the busiest intersections are along those four corridors and also at the US 26 interchanges. The study intersections with the highest peak hour total entering volume are 185th Avenue & Evergreen Parkway and 185th Avenue & Cornell Road; traffic at these two locations are high due to their proximity to US 26 and a large number of employment, retail locations.

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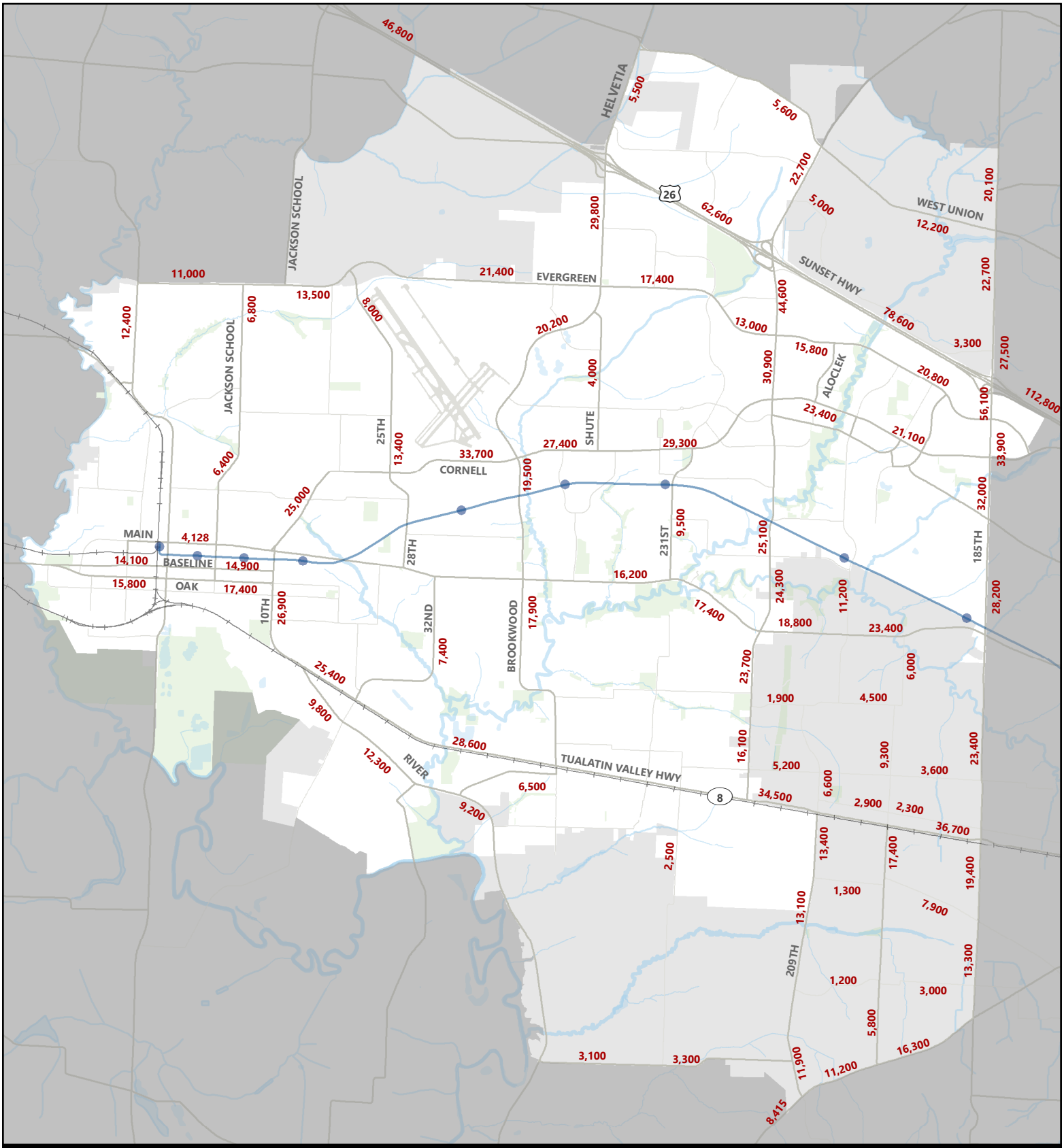


# Figure 24 - Average Daily Traffic

**XX,XXX** Average Daily Traffic (2015)

N

0 2,500 5,000 Feet

Data Source: City of Hillsboro -2015, Washington County - 2015, ODOT - 2015 | Plot Date: October 05, 2016

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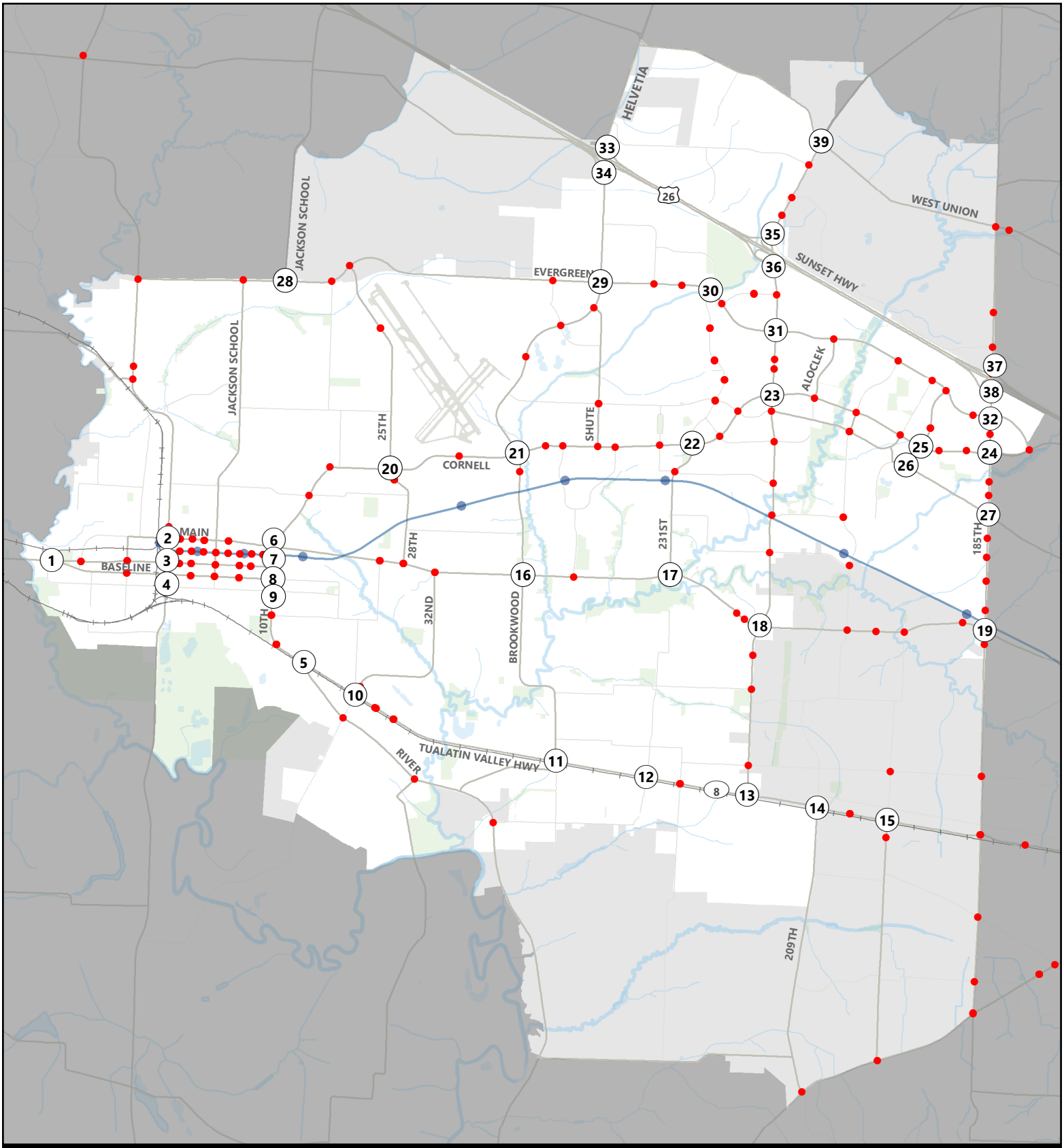


## Figure 25 - Traffic Study Intersections

XX Study Signalized Intersections

• Other Signalized Intersections

N

0 2,500 5,000 Feet

City of Hillsboro: March 17, 2016 | Washington County: March 1, 2016 | Plot Date: September 15, 2016

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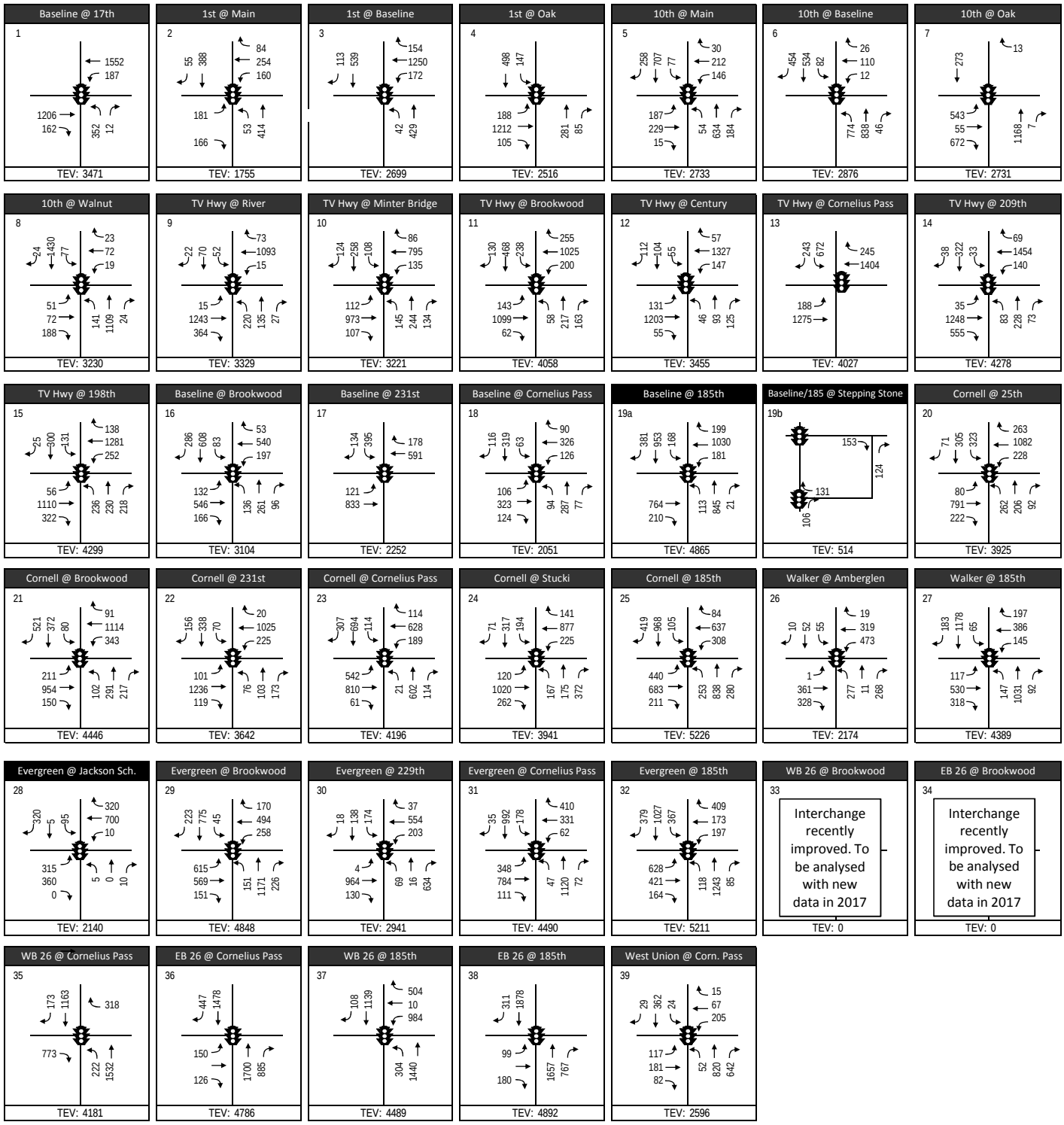


**Figure 26 - Existing PM Peak Hour Intersection Traffic Volumes**

Signalized Intersection
TEV: Total Entering Volume

Traffic counts collected between 2010 and 2016

Hillsboro Planning

## 4.3. Existing Traffic Operations

There are a number of methods (such as level of service, delay, volume-to-capacity) for measuring traffic operations of roadways and intersections. Hillsboro, Washington County, and ODOT use volume-to-capacity (v/c) ratio to establish performance criteria.

### 4.3.1. Volume-to-Capacity (v/c) Ratio

The volume-to-capacity (or v/c) ratio is the measure of traffic volume demand to intersection capacity. It is one method of evaluating the operation of intersections. A v/c ratio of less than 1.00 indicates that traffic volume is less than the capacity. When the v/c ratio is less than 0.60, traffic conditions are generally good, with little congestion and low delays for most intersection movements. As the v/c ratio approaches 1.00, traffic becomes more congested and unstable, with longer delays.

At signalized intersections, some movements, particularly side street approaches or left turns onto side streets, may experience longer delays because they receive only a small portion of the green time during a signal cycle, but their v/c ratio may be relatively low. For these reasons, it is important to examine both v/c ratio and queuing when evaluating the overall operation of intersections.

### 4.3.2. Mobility Standards

The intersections in Hillsboro are monitored through mobility standards (or performance measures). The current TSP update will address mobility standards to align with the standards outlined in Chapter 12 of Hillsboro's *Community Development Code*. For signalized intersections, the current standards calls for the peak hour v/c ratio for each lane group to be no greater than 0.99, unless approved otherwise by the City Engineer. If the intersection is under Washington County or ODOT jurisdiction, the v/c ratio shall not exceed the standards imposed by that jurisdiction or the City standards, whichever is more restrictive.

The standards for unsignalized intersections (stop-sign controlled) are similar to those for signalized intersections. The peak hour v/c ratio for each lane group must be no greater than 0.99, unless otherwise approved by the City Engineer. If the intersection is under Washington County or ODOT jurisdiction, the v/c ratio must not exceed the standards imposed by that jurisdiction or the City standards, whichever is more restrictive. Additionally, the delay during the peak hour for each group of lanes approaching the unsignalized intersection must be maintained at 50 seconds per vehicle or less, unless approved otherwise by the City Engineer.

### 4.3.3. Operations Analysis

Each study intersection was analyzed to evaluate current operating conditions and any elements that are found to be deficient are identified. Figure 27 summarizes the operations for the study intersections. The majority of the study intersections are currently operating at acceptable capacity levels. Of the 39 intersections, the following seven have at least one lane group that exceeds the City's mobility standard:

- Baseline Street & 17th Avenue
- Baseline Street & 10th Avenue
- TV Highway & 209th Avenue
- TV Highway & 198th Avenue
- Evergreen Parkway & 229th Avenue
- Evergreen Parkway & Cornelius Pass Road

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- US 26 westbound ramps terminal & Cornelius Pass Road

The intersections with operations that exceed mobility targets are along major arterial and commuter corridors. The intersections along Cornelius Pass Road near US 26 experience high levels of congestion, likely due to evening rush hour commute traffic leaving the large employment centers along Evergreen Parkway and destined for US 26 and areas to the north.

The intersection of 10th Avenue & Baseline Street experiences heavy volumes in the northbound direction; the high volume of northbound left-turns exceeds the recommended volume for the available capacity. The other study intersections with movements exceeding mobility targets have only one or two movements that fail. The exception is Evergreen Parkway & Cornelius Pass Road; that intersection experiences capacity constraints in every direction.

## 4.4. Key Study Area Intersection Operational Findings

- US 26, Cornell Road, TV Highway, 185th Avenue and Cornelius Pass Road are among the busiest roadways in Hillsboro
- The study intersections with the highest peak hour entering volumes are 185th Avenue & Evergreen Parkway and 185th Avenue & Cornell Road
- Corridors and intersections close to major employment campuses and major retail locations have the highest traffic volumes and are most constrained

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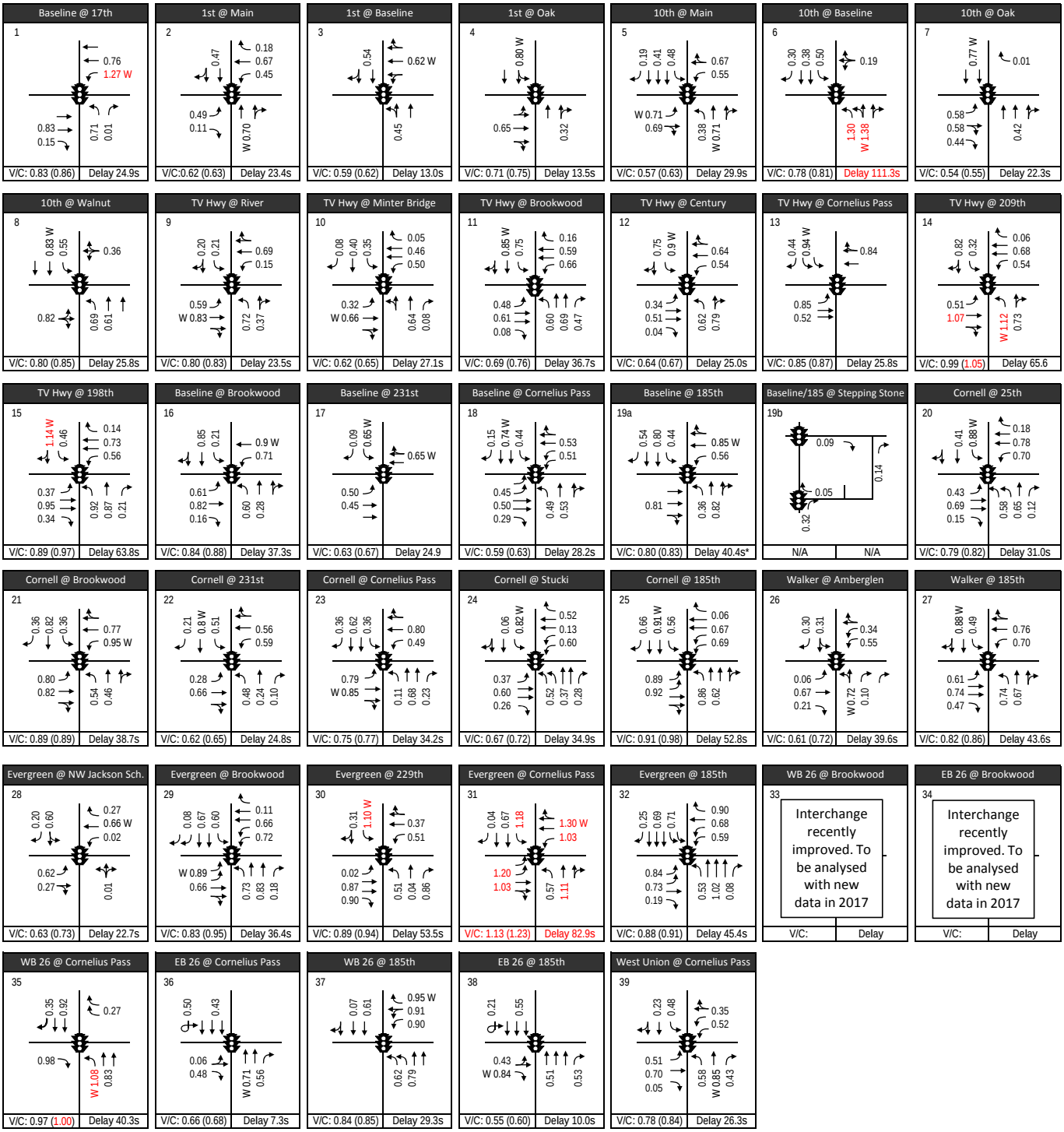


## Figure 27 - Existing PM Peak Hour Intersection Performance

V/C: Volume-to-Capacity Ratio
Existing Lane Condition
Signalized Intersection

W X.XX Worst Movement V/C (City Standard)
X.XX Exceeds Standard(s)
V/C: X.XX (X.XX) Peak Hour Intersection V/C (Peak 15 min)
X.XX Peak Hour Movement V/C
Delay XX.Xs Intersection Delay in Seconds

Hillsboro Planning

## 4.5. Safety performance

In spring of 2016, the City of Hillsboro commissioned a Transportation Safety Action Plan (TSAP), performed in coordination with a Transportation Safety Action Plan for Washington County. Key findings from the report are highlighted herein.

The overarching goal of the Transportation Safety Action Plan is to eliminate transportation-related fatalities and serious injuries in the City of Hillsboro by 2035. From 2010 to 2014, the period of analysis used in the TSAP, there were 127 serious injuries (classified as "injury A") and 17 fatalities related to crashes in the City of Hillsboro, as shown in Figure 28.

The TSAP provides an analysis of crashes in the City of Hillsboro by crash type, crash cause, location type, time of day, age of driver, proximity to transit stops, and proximity to schools. Some highlights of the analysis include:

- Almost half (47%) of traffic-related fatalities involved pedestrians
- Most severe and fatal crashes in the City of Hillsboro occur at intersections. The portion of crashes at intersections is higher than for ODOT Region 1 as a whole
- Drivers in their late teens to early 20s, as well as mid-to-late 50s, crash at higher frequencies than other age groups
- Not yielding the right-of-way is the most common cause of fatal and serious injury crashes

The TSAP also evaluated specific intersection locations using the critical crash rate method. The critical crash rate is a method from the Highway Safety Manual (HSM) that compares observed crash rates of study intersections to a particular threshold crash rate ($90^{th}$ percentile) for intersections of the same geometric type. Table 2 provides a summary of all intersections exceeding the critical crash rate, organized into priority tiers.

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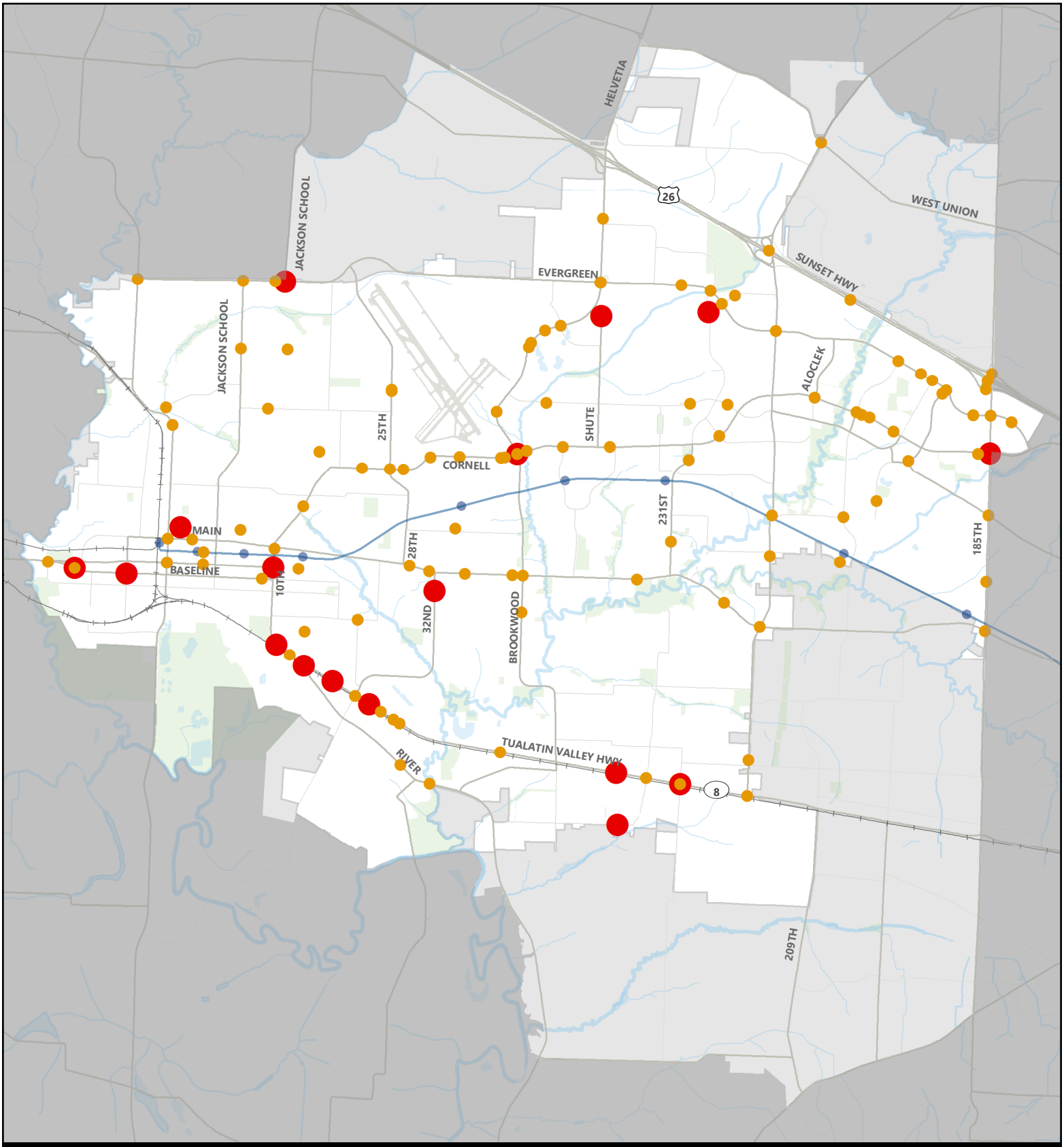


**Figure 28 - Fatal and Serious Injury Crashes (2010-2014)**

Fatality

Serious Injury

N

0 2,500 5,000 Feet

Data Source: City of Hillsboro 2010 - 2014 | Plot Date: October 05, 2016

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**Table 2: Critical Crash Rate Analysis Summary**

| Intersection | | Crash Rate | Critical Crash Rate | Variance |
|---|---|---|---|---|
| Tier 1 Locations | NE Brookwood Parkway & NE Cornell Road | 2.23 | 0.87 | 256% |
| | NW 185th Avenue & Westbound Highway 26 | 1.79 | 0.85 | 211% |
| | S 1st Avenue & SE Oak Street | 1.61 | 0.91 | 177% |
| | SW 198th Avenue & SW Tualatin Valley Highway | 1.49 | 0.86 | 173% |
| Tier 2 Locations | SE Minter Bridge Road & SE Tualatin Valley Highway | 1.37 | 0.89 | 154% |
| | S 1st Avenue & SW Baseline Street | 1.41 | 0.92 | 153% |
| | SW Cornelius Pass Road & W Baseline Street | 1.31 | 0.90 | 146% |
| | NE Brookwood Parkway & W Baseline Street | 1.27 | 0.89 | 143% |
| | NW 231st Avenue & NE Cornell Road | 1.20 | 0.87 | 138% |
| | NE 25th Avenue & NE Cornell Road | 1.12 | 0.87 | 129% |
| | SE 10th Avenue & SE Oak Street | 1.14 | 0.89 | 128% |
| | NE 185th Avenue & NW Evergreen Road | 1.08 | 0.85 | 127% |
| Tier 3 Locations | SE Century Boulevard & SE Tualatin Valley Highway | 1.05 | 0.88 | 119% |
| | NW 185th Avenue & NW Cornell Road | 1.00 | 0.85 | 118% |
| | SE River Road & SE Tualatin Valley Highway | 1.03 | 0.88 | 117% |
| | SW 209th Avenue & SW Tualatin Valley Highway | 0.98 | 0.84 | 117% |
| | SE 10th Avenue & SE Walnut Street | 1.02 | 0.89 | 115% |
| | SE 10th Avenue & SE Baseline Street | 1.02 | 0.90 | 113% |
| | NW 185th Avenue & NW Walker Road | 0.94 | 0.86 | 109% |

In addition to total crashes, the TSAP looked at crashes involving bicyclists or pedestrians. These road users are generally the most vulnerable users – they are more frequently killed or seriously injured by traffic crashes than are motorists. Figure 29 shows fatal and severe pedestrian and bicycle crashes and Figure 30 shows all crashes involving a bicyclist or pedestrian.

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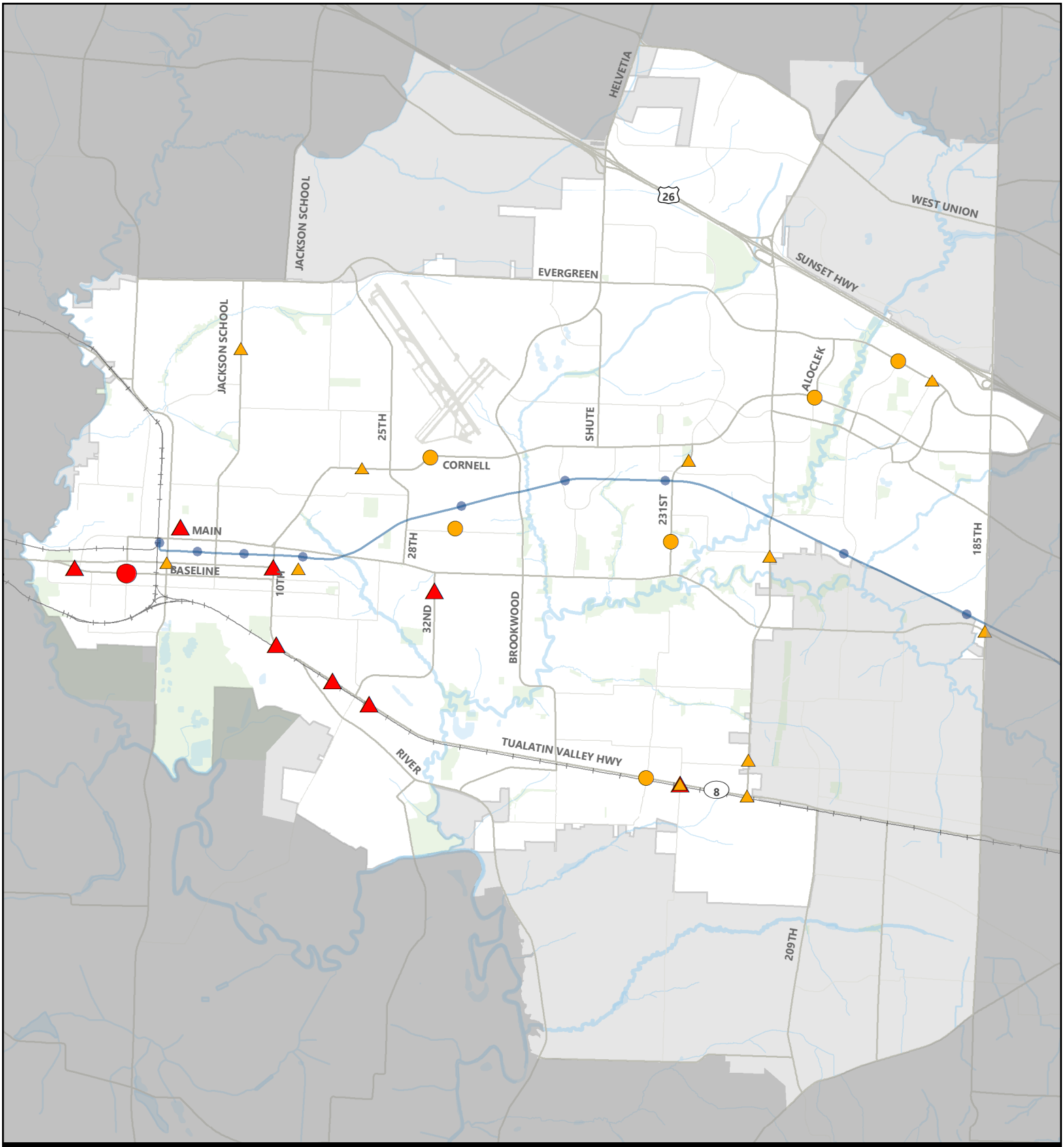


## Figure 29 - Severe Bicycle and Pedestrian Crashes (2010-2014)

- Fatal Bicycle Crash
- Severe Bicycle Crash
- Fatal Pedestrian Crash
- Severe Pedestrian Crash

N

0 2,500 5,000 Feet

Data Source: City of Hillsboro 2010 - 2014 | Plot Date: October 05, 2016

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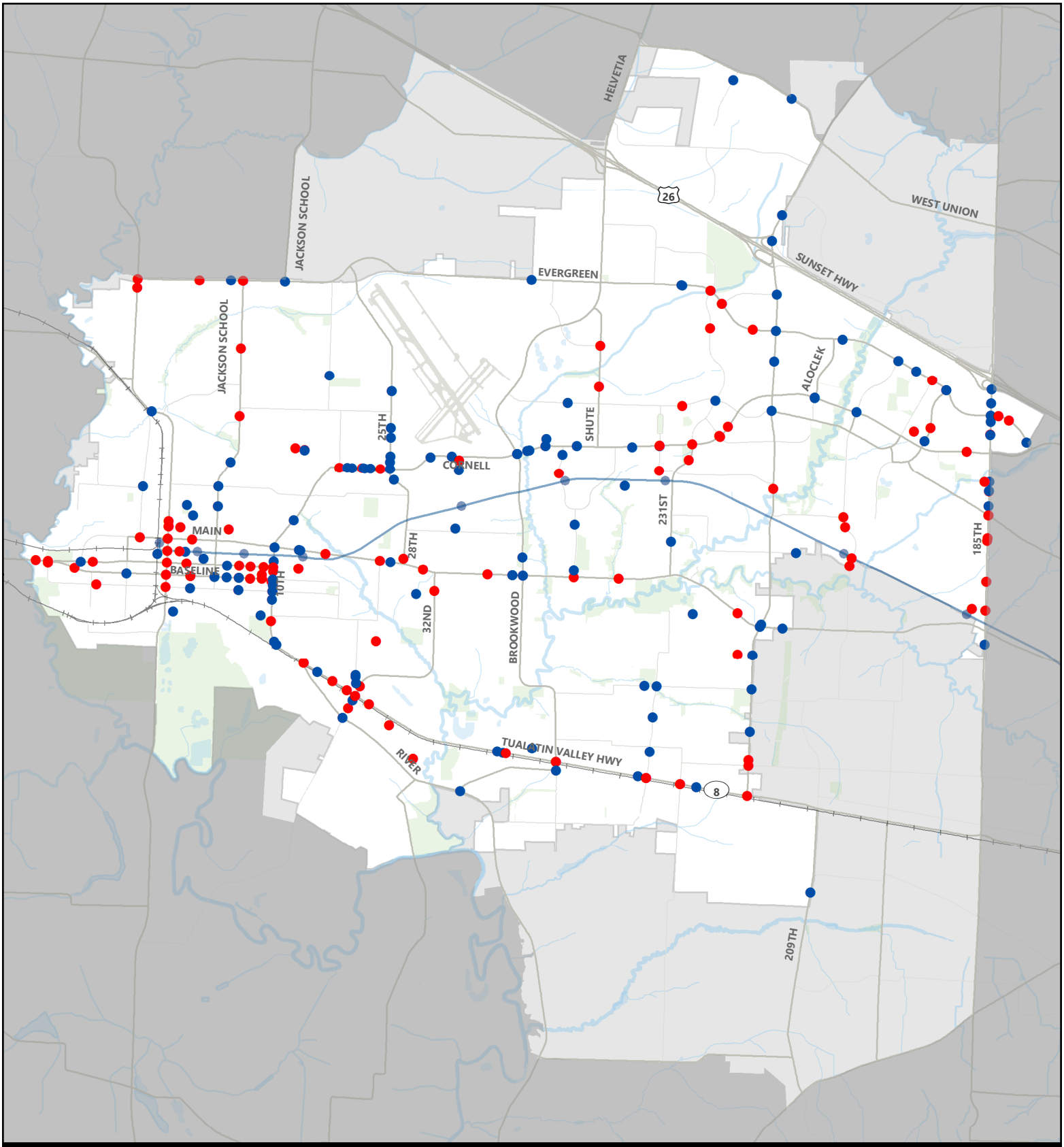


## Figure 30 - Bicycle and Pedestrian Crashes (2010-2014)

- Bicyclist
- Pedestrian

N

0 2,500 5,000 Feet

Data Source: City of Hillsboro 2010 - 2014 | Plot Date: October 05, 2016

Hillsboro Planning

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## 4.6. Key Safety Findings

Some key findings related to bicyclists and pedestrians are shown in the maps and summarized in the TSAP:

- Half of the pedestrian fatalities from 2010-2014 in Hillsboro occurred along the Tualatin Valley Highway (OR 8).
- Pedestrian and bicyclist crashes are clustered in the downtown area and on SE 10th Avenue; this may be due to higher volumes of pedestrians and/or bicyclists in this area, however, pedestrian and bicycle volumes are not included as part of the study.

In addition to the analysis of crashes within the City of Hillsboro, the TSAP reviewed other regional safety analysis documents, noting:

- High Crash Corridors were identified in the Washington County TSAP (done concurrently). Several of those corridors are also located within the City of Hillsboro and can be an area of focus for future recommendations. They are as follows:
    - Tualatin Valley Highway (OR 8)
    - NW 185th Avenue
    - NE Cornell Road
- Metro also has completed an analysis of corridors throughout the region. Several corridors within the City of Hillsboro were identified as being within the top 5 percent of contributors to high severity crashes in the region. These corridors are:
    - W Baseline Street; from SW Oak Street to SE 10th Avenue
    - SW Tualatin Valley Highway (OR 8); from SE Maple Street to East of City Limits
    - E Main Street; from NE 14th Avenue to NE Brookwood Parkway
    - NE Cornell Road; from NE 28th Avenue (Hillsboro Airport) to NE 61st Avenue
    - NE Cornell Road; from NW Aloclek Dr (Rock Creek Trail) to East of City Limits
    - SW Brookwood Parkway; from NE Cornell Road to Highway 26
    - SW Evergreen Parkway; from NW 235th Avenue to NE Cornell Road
    - NW 185th Avenue; from North of the City limits to South of City Limits
    - Walker Road; from NW Stucki Avenue/NW Amberglen Parkway to East of City Limits

The TSAP made preliminary recommendations on safety actions the City of Hillsboro can take. The transportation system planning effort will take into account the trends and key locations identified in the TSAP, as well as review recommendations and take them into account in developing and prioritizing the City of Hillsboro's 20-year TSP project list.

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# 5. Other System Components

This section documents the inventory of facilities including rail, air, water, and pipeline systems within the TSP study area. In addition, Intelligent Transportation System (ITS), Transportation System Management and Operations (TSMO), and Transportation Demand Management (TDM) programs are discussed in this section.

## 5.1. Freight and Rail

Truck and rail freight brings essential goods in and out of Hillsboro. These routes are generally located around areas that have concentrations of commercial or industrial land uses. Freight rail lines within Hillsboro are operated by Portland & Western Railroad (PNWR), a subsidiary of Genesee & Wyoming Incorporated. Figure 31 identifies truck and rail freight routes for Hillsboro.

### 5.1.1. Challenges to Freight Movement

Reliable freight transportation is crucial to the local, regional, and national economies. Congestion and capacity shortfalls can have a detrimental impact on travel times and delivery schedules, and ultimately, on the economy. However, freight needs can be difficult to reconcile with the needs of other modes such as cyclists and pedestrians. The Portland metropolitan area plans for freight at the regional level (in coordination with the state) and has an adopted Regional Freight Plan[11] that identifies the following challenges:

- Congestion and hotspots – chronic road and rail network bottlenecks that impede regional freight/goods movement.
- Reliability – as distinct from congestion, unpredictable travel time due to crashes, construction, special events, and weather (often exacerbated by capacity constraints).
- Capacity constraints – lack of capacity in critical corridors as well as physical and operational issues.
- Network barriers – safety concerns and out-of-direction travel resulting from weight-limited bridges, low bridge clearances, steep grades, at-grade rail crossings, and poorly designed turns or intersections.
- Land use – system capacity and land for industrial uses that is being lost to other activities
- Environmental and other impacts – managing adverse impacts including diesel emissions, greenhouse gas emissions, and water quality, noise, and land use conflicts.

Improved freight movement strategies include expanding intelligent transportation systems; protecting existing industrial uses; ensuring an adequate supply of appropriate, well-located industrial land; encouraging the collocation of high-volume freight users along freight routes; designing roadways to be mode-separated; including freight needs in facility design, particularly on freight routes; and, freeing up capacity on network roadways by reducing the number of vehicle trips and per capita vehicle miles traveled. Policies would focus on taking a system approach to improving freight travel time reliability, protecting industrial lands, and encouraging clean and green technology to reduce environmental impacts.

[11] Metro. (2010). *Regional Freight Plan.* Retrieved from http://www.oregonmetro.gov/sites/default/files/regional_freight_plan_june_10.pdf.

## 5.2. Airports

Hillsboro Airport is located in the north central portion of the City (as illustrated in Figure 31), bounded by Brookwood Parkway to the east, Cornell Road to the south, 25th Avenue to the west, and Evergreen Road to the north. The airport, which is owned and operated by the Port of Portland, does not accommodate commercial flights but instead hosts a variety of services and supports all facets of general aviation activity. The second largest airport in Oregon after Portland International Airport (PDX), Hillsboro Airport sees over 200,000 operations annually. The Hillsboro Airport is defined as a reliever airport by the Federal Aviation Administration (FAA).

> *Reliever airports are specially designated general aviation airports intended to reduce congestion at large commercial service airports. This reliever role is usually accomplished, not by accommodating commercial flights, but by providing an attractive option for the myriad of non-commercial, general aviation aircraft operations that urban areas generate. Hillsboro Airport is classified as a reliever for Portland International Airport (PDX). In this role, Hillsboro Airport is intended to preserve capacity at PDX by offering an alternative operating area for general aviation aircraft, separate from commercial airline and air cargo activities.*[12]

The airport's operator, the Port of Portland, adopted the Hillsboro Airport Master Plan in 2005, which stresses the importance of ensuring the facility's continuing ability to accommodate general aviation activity, which in turn maximizes the runway system at PDX, thus reducing the need for a third parallel runway at PDX. Strategies for accomplishing this goal are detailed in the Master Plan. The Port is preparing to update the Hillsboro Airport Master Plan in 2016, in which issues of compatibility, terminal expansion and/or upgrades, and potential development of adjacent vacant Port-owned parcels are likely to be addressed.

There are three additional aviation facilities in the Hillsboro area:

- Teufel Farm Strip is a private airport located south of TV Highway near 13th Avenue
- Licorice Lane is a private airport located outside the Hillsboro west of Rood Bridge Road
- AmberGlen Business is a private heliport located east of Aloclek Drive between Evergreen Parkway and Cornell Road

## 5.3. Water

There are no navigable waterways within the vicinity of Hillsboro that support commercial use. The Tualatin River, to the south of Hillsboro, is used for recreational purposes.

## 5.4. Pipeline

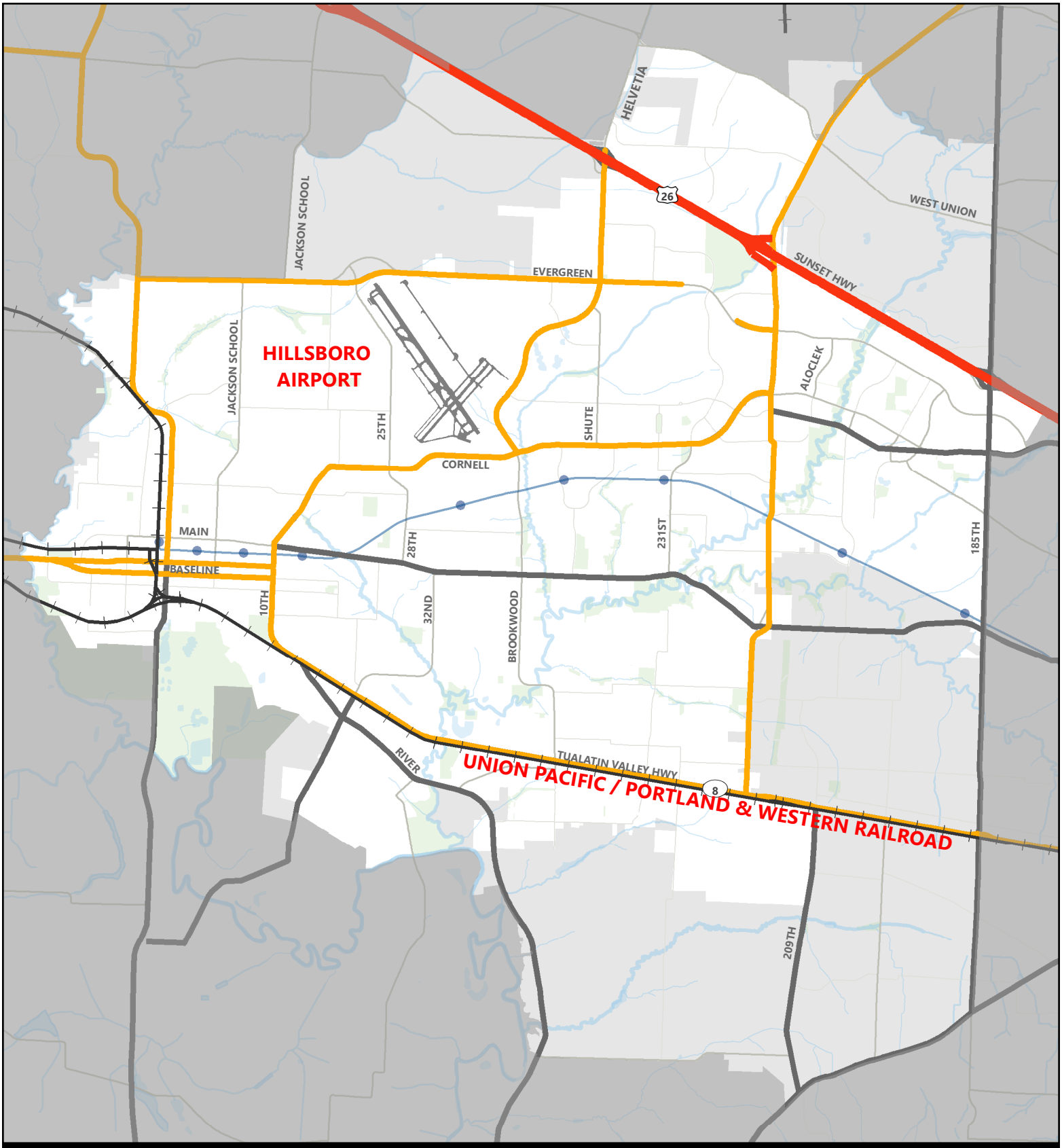
The only major pipeline facilities running through the Hillsboro area are high pressure natural gas feeder lines that are owned and operated by Northwest Natural Gas Company. Figure 32 shows the feeder line routes for Hillsboro. The feeder lines serving Hillsboro originate at Sauvie Island. From Hillsboro, these lines branch north to North Plains and west to Forest Grove.[13] The South Mist Pipeline Extension is a

[12] Port of Portland. (2005). *Hillsboro Airport Master Plan* https://www2.portofportland.com/Airports/Hillsboro/masterplan

[13] *National Pipeline Mapping System Public Map Viewer*, Pipeline and Hazardous Materials Safety Administration. (2012).

new pipeline corridor proposed by Northwest Natural Gas Company that would extend from north of US 26 near North Plains to Molalla and would traverse outside the western city limits of Hillsboro.

DRAFT




## Figure 31 - Freight

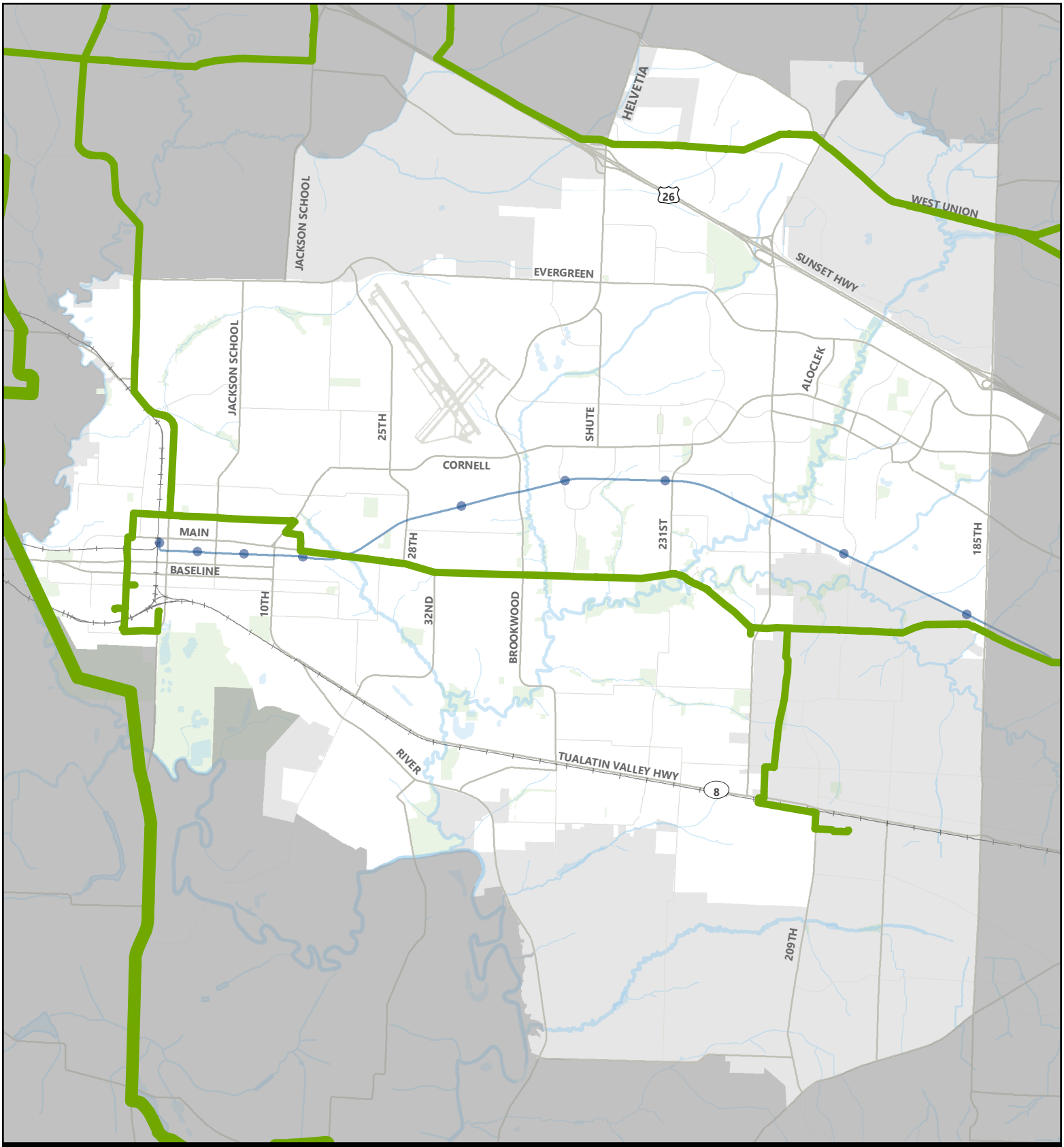
Railroad
Airport
Regional Freight Route
Regional Freight Connector
Local Freight Route

N
0 2,500 5,000 Feet

Data Source: City of Hillsboro 2016, Washington County 2016 | Plot Date: October 05, 2016

Hillsboro Planning

Hillsboro Planning Department
150 East Main St, Hillsboro, Oregon




# Figure 32 - Pipelines

Natural Gas Pipeline Corridor

N

0 2,500 5,000 Feet

Data Source: Washington County 2015 | Plot Date: October 05, 2016

Hillsboro Planning

Hillsboro Planning Department
150 East Main St, Hillsboro, Oregon

## 5.5. Transportation System Management and Operations (TSMO)

Transportation System Management and Operations (TSMO) measures are designed to make maximum use of existing transportation facilities. Efficient management of the transportation system can reduce costs by avoiding the need for more expensive roadway expansion projects. TSMO strategies include traffic control improvements, traffic signal coordination, traffic calming, access management, local street connectivity, and intelligent transportation systems (ITS). ITS encompasses a broad range of wireless and wire line communications-based information and electronics technologies; some example of ITS are variable message signs and advanced message signs that alert road users of upcoming changes, giving them ample time to react.

Figure 33 summarizes the current TSMO and ITS infrastructure in Hillsboro. Most of the TSMO in Hillsboro is found in adaptive signal timing and signal interconnect.

## 5.6. Transportation Demand Management (TDM)

Transportation Demand Management (TDM) measures are designed to reduce vehicle demand, especially for commuter trips in the peak periods. TDM measures can encourage the use of alternative travel modes by serving as an institutional model for businesses in the community. Though the existing and future traffic analyses do not predict significant roadway capacity concerns, implementing TDM measures would support the goals of the TSP to plan and design a transportation system that enhances livability, supports positive health impacts, and decreases reliance on the automobile.

TDM is most effective when it can be specifically designed for the individual needs of a community and when the measures go beyond generic overarching recommendations. Many TDM measures are catered to businesses as a way to provide incentives for their employees to choose multi-modal travel options.

The City of Hillsboro itself has a carpool program, free transit passes for all employees, support for organizations like Westside Transportation Alliance (WTA), and active participation in events like the Bike Commute Challenge. Alternative work weeks are also popular; ECO work weeks (nine-hour work days and then a day off every other week) are a schedule many employees take advantage of. The City does not have a formal practice of tracking private companies' TDM practices.

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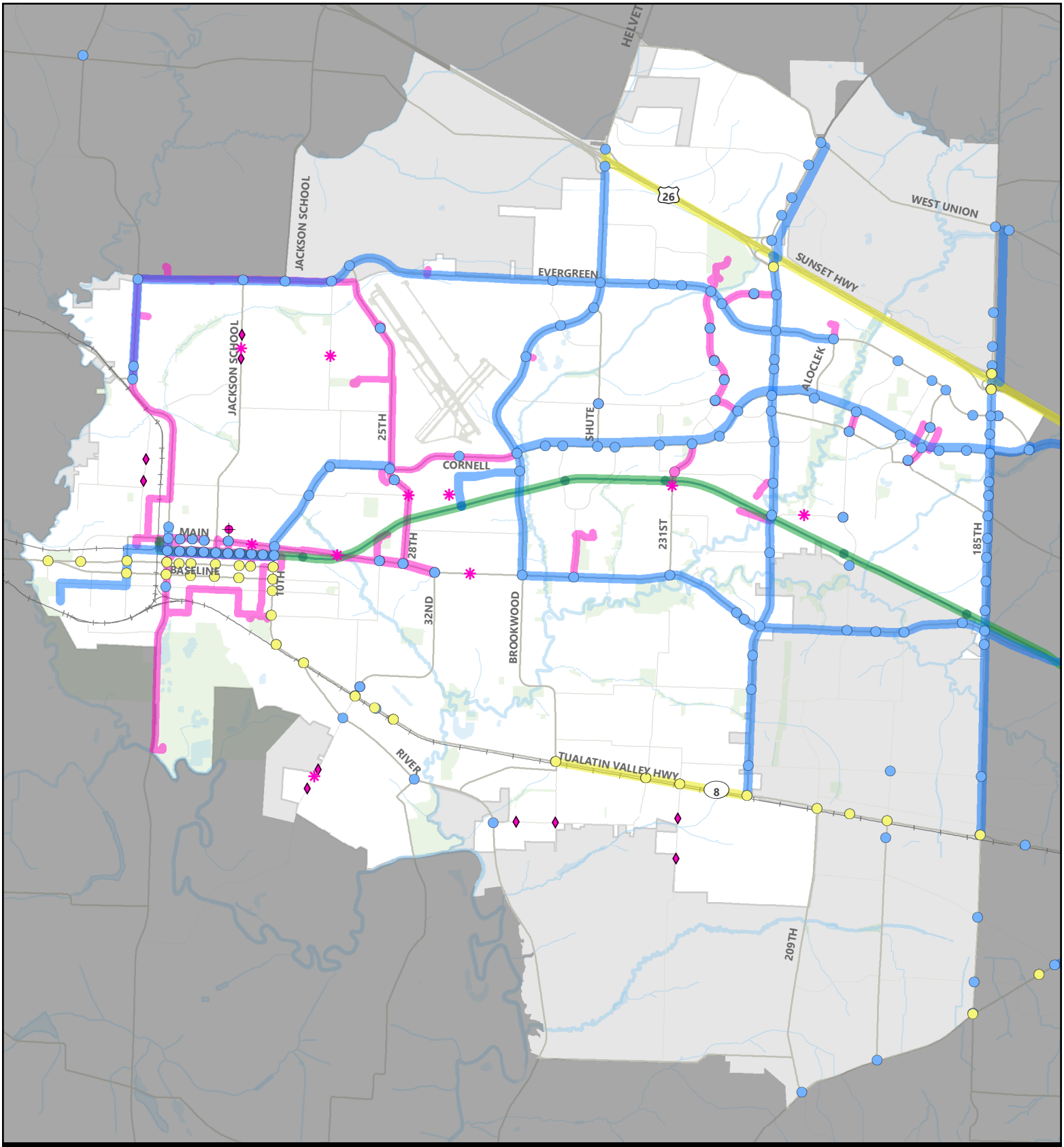


## Figure 33 - Intelligent Transportation System Infrastructure

- Flasher
- Pedestrian RRFB
- School Zone Flasher
- Hillsboro Traffic Signal
- Washington County Traffic Signal
- ODOT Traffic Signal
- City of Hillsboro Fiber Network
- Washington County Fiber Network
- TriMet Fiber Network
- ODOT Fiber Network

N

0 2,500 5,000 Feet

Data Source: City of Hillsboro 2016, Washington County 2016, ODOT 2016, TriMet 2016 | Plot Date: October 05, 2016

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