Transportation System Plan

Multnomah County, Oregon

MULTNOMAH COUNTY TRANSPORTATION SYSTEM PLAN

August 2016

Prepared for:

Multnomah County
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Multnomah County

Transportation System Plan

Multnomah County Transportation System Plan

Multnomah County, Oregon

August 2016

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Transportation System Plan

Multnomah County TSP

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Project No. 17944

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TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

VOLUME II

Appendix A Baseline Report Memo

Appendix B Existing and Future Conditions Memo

Appendix C Sauvie Island and Multnomah Channel Rural Area Transportation System Plan

GLOSSARY OF TERMS

The following terms are applicable only to the Multnomah County Transportation System Plan and are used in this document as defined below:

Access Management: Refers to measures regulating access to streets, roads and highways from public roads and private driveways. Measures may include but are not limited to restrictions on the type and amount of access to roadways, and use of physical controls such as signals and channelization including raised medians, to reduce impacts of approach road traffic on the main facility.

Americans with Disabilities Act (ADA): A civil rights law that prohibits discrimination against individuals with disabilities in all areas of public life, including jobs, schools, transportation, and all public and private places that are open to the general public.

Arterial (Street): County roads that comprise the regional transportation network and provide for travel between communities within the County as well as between counties. Arterials are typically three to five lanes in width and serve a high volume of through traffic. Minor, Major, Principal and Rural are sub-categories of the Arterial Classification..

Average Annual Daily Traffic (AADT): A measure used primarily in transportation planning and traffic engineering that represents the total volume of vehicular traffic on a highway or roadway for a year divided by 365 days.

Average Daily Traffic (ADT): This is the measurement of the average number of vehicles passing a certain point each day on a highway, road or street.

Bicycle Facility: Any facility provided for the benefit of bicycle travel, including bikeways and parking facilities.

Bicycle Network: A system of connected bikeways that provide access to and from local and regional destinations.

Bike Lane: Area within street right-of-way designated specifically for bicycle use. Typically delineated from the vehicular travel lane by an 8 inch white stripe.

Bikeway: Area within street right-of-way for bicyclists as well as other uses such as walking. Typically delineated from the vehicular travel lane by a 4 inch white stripe.

Capital Improvement Plan (CIP): A community planning and fiscal management tool used to coordinate the location, timing and financing of capital improvements over a multi-year period.

Capacity: The maximum number of vehicles or individuals that can traverse a given segment of a transportation facility with prevailing roadway and traffic conditions.

Collector (Street): County roads that distribute traffic between local streets and the Arterial network. Collectors are typically two to three lanes in width, and serve more local trips and fewer through trips than Arterials. Neighborhood, Major, and Rural are sub-categories of the Collector classification.

Comprehensive Plan Advisory Committee (CAC): An advisory committee consisting of volunteer community members from the community they represent. CAC members reviewed, discussed, and recommended approval of all of the policies and strategies identified in the Comprehensive Plan, including new policies and those retained from earlier editions of the Comprehensive Plan and Rural Area Plans. Members of the CAC also served on four subcommittees, transportation and public facilities being one, where they engaged in more in-depth discussion of policy issues and recommendations.

Context Sensitive Design: Roadway standards and development practices that are flexible and sensitive to community values. Context sensitive design allows roadway design decisions to better balance economic, social and environmental objectives.

Department of Environmental Quality (DEQ): A regulatory agency whose job is to protect the quality of Oregon's environment.

Department of Land Conservation and Development (DLCD): A public agency that helps communities and citizens plan for, protect and improve the built and natural systems that provide a high quality of life.

Driveway (DWY): A private means of access, connecting one or more properties to the local public road system. A private driveway may be a private access easement that connects properties to the local public road system.

Eastbound (EB): Traveling toward the east.

Fiscal Year (FY): A year as reckoned for taxing or accounting purposes.

Geographic Information Systems (GIS): A system designed to capture, store, manipulate, analyze, manage, and present all types of spatial or geographical data.

Grade: A measure of the steepness of a roadway, bikeway or walkway, usually expressed in a percentage form of the ratio between vertical rise to horizontal distance, (e.g. a 5% grade means that the facility rises 5 feet in height over a 100 feet in length.)

Impervious Surfaces: Hard surfaces that do not allow water to soak into the ground, increasing the amount of stormwater running into the drainage system.

Level of Service (LOS): A qualitative measure describing the perception of operation conditions within a traffic steam by motorists and or passengers. An LOS rating of "A" to “F” describes the traffic flow on streets and at intersections, ranging from LOS A, representing virtually free flow conditions and no impedance to LOS F representing forced flow conditions and congestion.

Local (Street): A public road under Multnomah County jurisdiction that is outside a city and is not a county road, state highway or federal road. The County is not responsible to maintain, repair or improve a local access road unless the Board finds an emergency or public need as required under ORS 368.031.

Manual on Uniform Traffic Control Devices (MUTCD): A document issued by the Federal Highway Administration (FHWA) of the United States Department of Transportation (USDOT) to specify the standards by which traffic signs, road surface markings, and signals are designed, installed, and used.

Metropolitan Planning Organization (MPO): An organization in each federally recognized urbanized area (population over 50,000), as designated by the Governor, which has the responsibility for planning, programming and coordinating the distribution of federal transportation resources.

Multi-Modal: Involving several modes of transportation including bus, rail, bicycle, motor vehicle, etc.

Multi-Use Path: Off-street route (typically recreationally focused) that can be used by several transportation modes, including bicycles, pedestrians and other non-motorized modes (i.e. skateboards, roller blades, horses, etc.)

Neighborhood Route (Street): A street that provide access primarily to residential land uses and link neighborhoods to higher order roads. They generally have higher traffic volumes than local streets.

Northbound (NB): Traveling toward the north.

Oregon Administrative Rules (OAR): The official compilation of rules and regulations having the force of law in the U.S. state of Oregon. It is the regulatory and administrative corollary to Oregon Revised Statutes, and is published pursuant to ORS 183.360 (3).

Oregon Department of Transportation (ODOT): A public agency that helps provide a safe, efficient transportation system that supports economic opportunity and livable communities throughout Oregon.

Oregon Revised Statutes (ORS): The codified body of statutory law governing the U.S. state of Oregon, as enacted by the Oregon Legislative Assembly, and occasionally by citizen initiative. The statutes are subordinate to the Oregon Constitution.

Peak Period or Peak Hour: The period of the day with the highest number of travelers. This is normally between 7:00 to 9:00 AM or 4:00 to 6:00 PM on weekdays.

Pedestrian Facility: A facility provided for the benefit of pedestrian travel, including walkways, crosswalks, signs, signals and benches.

Right-Of-Way (ROW or R/W): Property that the public has a right to use for transportation and transportation related purposes.

Safety Priority Index System (SPIS): An indexing system used by Oregon Department of Transportation to prioritize safety improvements based on crash frequency and severity on state facilities.

Safe Routes to School (SRTS): Federal, state, and local programs that create safe, convenient, and fun opportunities for children to bicycle and walk to and from schools.

Shared Roadway: Roadways where bicyclists and autos share the same travel lane. May include a wider travel lane and/or bicycle boulevard treatment (priority to through bikes on local streets).

Southbound (SB): Traveling toward the south.

Statewide Transportation Improvement Plan (STIP): The capital improvement program that identifies funding and schedule of statewide projects.

Technical Advisory Committee (TAC): An advisory committee consisting of state, county, and city staff that review and provide feedback on technical memorandums for the Comprehensive Plan and Transportation System Plan Update.

Technical Memorandum (TM): A document that is specifically targeted to technically-trained persons, such as practicing engineers, engineering managers, or planners, who are interested in the technical details of the project or task.

Traffic Control Devices: Signs, signals or other fixtures placed on or adjacent to a travelway that regulates, warns or guides traffic. Can be either permanent or temporary.

Transportation Analysis Zone (TAZ): A geographic sub-area used to assess travel demands using a travel demand forecasting model. Often defined by the transportation network and US Census blocks.

Transportation Demand Management (TDM): A policy tool as well as any action that seeks to reduce single-occupant vehicle trips, especially during peak travel demand periods. Refers to actions which are designed to change travel behavior in order to improve performance of transportation facilities and to reduce need for additional road capacity. Methods may include subsidizing transit for the journey to work trip, charging for parking, starting a van or car pool system, or instituting flexible work hours.

Transportation and Growth Management (TGM): A program of the Oregon Department of Transportation (ODOT) that supports community efforts to expand transportation choices. By linking land use and transportation planning, TGM works in partnership with local governments to create vibrant, livable places in which people can walk, bike, take transit or drive where they want to go.

Transportation Planning Rule (TPR): A series of Oregon Administrative Rules intended to coordinate land use and transportation planning efforts to ensure that the planned transportation system supports a pattern of travel and land use in urban areas that will avoid the air pollution, traffic and livability problems faced by other large urban areas of the country through measures designed to increase transportation choices and make more efficient use of the existing transportation system.

Transportation System Plan (TSP): Is a comprehensive plan that is developed to provide a coordinated, seamless integration of continuity between modes at the local level as well as integration with the regional transportation system.

Two-Way Stop Control (TWSC): An intersection, where one or more approaches is stop controlled and must yield the right-of-way to one or more approaches that are not stop controlled.

Urban Growth Boundary (UGB): A regional boundary, set in an attempt to control urban sprawl by mandating that the area inside the boundary be used for higher density urban development and the area outside be used for lower density development.

Vehicle Miles Traveled (VMT): The cumulative distance a vehicle travels, regardless of number of occupants.

Volume to Capacity Ratio (V/C): A measure that reflects mobility and quality of travel of a roadways or a section of a roadways. It compares roadway demand (vehicle volumes) with roadway supply (carrying capacity).

Westbound (WB): Traveling toward the west.

PREFACE

The development of this plan was guided by the Project Management Team (PMT) and the Comprehensive Plan Community Advisory Committee (CAC) and their Transportation Subcommittee. The PMT and CAC Transportation Subcommittee rosters are below, along with members of the consultant team. The CAC Transportation Subcommittee members devoted a substantial amount of time and effort and their participation was instrumental in the development of the Multnomah County Transportation System Plan (TSP). Multnomah County's future transportation system has been enhanced because of their commitment.

Project Team

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Comprehensive Plan Community Advisory Committee Transportation Subcommittee

Aaron Blake *East of Sandy River*	Martha Berndt *Sauvie Island*
Andrew Holtz *Portland Resident*	Paula Sauvageau *West Hills*
Catherine Dishion *East of Sandy River*	Rayford Davenport *East of Sandy River*
George Sowder *West Hills*	Sara Grigsby *East of Sandy River*
Jerry Grossnickle *West Hills*	Stephanie Nystrom *East of Sandy River*
Karen Nashiwa *Portland Resident*	Tim Larson *Sauvie Island/Multnomah Channel*
Kathy Taggart *West of Sandy River*	Will Rasmussen *West Hills*
Linden Burk *East of Sandy River*	Chris Foster *Planning Commission Member*
Marcy Cottrell Houle *Sauvie Island/Multnomah Channel & West Hills*	John Ingle *Planning Commission Member*

Section 1
Introduction

INTRODUCTION

Transportation is the movement of people and goods from one place to another. Our transportation systems affect nearly every aspect of life. We import the basic necessities of life – food, clothing, and building materials – to our homes. A constant flow of freight supplies our lives. We travel to work and school, and move about to socialize and play. Streets create the framework around which our cities and counties are built. Personal choices about how we travel affect our daily lives and our physical and mental well-being. Transportation is the backbone that supports a community as it grows and evolves.

The Multnomah County Transportation System Plan (TSP) forms the transportation element of the Multnomah County Comprehensive Plan. Prior to this update to TSP, the Comprehensive Plan was supported by separate Transportation System Plans (TSPs) for the Rural Westside and West of Sandy River areas (covering the West Hills, Sauvie Island, and West of Sandy River Area Plans) and, the transportation components of the East of Sandy River Area Plan and the Columbia River Gorge Scenic Area Management Plans. The updated Multnomah County TSP incorporates relevant elements from all of these plans into this one document.

The TSP is the master plan for how the County's rural transportation system will evolve and develop for the next 20 years. The plan's primary focus is on enhancing the safety of the transportation system and balancing the needs of agricultural, visitor, residential, bicycle, pedestrian, and freight travel to and from the rural areas. The TSP supports economically vital and healthy communities.

This TSP provides Multnomah County with guidance for operating and improving the multimodal transportation system. The TSP includes transportation policies and priorities for projects and programs to implement over the next 20 years. It also provides a vision for longer term projects that could be implemented, should additional funding become available. The TSP is intended to be flexible to respond to changing community needs and revenue sources over the next 20 years and will be updated approximately every 5 to 10 years. The TSP builds consensus among the County, state, and other agencies on area transportation needs and priority projects and informs local citizens on the projects that will be carried forward for funding from local, state, and federal sources.

TRANSPORTATION SYSTEM PLAN GOAL

Review of the County's previous TSPs and Area Plans and input from the Project Management Team (PMT) and Comprehensive Plan Community Advisory Committee (CAC) provided the base for which the goal for this plan was developed. The goal provides a clear vision of what Multnomah County aims to achieve.

> **GOAL**: To provide a safe and efficient transportation network for all modes of travel that serves the rural areas of the County and achieves the following objectives:

1. Implement a transportation system that is safe and efficient in meeting the needs of area residents.
2. Implement a balanced transportation system that supports all modes of travel.
3. Develop a transportation system that supports the rural character of unincorporated Multnomah County.
4. Develop a transportation system the supports a healthy economy.
5. Provide transportation improvements in a timely manner according to funding capability.
6. Reduce vehicle traffic on rural County roadways caused by those traveling through the area.

The CAC also provided direction on policies to guide Multnomah County and assist with achieving the goals outlined above. These are included in Section 4.

KEY TRANSPORTATION ISSUES

The plan focuses on addressing both current as well as year 2035 needs of the transportation system. The central needs identified as part of this process are:

- **Reduce Modal Conflicts**– Most of Multnomah County's rural areas are served by two-lane narrow rural roadways. A variety of users with diverse needs and varying speeds (e.g., farm equipment, an active cycling community, pedestrians, and motorists) use the roadway, which can result in conflicts between modes.
- **Enhance Safety for All System Users** – Recent crash history reflects a tendency toward single vehicle crashes with fixed objects after leaving the roadway.
- **Manage Travel Demand**– Peak traffic conditions, resulting from commuter traffic, seasonal events (such as access to public beaches, recreational areas and pumpkin patches) and limited duration events (such as concerts and farm-to-table dinners), result in traffic congestion and long vehicle queues. In addition to causing delays, highly congested roadways can have a potential impact on emergency response times.
- **Address Increasing Traffic and Safety Issues While Maintaining Rural Character –** Although there are an increasing number of vehicles on the roads, residents are concerned transportation improvements and roadway widening will affect the rural character of the area. The County will have to address the issues caused by this increase through planning of safety and other improvements that do not change the character of the area. Improvements and solutions should include context sensitive design.
- **Reduce Traffic Pressure on County Roads**– County rural roads are increasingly used as an alternative route to State highways, creating heavy traffic flows and congestion during commute hours and increasing safety concerns. Examples include the use of West Hills Roads to connect US-30 and US-26. Solutions for these roads are needed that increase

safety and traffic flow without encouraging more traffic, building more roadways, or widening roadways and impacting wildlife and their habitat.

- **Bicycle Infrastructure** – Traveling and commuting by bicycle has become increasingly popular in Multnomah County, but most bicycle network improvements have been focused in the urban areas. As the number of bicyclists continues to grow, investment also needs to be made in the rural areas of the County. Some types of bicycle infrastructure can also serve pedestrians in rural areas, such as providing for shoulders.
- **Better Road Maintenance** – The County's rural roads are experiencing increased traveler use, creating a need for better road maintenance. State and local gas tax have been the primary funding in the past but are not keeping pace to needs.
- **Health and Equity** – Recent research has shown that transportation has a significant impact on health and the well-being of members of the community. Transportation can also cause or support health inequities between different sub-groups within the community. The benefits and burdens of the transportation system should be equitably distributed throughout the County.
- **Water Transport** – Due to the Willamette River and the freight transportation it supports, water transport is important to the County's economy and transportation system.
- **Wildlife Crossings** – Transportation improvements often negatively impact wildlife and their habitats, especially roadway widening. Further partnerships and research can be examined to create design treatments that minimize these negative impacts.

TSP UPDATE PROCESS

The TSP Update process included a series of technical memoranda, meetings with the Comprehensive Plan Community Advisory Committee (CAC) and Transportation Subcommittee to review policies, projects, and priorities, two public workshops, meetings with the Bicycle and Pedestrian Advisory Committee, and meetings with other stakeholders and interested parties. The technical memoranda included a review of existing plans and policies, memos on existing and proposed policies, a review of the existing transportation network, and draft plan elements including maps, projects, and priorities. Regular meetings with the PMT allowed for effective coordination throughout the project. All technical memoranda can be found in the Technical Appendices.

PLAN ORGANIZATION

Sections 2 through 5 comprise Volume 1 of the TSP and provide the main substance of the plan. Technical Appendices in Volume 2, which contains the technical memoranda, supplement Volume 1.

Section 2 describes the transportation system existing and future conditions and needs.

Section 3 presents an overview of potential solutions and treatments included in the TSP.

Sections 4 and 5 will form the Transportation Element of the Comprehensive Plan and include goals and policies (Section 4) and transportation projects, studies, and programs to implement over the next 20 years (Section 5).

Section 2
Existing and Future Conditions

EXISTING AND FUTURE CONDITIONS

The following section describes the existing plans, policies, and transportation system needs within five rural areas of Multnomah County. Additionally, this section describes the existing population, demographics, and land uses within the rural areas. This section also describes future projections for population and employment in unincorporated Multnomah County, projected traffic volumes on ODOT facilities, and an overview of currently planned projects to address existing and future needs.

STUDY AREA

The Transportation System Plan (TSP) focuses on the five rural areas of the county, including West Hills, Sauvie Island, West of Sandy River, East of Sandy River, and Columbia River Gorge National Scenic Area. These areas are illustrated in Figures 1A and 1B.

PLANS AND POLICIES

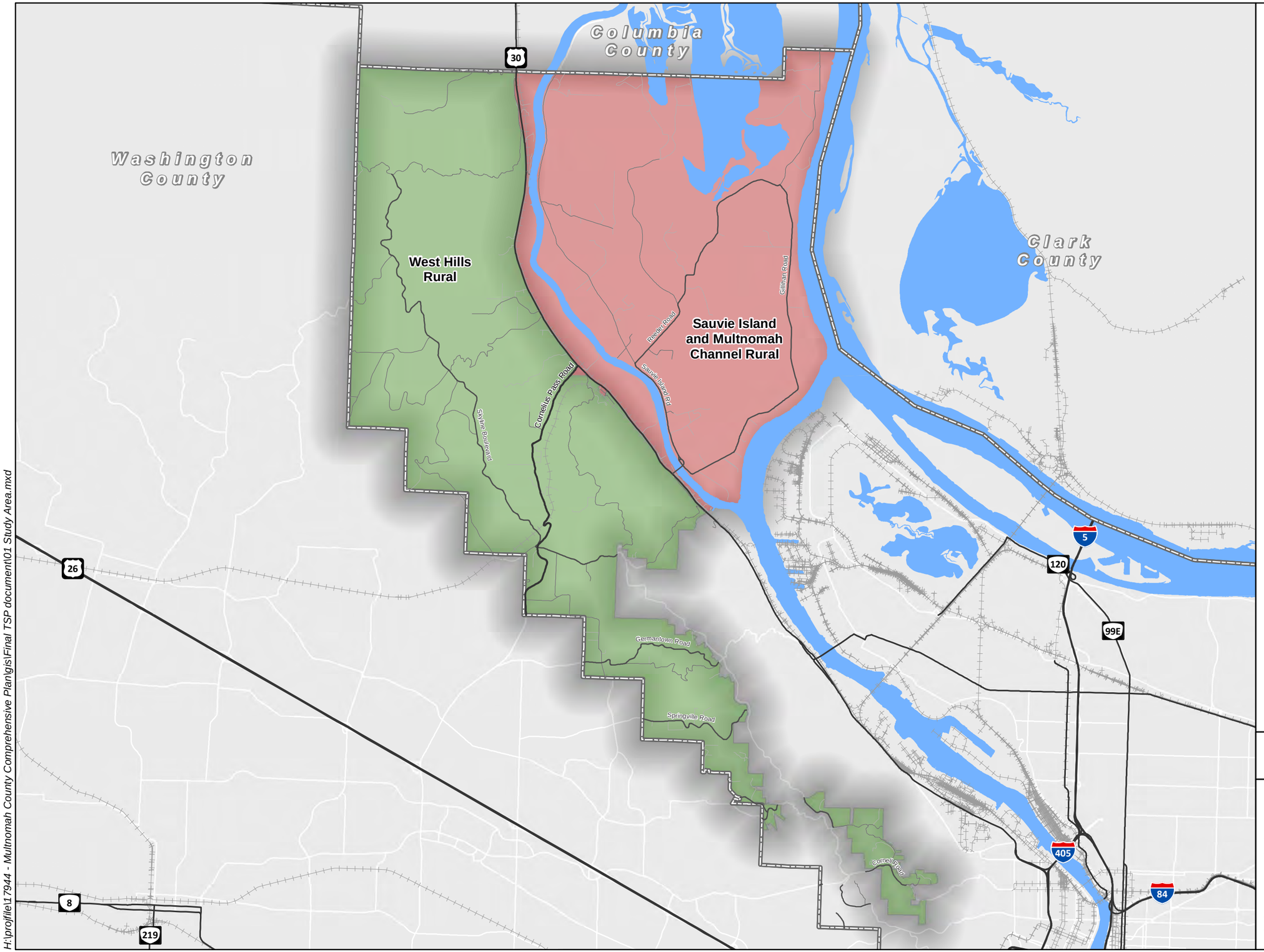
Plans and documents that include policies and projects relevant to the Transportation System Plan include:

- Multnomah County Comprehensive Framework Plan [Policies 33 – 36]
- Rural Area Plans
    - Columbia River Gorge NSA Rural Area Plan Policy Document (2005)
        - Columbia River Gorge National Scenic Area Management Plan (2011)
    - East of Sandy River Rural Area Plan (1997) [Transportation Section]
    - West of Sandy River Rural Area Plan (2005) [Transportation Section]
    - West Hills Rural Area Plan (1996) [Transportation Section]
    - Sauvie Island/Multnomah Channel Rural Area Plan (2015)
- Transportation Plans
    - Westside Rural Area Transportation System Plan (1998)
    - Sauvie Island/Multnomah Channel Transportation System Plan (2015)
    - Functional Classification of Trafficways Findings and Recommendations Technical Report (2003)
    - Pedestrian Master Plan (1996)
    - Bicycle Master Plan (1990)
- Transportation Capital Improvement Plan and Program Fiscal Years 2014-2018 (2014)

The Baseline Report Memo dated November 2014 in Volume II, Appendix A, contains the description of these documents and policies.

Multnomah County
Comprehensive Plan

Figure 1A
Study Area



Plan Areas

- Sauvie Island and Multnomah Channel Rural
- West Hills Rural
- County Boundaries

0 0.5 1 2 Miles

Prepared By:
Kittelson & Associates, Inc.

Date:
8/29/2016

Coordinate System:
NAD 1983 HARN State Plane Oregon North FIPS 3601

Disclaimer:
This map is intended for informational purposes only. While this map represents the best data available at the time of publication, Multnomah County makes no claims, representations, or warranties as to its accuracy or completeness. Metadata available upon request.

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Multnomah County

Comprehensive Plan

Figure 1B

Study Area

Clark County

Skamania County

Hood River County

Clackamas County

Government Island

Interlachen Urban

Troutdale UPA

Pleasant Valley Urban

Springwater

West of the Sandy River Rural

East of the Sandy Rural Area

Columbia RIver Gorge National Scenic Rural

Bonneville Dam

84

30

212

211

224

26

Halsey Street

Glisan Street

Stark Street

Marine Drive

Woodard Road

Hurburt Road

Division Drive

Orient Drive

Bluff Road

Gordon Creek Road

Lusted Road

Evans Road

Brower Road

Larch Mountain Road

Troutdale Road

257th Avenue

302nd Avenue

223rd Avenue

Plan Areas

- Bonneville Dam
- Columbia River Gorge National Scenic Rural Area
- East of Sandy Rural Area
- Government Island
- Interlachen Urban
- Pleasant Valley Urban
- Springwater
- Troutdale UPA
- West of the Sandy River Rural
- County Boundaries

0 1 2 4 Miles

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KEY TRANSPORTATION ISSUES

This TSP addresses current and future transportation needs, particularly related to the increasing traffic on rural roads, increasing modal conflicts, and the need for increased safety, bicycle and pedestrian infrastructure, and better road maintenance. The TSP also considers transportation needs related to community health, equity, and the potential for wildlife impacts. A key component of the plan is the identification of a range of potential programs, policies, and projects that the County can implement over the next 20 years.

The following sources provided insights on existing transportation needs:

- public outreach related to the Sauvie Island & Multnomah Channel Rural Area Plan Update in 2013;
- review of relevant plans and policies;
- a review of the existing transportation system inventory, traffic data and crash data;
- needs identified through Sauvie Island and Multnomah Channel stakeholder interviews conducted from November 2014 through February 2015 by the project team;
- feedback from the public on transportation issues and project maps at TSP public meetings including 14 CAC meetings and four transportation subcommittee meetings; and,
- implementation needs for transportation related policies in the Sauvie Island & Multnomah Channel Rural Area Plan and the on-going countywide Comprehensive Plan Update.

Based on information from the above efforts, the transportation needs generally fall into the following categories:

- Reduce Modal Conflicts
- Enhance Safety
- Manage Travel Demand
- Address Increasing Traffic and Safety Issues While Maintaining Rural Character
- Reduce Traffic Pressure on Westside Roads
- Bicycle Infrastructure
- Better Road Maintenance
- Health and Equity
- Water Transport
- Wildlife Crossings

The following sections outline the relevant needs to consider for each of these categories.

Reduce Modal Conflicts

The majority of Multnomah County rural areas are served by two-lane narrow rural roadways. A variety of users with diverse needs and varying speeds (e.g., an active cycling community, pedestrians and

motorists, farm equipment) share the roadway, which can result in conflicts between modes. Some of the issues related to these potential conflicts are discussed below.

In the West Hills and Sauvie Island, there are no dedicated pedestrian or bicycle facilities along roadways today, and roadway shoulders are narrow or non-existent in most places. There are short segments of dedicated bicycle facilities in East County, including parts of Highway 26, Telford Road, and Stark Street. The 1998 Transportation System Plan, focused on the west side of Multnomah County and identified the need for four foot shoulders along major segments of Skyline Boulevard, Germantown Road, Springville Road, Laidlaw Road, Thompson Road, Sauvie Island Road, Reeder Road, and Gillihan Road, but the County has not yet implemented these projects. Constraints on most of these roadways include limited right-of-way to provide wider shoulders or a parallel multi-use path and potential improvement costs and construction constraints near the levees on Sauvie Island create significant barriers to implementation. A complete list of the study area projects included in the County's 2014-2018 Capital Improvement Program (CIP) is provided in the Existing and Future Conditions Memo in Appendix 2.

In addition to safer facilities, stakeholders identified the need to provide wayfinding and information related to restrooms, water, and parking locations as well as education and outreach for all road users on sharing and obeying the rules of the road. Within Multnomah County, East County and Sauvie Island are popular destinations for recreational cyclists, particularly on weekends

There are constraints throughout the County to constructing wider shoulders for bicycles including right-of-way, drainage, grades, and wildlife crossings. A unique situation on Sauvie Island is that many areas along Sauvie Island Road and Reeder Road are within the Sauvie Island Drainage Improvement Company (SIDIC) levee right-of-way and set back area. Construction along these sections of the roadways require special permitting from the Army Corps of Engineers and can only be considered if they will enhance the structural integrity of the levee. The County or Corps of Engineers would need to determine if construction of a multi-use path parallel to the loop roadways, on the island side of the levee could enhance the structural integrity of the levee and be approved by the Corps.

Enhance Safety

Both the County's policies and stakeholder feedback identify the importance of improving safety for all transportation system users in Multnomah County.

Crash data was obtained from ODOT and reviewed to establish a baseline for identifying potential safety-related improvements. This review revealed the following areas with a pattern of crashes:

- I-84
- US 30
- Cornelius Pass Road

- Skyline Boulevard
- Germantown Road
- Corbett Hill Road
- Reeder Road/Sauvie Island Road intersection

Manage Travel Demand

The majority of the year the transportation network primarily serves residents, agricultural uses, and daily business operations in Multnomah County rural areas. Average daily traffic volumes on most of the roadways throughout the county are typically less than 3,000 vehicles per day. The West Hills experience high levels of commuting traffic during peak hours. Local and collector roadways are used to cross through the West Hills in addition to Cornelius Pass Road, an arterial.

Additionally, the popularity of the trails and recreational areas in East County and beaches, hunting and fishing areas, recreational cycling opportunities, seasonal festivals, and agri-tourism activities on Sauvie Island, lead to significant fluctuations in daily traffic volumes during the summer and fall peak seasons. During these times for example, Sauvie Island Road can serve as many as 17,000 vehicles per day and 1,800 cyclists per month. These higher demand periods result in traffic congestion and long vehicle queues at access points to key visitor destinations. In addition to causing delays, highly congested roadways concern residents because of the potential impact on emergency response times.

This TSP includes solutions for managing traffic in Multnomah County during peak hour, events, and seasons to ensure safe multimodal travel while supporting a vibrant economical, agricultural, and recreational economy over the next 20 years. This TSP also recognizes that efforts to reduce travel demand will have to happen in coordination with other cities and counties because the traffic generators are not always located within rural Multnomah County.

Address Increasing Traffic and Safety Issues While Maintaining Rural Character

Although rural County residents recognize the need for improving the local road system, they also cherish the rural character of the areas they live in and prefer not to have more roads built or existing roads widened to a significant degree in order to accommodate increased traffic and to provide greater travel safety. Many of the comments from the public recognize the traffic problems caused by growing population and commute patterns, but seek solutions that will not result in more road construction. Although traffic continues to grow, rural County roads are not meant to handle regional through traffic. Residents value the trees, wildlife, and the pastoral countryside characteristic of Multnomah County's rural areas and do not want to see the landscape and habitat diminished by construction of new and expanded roads, particularly in areas of steep slopes where large retaining walls would be necessary. Rural residents will see even greater demands placed on the local road system as nearby urban lands are developed. Possible solutions for addressing increasing traffic and safety concerns might include

traffic signal timing plan updates, dedicated bike facilities, sidewalks or wider shoulders in appropriate places, and travel demand management.

Context Sensitive Design

Context sensitive design is an important strategy to maintain the rural character of roadways in unincorporated Multnomah County. It allows for minimal changes to the system, right-of-way, and character of the roadways while improving service to roadway users. As seen below through the range of solutions in Section 3 and in the planned projects listed in Section 5, there are context sensitive options for addressing transportation issues, especially in terms of providing bicycle and pedestrian facilities. These options include intermittent shoulders, bicycle pull outs, climbing lanes, and others that would create less impact than full shoulder improvements or bicycle lanes.

Reduce Traffic Pressure on County Roads

Many of the comments from the public identify the need to reduce traffic pressure on roads in unincorporated Multnomah County. These issues are related to increased volumes of both vehicles and bicyclists on fairly, narrow two lane roadways. Many of these roadways have little to no shoulders and do not have any facilities for pedestrians and runners. The West Hills roads serve both recreational and regional commute needs, which create inherent conflicts. Additionally, in East County, some conflicts arise from traffic resulting from visitors and truck traffic travelling through the area. The County has begun to address some of these issues through planning for safety improvements to Cornelius Pass Road and other improvements identified in Rural Area Plan transportation system plans.

Bicycle Infrastructure

Bicycle use has become increasingly popular in the Portland Metropolitan Region as a desirable commuter alternative as well as for recreational activity. Within Multnomah County's heavily populated urban areas, significant investment is being made to improve the transportation system for the safety of bicycles now sharing the roads with vehicles. For the more scarcely populated rural areas, less investment has been made in improving the road system to accommodate bicycles and to reduce road sharing conflicts with vehicles. Promotion of bike touring as an economic engine will likely draw an even greater number of bicyclists in the future to our rural roadways and bike paths. Community members also indicated some desire for bicycle facilities that can also serve pedestrians, such as shoulders along the roadway.

Better Road Maintenance

With increased use of the County's rural roads comes the need for more road maintenance. Rural residents have cited the need for more frequent road maintenance as a major concern. For the County, the key to sustaining an effective, ongoing maintenance program is a stable funding source. Typically,

state and local gas tax money is used for local road maintenance. However, the state gas tax revenues have been diminishing revenues associated with improved fuel efficiency and have not been adjusted accordingly to keep pace with the growing maintenance need. Deferred roadway maintenance activities in turn increase the overall cost of road maintenance. The County has a local gas tax which similarly has not been adjusted to reflect cost increases.

Health and Equity

An increasingly large body of research now shows that transportation decisions directly and indirectly impact human health by influencing a wide range of "health determinants". Health determinants—also referred to as "social determinants of health" or "risk factors"—are features of the built, social, and natural environment that are known to impact an individual's risk of experiencing negative health outcomes such as injury or illness. According to the American Public Health Association, "fifty percent of the leading causes of death and illness in the United States—traffic injuries, heart disease, cancer, diabetes, and respiratory illness—are preventable" because "these diseases have several risk factors that can be mitigated by transportation policies."[1] The Baseline Report in Appendix A that was prepared for the Comprehensive Plan update contains existing conditions information about planning related health determinants and outcomes in different parts of Multnomah County.

The majority of this research has also highlighted that the benefits and burdens of transportation decisions have fallen unequally on different sub-groups within communities. As a result, many transportation decisions to date have inadvertently supported or exacerbated health inequities.

As a result of the increasing awareness of the connections between transportation systems, health, and equity, transportation plans must provide an opportunity to address historical inequities and improve the health and well-being of all its community members. An increasing number of state, regional, and local transportation plans are acknowledging these connections by including goals and metrics that mention both health and equity. Locally, this trend is evident in the inclusion of health and equity policies and goals in Metro's Regional Transportation Plan and in Clackamas County's recently updated TSP. In Multnomah County, the cities of Portland and Gresham are working on including similar policies and goals into their Comprehensive Plan and TSP updates. Multnomah County itself has addressed equity and health, by including criteria in the County's Capital Improvement Plan and Program.

Water Transport

Water transport is a significant freight resource in Multnomah County due to the Willamette River and the ports along its length. This additional option for transporting freight reduces the number of trucks

[1] American Public Health Association. (2009). *At the Intersection Of Public Health And Transportation*. Washington, DC: American Public Health Association.

and trains needed on land to support the county's economy and has a significant impact on the transportation system. Future projects and policies looking forward must work together with water transport to not interfere with this important mode of freight transportation.

Wildlife Crossings

There are concerns from the County and its residents about the impacts to wildlife due to transportation improvements, specifically due to widening of roadways. Road and shoulder widening projects can disturb wildlife habitat, widen wildlife crossing distances, and increase vehicle volumes and speeds on the roadway further increasing the challenge of crossing roadways for wildlife. The County, as part of this process, has started collaborating with Metro and other agencies to identify key wildlife corridors and select studies and data that can lead to developing design standards in the future that minimize impacts of transportation improvements on wildlife.

Metro has a literature review on wildlife corridors and permeability, specifically addressing trail effects and road effects, including noise and artificial light. These issues are described in more detail in Metro's Wildlife Crossings Guidebook. The Portland-Vancouver Regional Conservation Strategy can help identify fish, wildlife, and habitat locations and provide information about natural resources. Additionally, local and state development regulations can be examined including Clean Water Services, City of Portland Bureau of Environmental Services, Clackamas County Water Environment Services, Division of State Lands, and city tree regulations.

POPULATION AND DEMOGRAPHICS

Information about the rural area population and demographics was gathered to support the existing and future conditions analysis, particularly in working with the public to develop and evaluate transportation scenarios that capture the County's vision.

For further information on land use and population, please see the "Population Demographics, Zoning, and Development" section of the Baseline Report memo, Appendix B, prepared for the Comprehensive Plan Update by Angelo Planning Group dated December, 2014.

Population and Growth

As shown in Table 1 reports the population of Multnomah County and its sub-areas. Multnomah County's population in 2010 was just over 735,000 whereas the 2000 Census figure was 660,446. The county grew by 11.3%, or about 1.08% per year, from 2000 to 2010. This growth follows a similar trend to that experienced by the overall State of Oregon, which grew by 11.97%, or about 1.14% per year, during the same period. Appendix B provides more details on population and growth.

Table 1 Year 2010 Area Populations

Area	2010 Census
Multnomah County	735,334
East of Sandy River	3,926
West of Sandy River	10,184
West Hills	10,052
Sauvie Island	888

Source: 2010 Census Block Group Data

Family and Household Data

Figures 2A and 2B show the existing household density represented by households per acre. Additional information can be found in Appendix B.

Future Employment and Household Projections

Metro provided information about anticipated employee and household growth in Multnomah County's unincorporated areas. This information is summarized in Table 2. Employment is projected to grow at approximately 3.5 percent per year from 2010 to 2040. Households are projected to grow at about 3.2 percent per year from 2010 to 2040. However, these projections include both the urban and rural areas of unincorporated Multnomah County.

Table 2 Employee and Household Projections for Unincorporated Areas in Multnomah County

Year	2010	2025	2035	2040	2010-2040 Growth	Annual % Growth
Employees	3,961	5,866	7,170	8,100	4,139	3.48%
Households	4,911	6,555	7,092	9,579	4,668	3.16%

Minimal increases in jobs and housing are projected for the majority of the East County rural areas with the exception of moderate projected growth in households and employment in the western portions of the West of Sandy River area. In West County, Sauvie Island is projected to have moderate growth in employment and the northern portion of the West Hills Rural Area is projected to have moderate growth in both employment and households.

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Comprehensive Plan

Figure 2A

Existing Household Density

Columbia County

Washington County

Clark County

Cornelius Pass Road

Skyline Boulevard

Reeder Road

Sauvie Island Rd

Gillihan Road

Germantown Road

Springville Road

Cornell Road

30

26

8

219

5

120

99E

405

84

Existing Housing Density / Housholds per Acre by TAZ

- 0.00 - 0.07
- 0.08 - 0.16
- 0.17 - 0.60
- 0.61 - 2.03
- 2.04 - 4.52
- Plan Areas
- County Boundaries

0 0.5 1 2 Miles

Prepared By:
Kittelson & Associates, Inc.

Date:
8/29/2016

Coordinate System:
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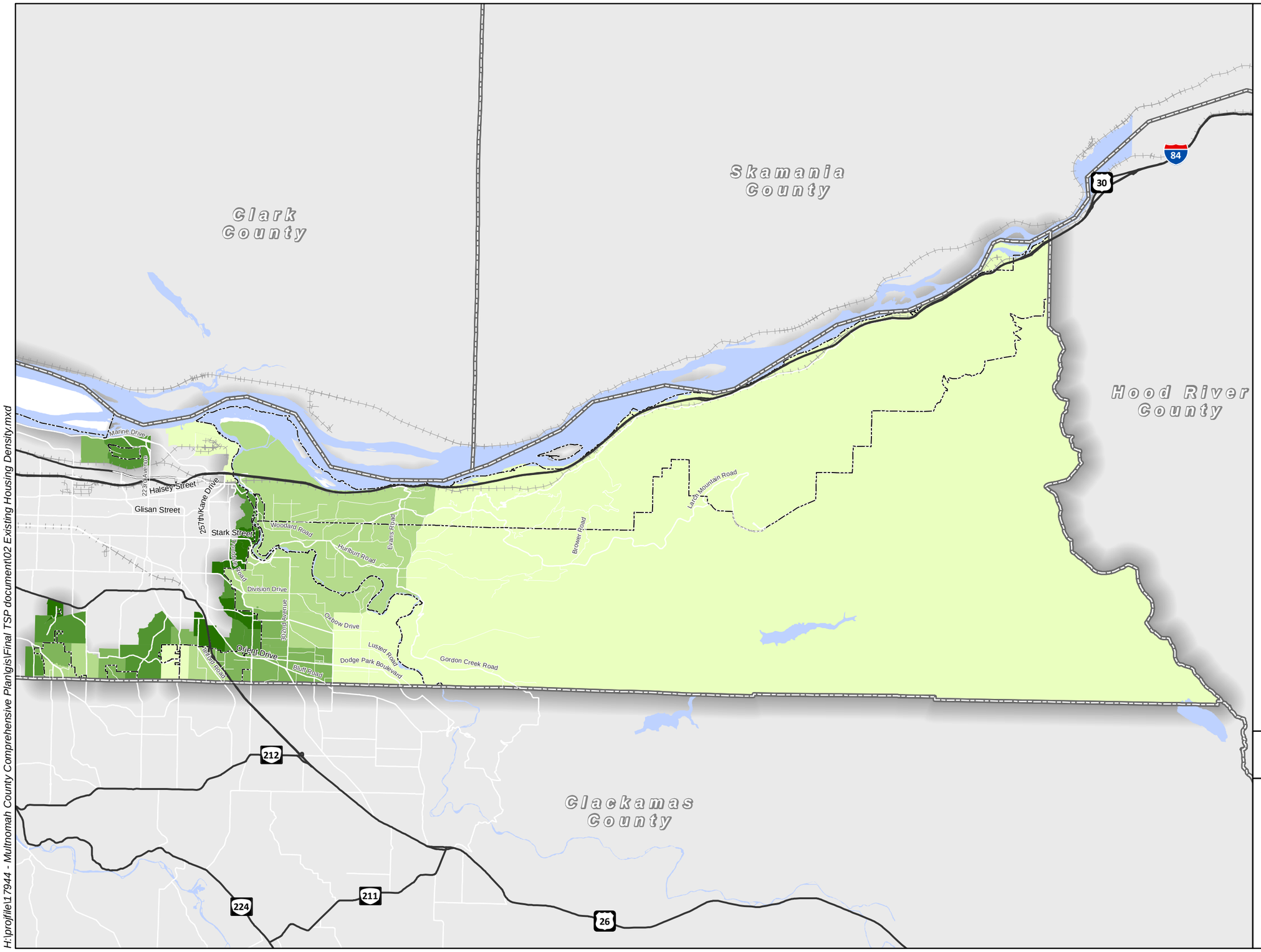
H:\profile\17944 - Multnomah County Comprehensive Plan\gis\Final TSP document\02 Existing Housing Density.mxd


Clark County
Skamania County
Hood River County
Clackamas County
84
30
212
211
224
26
Marine Drive
223rd Avenue
Halsey Street
Glisan Street
257th/Kane Drive
Stark Street
Woodard Road
Hurlburt Road
Evans Road
Brower Road
Larch Mountain Road
Palmblad Road
Division Drive
302nd Avenue
Oxbow Drive
Orient Drive
Lusted Road
Dodge Park Boulevard
Bluff Road
Gordon Creek Road
Multnomah County
Comprehensive Plan
Figure 2B
Existing Household Density
Existing Housing Density / Housholds per Acre by TAZ
0.00 - 0.07
0.08 - 0.16
0.17 - 0.60
0.61 - 2.03
2.04 - 4.52
Plan Areas
County Boundaries
0 1 2 4 Miles
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Land Use and Zoning

The majority of the rural areas of Multnomah County are zoned for agricultural and forest uses. Rural residential and single family residential makes up most of the rest of the lands with little commercial and industrial development in the rural areas. For further information see Appendix B.

Key Destinations and Community Centers

Many of the key destinations and community centers in the rural areas are schools. Sauvie Island has public beaches as well as farm lands that attract visitors with corn mazes, pumpkin patches, and fresh produce for sale. East County has a number of key destinations in National Forest, National Scenic Area and State parks including but not limited to recreation areas in the Mount Hood National Forest, Sandy River Delta Park, Multnomah Falls, Mt. Hood National Forest, and the Columbia River Gorge Scenic Area. Figures in Appendix B (4A and 4B) show key destinations and community centers in the study area.

STREET SYSTEM AND TRAFFIC ANALYSIS

Primary roadway facilities, their characteristics, and existing operational performance are summarized below for each of the study areas.

Roadway Jurisdiction

As shown in Figures 3A and 3B, all roadways in rural Multnomah County, except interstates, highways and the Historic Columbia River Highway, are operated and maintained by the county.. The state facilities within Multnomah County provide interstate, statewide, and regional connectivity. These facilities include Interstate 84 (I-84), Oregon Highway 30 (US 30), Historic Columbia River Highway through the Columbia River Gorge (travelling east from Sandy River), and a small section of Oregon Highway 26 (US 26). Highway 30 provides access to both the west and east sides of the county. I-84 serves the east area of the county.

Existing Traffic Volumes

Average annual daily traffic on roadway segments throughout the study area are shown in Figures 4A and 4B. As shown, the majority of the roadways carry less than 1,000 vehicles per day on average. As expected, the arterial roadways, such as Cornelius Pass Road, SE Foster Road and Troutdale Road carry higher volumes of traffic.

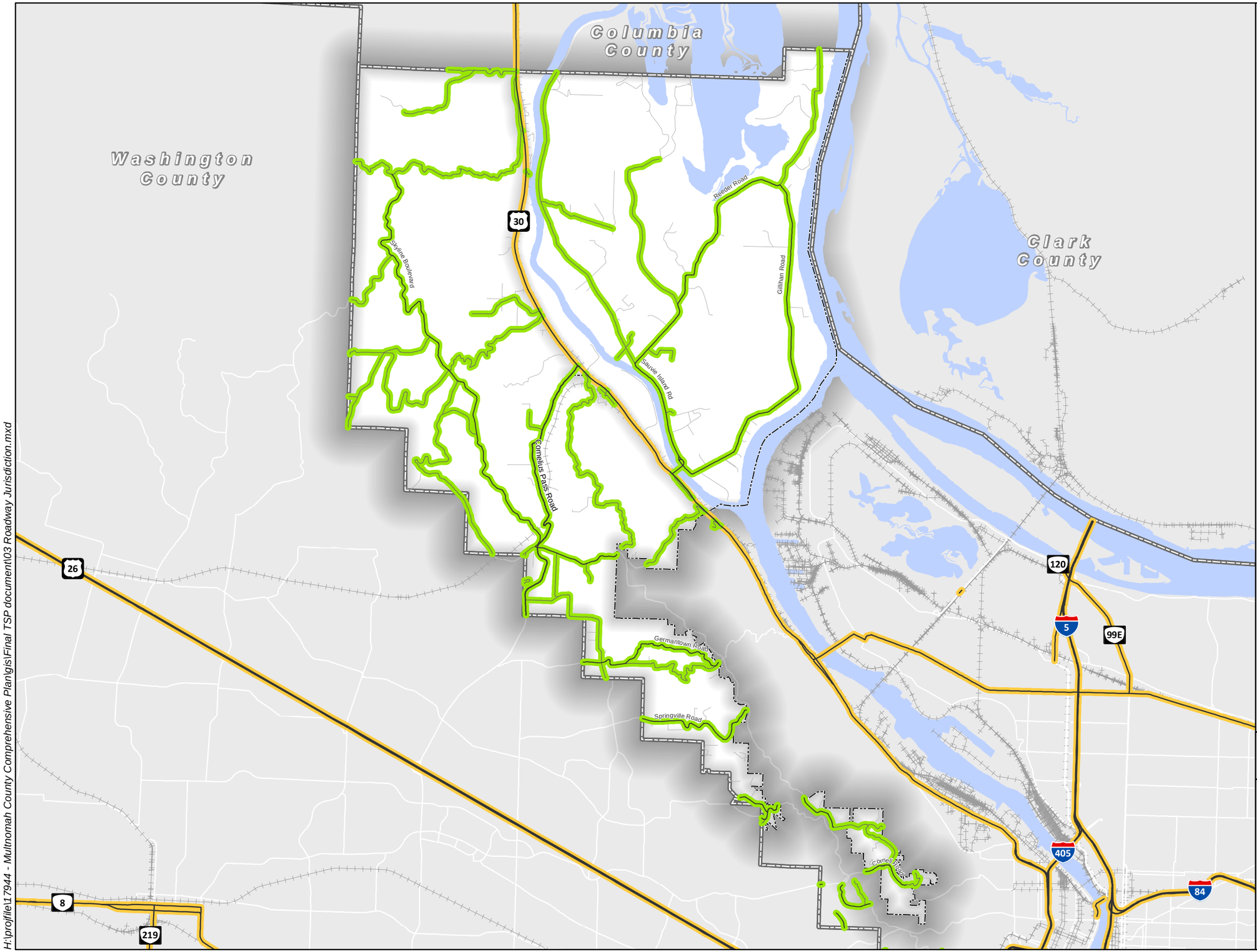
From the Sauvie Island and Multnomah Channel TSP update, average daily traffic volumes on most of the roadways throughout Sauvie Island are less than 3,000 vehicles per =. The popularity of the beaches, hunting and fishing areas, recreational cycling opportunities, seasonal festivals, and agri-tourism activities lead to significant fluctuations in average daily traffic volumes during the peak

seasons, typically occurring in the summer and fall. During these times, the Sauvie Island Road can have as many as 17,000 vehicles per day. The peak traffic conditions are a result of both seasonal all-day events (such as access to public beaches and pumpkin patches) as well as limited duration events (such as concerts and farm-to-table dinners).

ODOT records annual average daily traffic (AADT) volumes on all state highways. Traffic volumes on ODOT facilities in Multnomah County have generally followed the overall state trends related to decreases during the recession and an increase since 2011. Volumes on US 30/St. Helens Road through West County have gone down since 2006 and are still at levels lower than recorded in 2007. Overall growth between 2003 and 2013 has averaged to less than one percent per year on US 26 and I-84 in East County. Appendix B provides a table with more details on the historical AADT.

Future Traffic Volumes

ODOT provides information about future anticipated growth on all state facilities. A discussion of the future traffic volumes can be found in Appendix B. Due to regional population growth and continued housing development in adjacent urban areas, traffic volumes on rural County roads are anticipated to continue to increase.



Multnomah County
Comprehensive Plan

Figure 3A
Roadway Jurisdiction

- Multnomah County Roadways
- ODOT Roadways
- Local Roads (not maintained by county)
- Plan Areas
- County Boundaries

0 0.5 1 2 Miles

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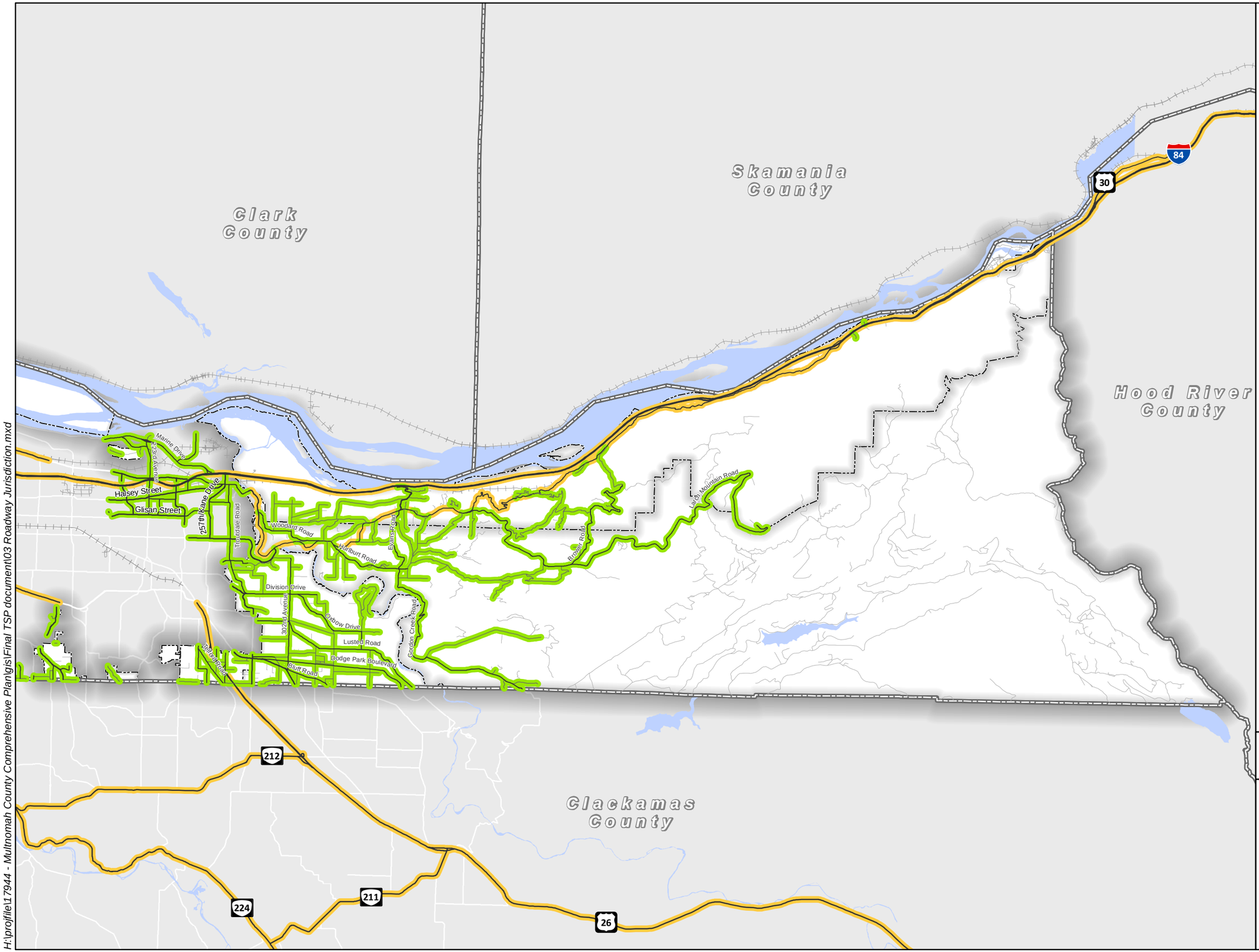
Multnomah County
Comprehensive Plan

Figure 3B
Roadway Jurisdiction



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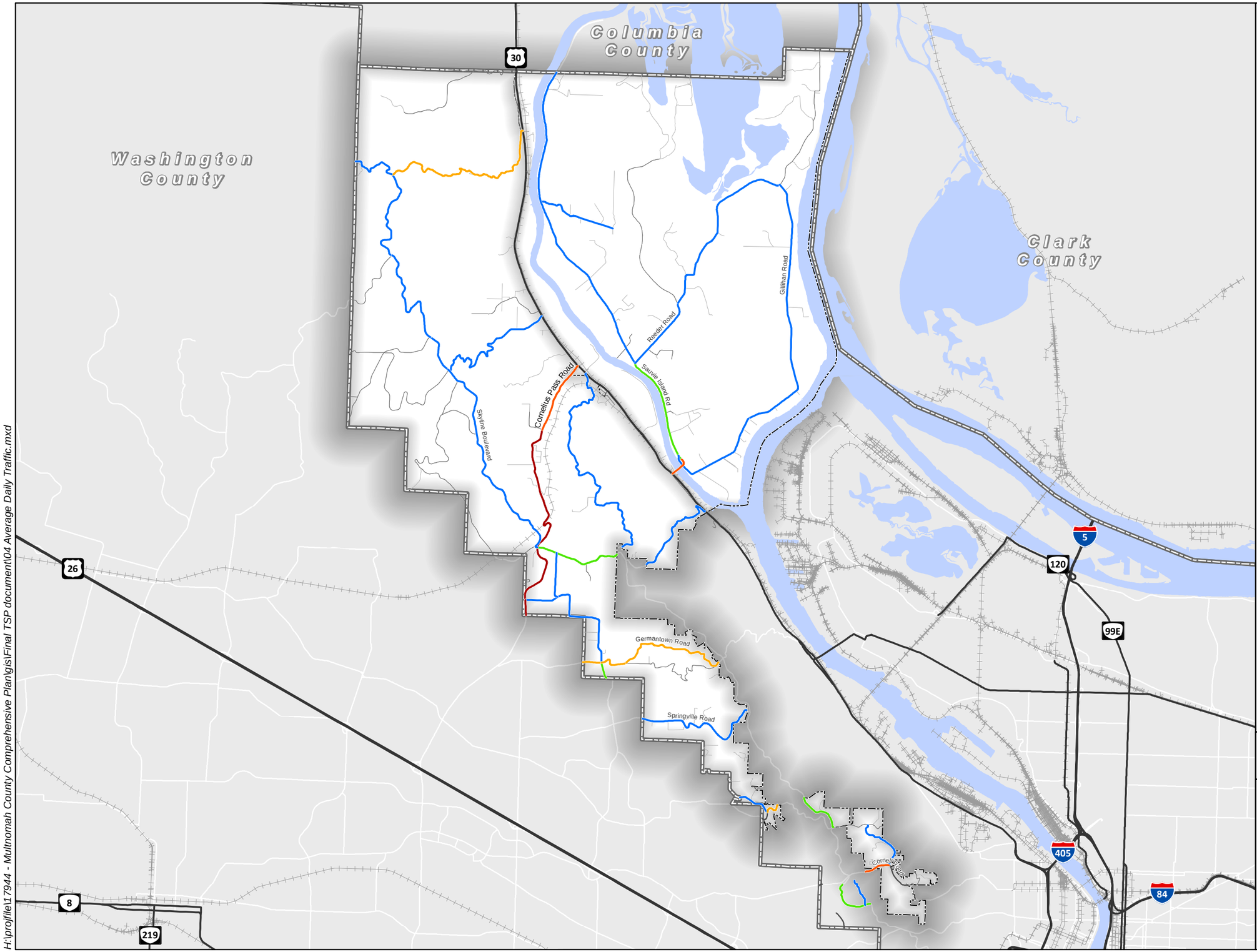

Multnomah County
Comprehensive Plan

Figure 4A
Average Daily Traffic

Average Daliy Traffic (records from 2006 to 2014)

- <1,5000
- 1,500 - 3,000
- 3,001 - 5,000
- 5,001 - 10,000
- >10,000
- Plan Areas
- County Boundaries

0 0.5 1 2 Miles

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H:\profile\17944 - Multnomah County Comprehensive Plan\gis\Final TSP document\04 Average Daily Traffic.mxd

Multnomah County
Comprehensive Plan

Figure 4B
Average Daily Traffic

Clark County
Skamania County
Hood River County
Clackamas County

Marine Drive
223rd Avenue
Halsey Street
Glisan Street
257th/Kane Drive
Stark Street
Troutdale Road
Division Drive
302nd Avenue
Orient Drive
Cherry Park Road
Bluff Road
Oxbow Drive
Dodge Park Boulevard
Lusted Road
Gordon Creek Road
Hurlburt Road
Woodard Road
Evans Road
Blower Road
Larch Mountain Road

84
30
212
224
211
26

Average Daliy Traffic (records from 2006 to 2014)

- <1,5000
- 1,500 - 3,000
- 3,001 - 5,000
- 5,001 - 10,000
- >10,000
- Plan Areas
- County Boundaries

0 1 2 4 Miles

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HISTORIC CRASH ANALYSIS

Crash data from the latest five years (January 1, 2009 through December 31, 2013) was obtained from ODOT for all State and County roadways within the study areas.

County Crash Patterns

A total of 1,403 crashes were reported in in the study areas between 2009 and 2013. Of the 1,403 crashes, 401 were reported on I-84.

Table 3 summarizes the reported crashes by severity. Half of the reported crashes involved an injury, and 24 crashes involved a fatality. Of the fatal crashes, 14 were reported as a fixed object crash. The second most common crash type reported for fatalities was head-on collisions. One fatality was the result of a collision between a pedestrian and motor vehicle. This crash occurred under dark light and wet road conditions. The report states the pedestrian was in the roadway illegally and wearing non-visible clothing. The majority of the fatal crashes occurred in clear weather, on dry roads, and in the daylight. Excessive speed was reported in 10 of the 24 fatal crashes.

Figures 5A and 5B provide the location of each of the recorded crashes in the study areas. As shown, many of the recorded crashes occurred along I-84 and US 30, as well as key arterials such as Cornelius Pass Road, Skyline Boulevard, Germantown Road, and Corbett Hill Road.

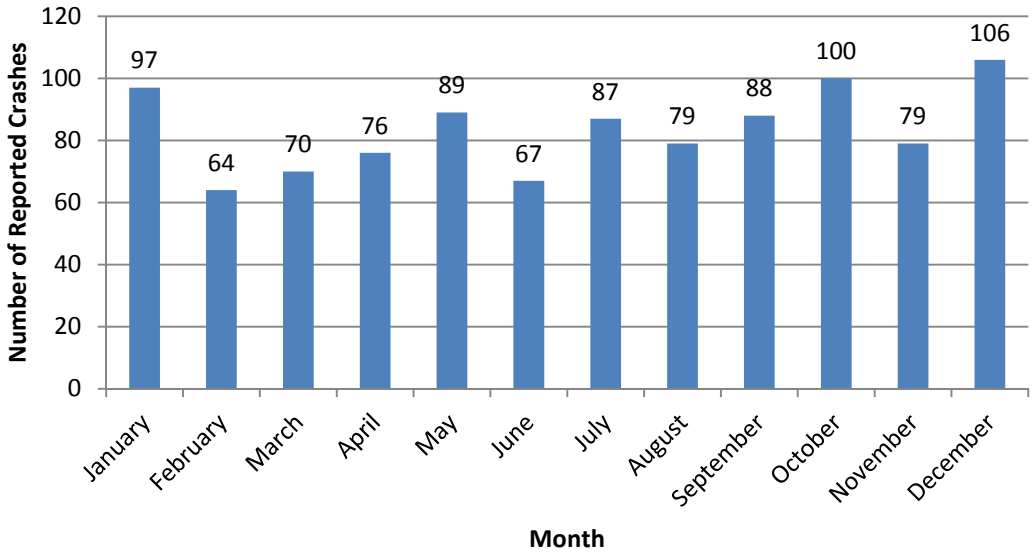
Table 3 Reported Crashes by Severity in Multnomah County Rural Areas (2009 – 2013)

	Crash Severity			Total
	Fatal	Injury	Property Damage Only	
Number of Reported Crashes	24	511	467	1,002
Percentage of Total Crashes	2%	51%	47%	100%

Seasonal Trends

To understand any possible weather and/or seasonal trends, Exhibit 1 shows the number of crashes reported by month over the five year period.

Exhibit 1 Reported Crashes by Month (2009-2013)



As shown in Exhibit 1, the highest crash frequency occurred during late fall winter months, from October through January. Winter months in Multnomah County can include inclement weather conditions producing wet, icy, and/or snowy conditions. Further review of crashes in October, November, December, and January (382 crashes) indicate that 60% (228 crashes) occurred on roadway surfaces that were wet, icy, or snow-covered. Additionally, 55% (210 crashes) occurred in dark, dawn, or dusk lighting conditions.

Crash Type Analysis

Over the study period, 54% of crashes (537 crashes) were single vehicle crashes including fixed object, overturn, and non-collision crashes. Speed was a contributing factor in one-third (327 crashes) of all crashes. Over 40% (409 crashes) occurred on roadway surfaces that were wet, icy, or snow-covered. Forty-two percent (417 crashes) occurred in dark, dawn, or dusk lighting conditions.

Four pedestrian crashes were reported in the study period with one resulting in a fatality. The fatality occurred in dark, rainy conditions. The report states the pedestrian was in the roadway illegally and wearing non-visible clothing. The pedestrian crashes occurred at the following locations:

- US 30 – 2,000 feet south of Watson Road
- Lusted Rd – 3,300 feet from Cottrell Road
- Hurlburt Rd – 260 feet east of Kimbley Rd (west access)
- Haines Road and Thompson Mill Road

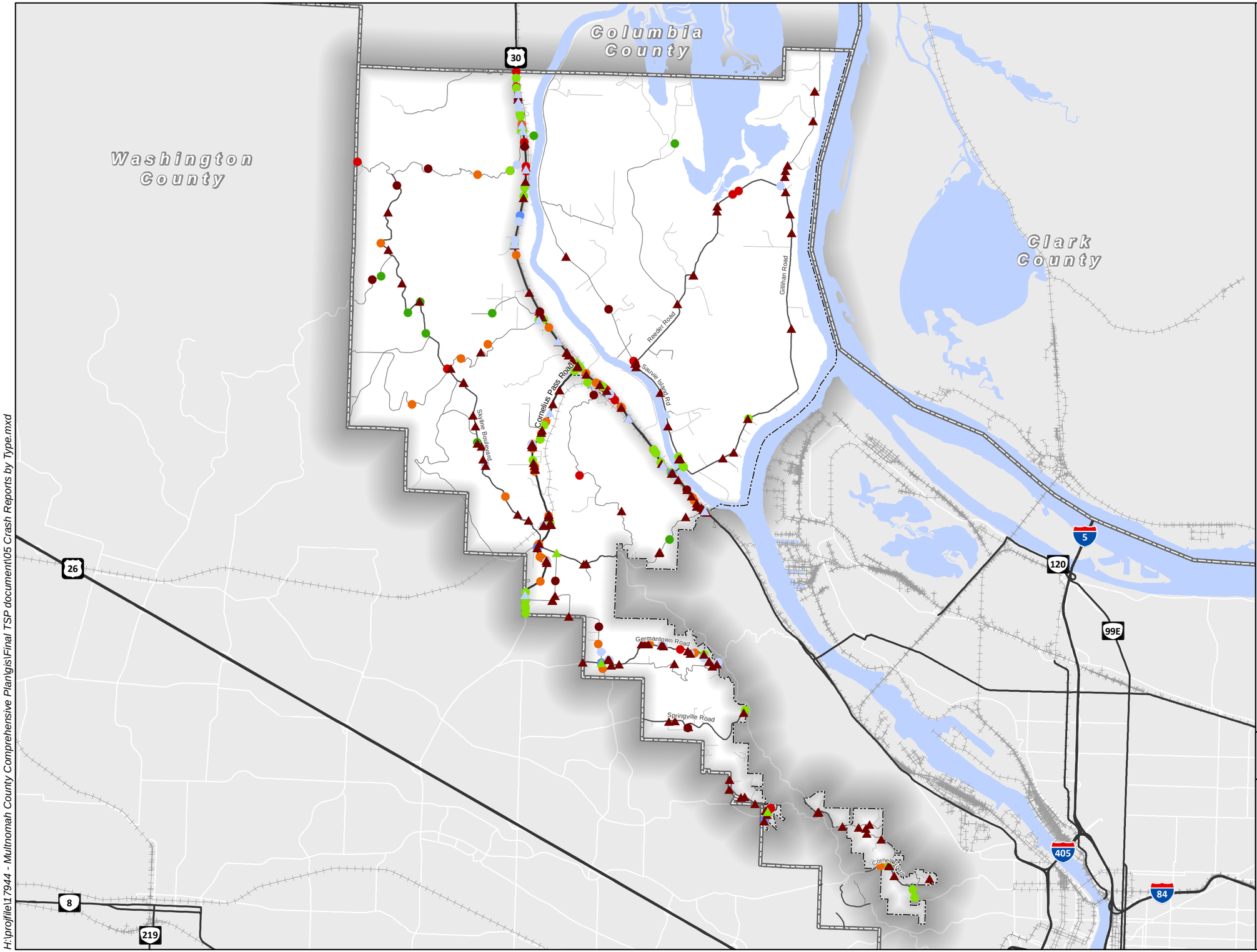
Eleven bicycle crashes were reported in the study period all resulting in non-fatal injuries. All but one crash occurred under clear weather conditions, dry road surface, and in the daylight. The majority (seven) of the crashes were attributed to not yielding to the right-of-way. The other causes were following too closely, non-motorist illegally in the roadway, and other improper driving. The bicycle crashes occurred at the following locations:

- Skyline Boulevard and Brooks Road
- Laidlaw Road and Thompson Road – two crashes occurred here
- HCRH and Crown Point Highway – two crashes occurred here
- Foster Road and Richey Road
- Lusted Road 2,000 ft north of Dodge Park Boulevard
- Lusted Road at Sam Barlow High School
- HCRH – 400 feet west of Lucas Road
- Dodge Park Boulevard and Short Road
- HCRH and Evans Road

Multnomah County
Comprehensive Plan

Figure 5A

Crash Reports by Type (Jan 2009 to March 2014)



Crash Type

- Animal
- Bicycle
- Pedestrian
- Fixed Object
- Head-On
- Angle
- Rear-End
- Run Off The Road
- Sideswipe
- Turning
- Other
- Plan Areas
- County Boundaries

0 0.5 1 2 Miles

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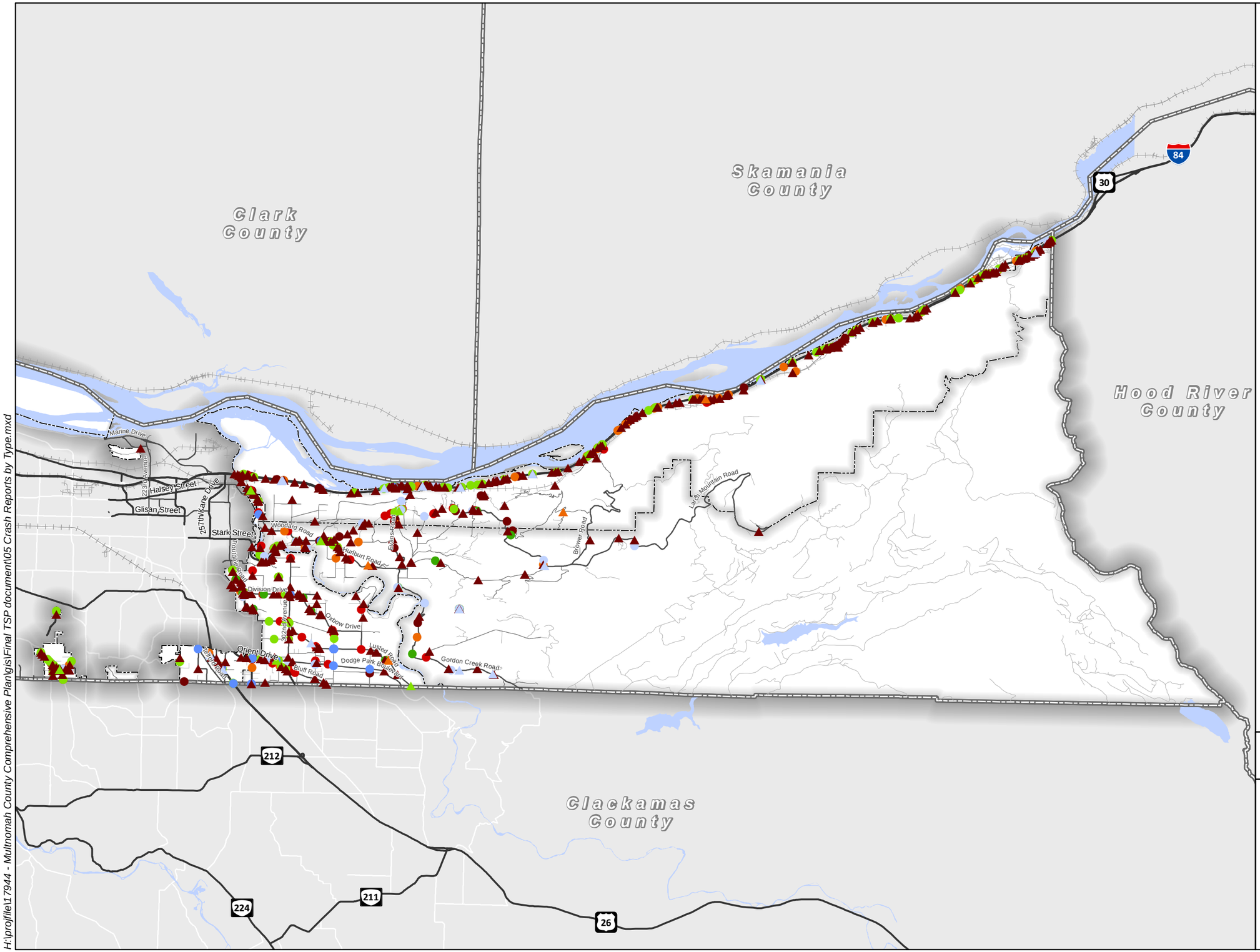
Source: Oregon Department of Transportation Crash Reports from January 2009 to March 2014

H:\profile\17944 - Multnomah County Comprehensive Plan\gis\Final TSP document\05 Crash Reports by Type.mxd



Multnomah County Comprehensive Plan

Figure 5B

Crash Reports by Type
(Jan 2009 to March 2014)

Crash Type

- Animal
- Bicycle
- Pedestrian
- Fixed Object
- Head-On
- Angle
- Rear-End
- Run Off The Road
- Sideswipe
- Turning
- Other
- Plan Areas
- County Boundaries

0 1 2 4 Miles

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H:\projfile\17944 - Multnomah County Comprehensive Plan\gis\Final TSP document\05 Crash Reports by Type.mxd

Source: Oregon Department of Transportation Crash Reports from January 2009 to March 2014

Intersection and Segment Crash Analysis

In addition to the countywide data, ten locations, four intersections and six segments within the study areas, were analyzed and compared to statewide averages for similar facilities, when possible.

Intersection Crash Rates

Reported crashes at four key intersections are summarized in Table 4. Intersection exposure was measured in terms of total entering vehicles (TEV), derived from the link volumes data. To provide a basis of comparison, ODOT identifies 90th percentile crash rates for similar facilities in the Analysis Procedures Manual, (Reference 1). As shown, all of the study intersections reported higher crash rates than ODOT's 90th percentile crash rates for the respective intersection type.

Table 4 Reported Crashes at Study Intersections

Intersection ID and Name	# of Crashes	TEV (in millions)	Crash Rate	90th Percentile Crash Rates	Crash Type						Severity		
					Angle	Rear-End	Turning	Ped/Bike	Fixed-Object	Other	PDO	Injury	Fatality
A - Reeder Road/Sauvie Island Road	6	4.95	1.21	0.475	0	0	2	0	4	0	3	2	1
B - Foster Road/172nd Avenue	25	17.82	1.40	0.475	0	14	8	0	2	1	6	19	0
C - Foster Road/Richey Road	10	17.82	0.56	0.475	1	2	1	0	4	2	5	5	0
D - Orient Drive/282nd Avenue	17	13.78	1.23	0.579	3	6	6	0	2	0	9	8	0

[1]TEV = Total entering vehicles
[2]PDO = Property damage only
[3]Crash Rate = Crashes per million entering vehicles

One fatality occurred at the study intersections above. It was a single-vehicle, fixed-object crash that occurred at the Reeder Road/Sauvie Island Road intersection. It occurred in the rain, with wet road surface, and in the dark. Speeds too fast for conditions were a contributing factor.

Segment Crash Rates

Reported crashes along study roadway segments are summarized in Table 5. Exposure on the segments was measured based on average daily traffic (ADT) volumes from available link volume data. ODOT publishes statewide average roadway segment crash rates for the past five years for urban and rural areas, by functional classification. The statewide average roadway segment crash rates for rural minor collectors are provided in Table 5 for comparison to calculated crash rates for highways in the study areas. As shown, all of the study segments reported higher crash rate than the state average crash rates for the respective functional classification.

Table 5 Reported Crashes at Study Roadway Segments

ID	Segment Name	Segment Boundaries	Segment Length (miles)	Number of Crashes	ADT	Crash Rate (2009 – 2013 average)	State Average	Crash Type		Severity		
								Fixed-Object	Other	PDO	Injury	Fatality
E	Germantown Road	Between Skyline Road and Old Germantown Road	2.0	25	4800	2.85	1.30	14	11	12	11	2
F	Skyline Boulevard	From ½ miles north of Rock Creek Road to ¾ miles south of Rock Creek Road	1.25	8	1340	3.27	1.30	6	2	1	7	0
G	Corbett Hill Road	Between I-84 and Historic Columbia River Highway	1.4	29	2520	6.32	0.71	6	23	12	17	0
H	Lusted Road	¼ of a mile east starting 1/3 of a mile east of Cottrell Road	0.25	7	650	5.90	1.30	4	3	3	3	1
I	Hurlburt Road	From Springdale School to Kimbley Road (East)	1.5	11	1490	4.05	1.30	5	6	4	7	0
J	Stark Street	Between 36th Street and Historic Columbia River Highway	1.3	21	5410	2.13	0.71	12	9	8	11	2

Findings from the study intersection and segment crash analysis indicate the following:

- Corbett Hill Road, which is an arterial connecting to I-84, has the highest crash frequency among the study segments.
- The intersection of Reeder Road and Sauvie Island Road has the highest crash frequency among the study intersection.
- Over 46% of reported crashes along the studied intersections and segments areas occurred on a wet, icy, or snowy roadway.
- Over a third (52 crashes) of the crashes recorded at the study intersections and segments indicated speeding or speed too fast for conditions as a contributing cause.
- Of the six fatal crashes on the study segments, five were fixed object crashes with four of attributing speed too fast for conditions or speeding as a contributing factor. The other fatal crash involved a pedestrian who was in the roadway illegally.

- Four pedestrian and bicycle crashes were reported at the study intersections and segments throughout the five year analysis period, one of which was fatal and described above. Three of the four crashes occurred with clear weather conditions, on dry roadways, in the daylight. The two reported causes were "did not yield right-of-way" and "non-motorist illegally in roadway."
- Among the injury crashes, the majority were single-vehicle crashes. Speed was a contributing factor in approximately half of the reported injury crashes. Over half of the injury crashes occurred with some sort of precipitation on the roadway.

Both the County's policies and stakeholder feedback identify the importance of improving safety for all transportation system users in Multnomah County.

Crash data from 2007 through 2013 was obtained from ODOT and reviewed to establish a baseline for identifying potential safety-related improvements. This review revealed the following:

- There were four pedestrian crashes reported in the study area. One of these crashes resulted in a fatality.
- There were eleven bicycle crashes reported in the study area. All resulted in non-fatal injuries.
- 54% of crashes =were reported as fixed object/run off the road/overturn single vehicle crashes.
- There were 24 recorded fatal crashes.
    - 14 of these crashes were reported as a fixed object crash.
    - The second most common crash type reported for fatalities was head-on collisions.
    - Excessive speed was reported for 10 of the fatality crashes.
- Areas with a pattern of crashes include:
    - I-84
    - US 30
    - Cornelius Pass Road
    - Skyline Boulevard
    - Germantown Road
    - Corbett Hill Road
    - Reeder Road/Sauvie Island Road intersection

Stakeholder interviews and reviewed documents identified other safety concerns related to the multiple crossings of the railroad that runs north-south between US 30 and the Multnomah Channel on Sauvie Island. These concerns primarily relate to the lack of active crossing measures, such as gates and flashing lights at these crossings. These interviews also identified "perceived safety" as an issue that

concern community members. The discussion revolved around near misses, perceived unsafe driving conditions and behavior, and other factors that cannot be recorded in crash reports and statistics.

Additional road segments and intersections were identified as areas that could benefit from a separate safety study. These areas include:

- US 30
- Skyline Boulevard
- Lusted Road
- Corbett Hill Road
- Hurlburt Road
- Gillihan Road/Reeder Road intersection
- Sauvie Island Road/Reeder Road intersection

PUBLIC TRANSPORTATION SYSTEM

Three transit agencies serve Multnomah County's rural areas, including TriMet, Columbia County Rider, and Sandy Area Metro. The highlights of this service include:

- TriMet primarily serves Portland Metro urban areas but has transit stops located near the perimeter of several of the County's rural areas including the West Hills, Sauvie Island, Troutdale and Gresham.
- TriMet has a Park-and-Ride located on Sauvie Island and several in Gresham that could serve residents of East County.
- Columbia County Rider has a route along Highway 30 but it does not currently stop on Sauvie Island but may in the future.
- Sandy Area Metro has a route along Highway 26 in the West of Sandy River area.

The County's rural areas are not served by fixed route transit; however, fixed route transit and park-and-ride facilities are provided at the urban fringes to help provide access to commuters from rural areas.

Figures in Appendix B (16 A and 16B) show the transit routes, stops, centers, and park n' ride locations in and near the rural areas.

RAIL

The Portland and Western railroad has two routes through the west side of the County, one going up the West Hills and the other along Highway 30. Union Pacific has a route on the east side of the County that follows I-84. The majority of the railroad crossings throughout the rural areas are private crossings

(crossings of private roads, driveways, and accesses). There are two public County owned crossings in the Multnomah Channel area; one at-grade crossing located on Lower Rocky Point Road on the east side of Highway 30 and one grade-separated crossing on NW McNamee Road. Figures in Appendix 2 (14A and 14B) depict the railroads traversing Multnomah County as well as the locations of public and private railroad crossings in the rural areas.

AIR TRANSPORTATION SYSTEM

The Sandy River Airport is the only public airport located in the study areas. In addition, Lehman Airport is a private airport located three miles southeast of Corbett. Troutdale Airport also provides service in the area located ten miles east of the central business district of Portland. Portland International Airport serves most air passenger and freight transportation needs for Multnomah County.

WATER

The Columbia River and Willamette River are both used currently to transport goods locally and internationally. Water transport remains is a significant resource in Multnomah County due to the number of existing and potential ports along its length. This option for transporting freight reduces the number of trucks and trains needed on land to support the county's economy and has a significant impact on the transportation system.

EXISTING CONDITIONS AND FUTURE NEEDS SUMMARY

The key highlights of the existing and future conditions are summarized below.

- The primary transportation issue in Multnomah County's rural areas is safety. Identifying and prioritizing safety improvements will be a primary objective of the TSP Update.
- General County-wide trends indicate that some low-cost systemic treatments such as shoulder widening in select locations and installation of centerline and shoulder rumble strips may be effective on County facilities in addition to treatments addressing speed and improving intersections with poor geometry.
- Paved shoulders serve multiple functions in rural areas. They increase safety for vehicles, provide space for farm equipment and emergency pull-offs, but they also act as pedestrian and bicycle facilities. The needs and priorities for shoulder improvements for vehicle safety should also be coordinated with additional considerations below and balanced with potential environmental and wildlife impacts.
- Despite the lack of shoulder bikeways, many of the County's rural roadways are popular cycling routes. A desired network and priorities of shoulder bikeway facilities for the purpose of transportation and tourism should be included in the TSP Update.
- The County's rural areas are not served by fixed route transit; however, fixed route transit and park-and-ride facilities are provided at the urban fringes to help provide access to commuters from rural

areas. Access to these park-and-rides for pedestrians and bicycles should be considered in the TSP Update.

- Multnomah County has a number of designated freight routes extending into the rural areas from the ODOT freight routes. These should be considered in the prioritization of shoulder improvements.
- Multnomah County should continue to support the movement of freight via air, rail, and water through ensuring access to intermodal facilities to reduce the number of trucks on the roadways.

- Population and employment in the rural areas is expected to grow at approximately 3 – 3.5 percent per year. Although not projected to result in traffic congestion in the rural areas, concerns about increasing traffic volumes on rural road remains. Additionally, this growth will continue to have impacts on safety and conflicts between different modes.

Section 3
Range of Solutions

RANGE OF SOLUTIONS

Solutions to address the primary existing and future Multnomah County transportation issues and needs in the rural areas fall into four general categories: bicycle and pedestrian facilities, safety, signage and signal treatments, and transportation demand management.

Table 6 summarizes the solutions that are included in the TSP. The following pages provide additional information on each of the solutions.

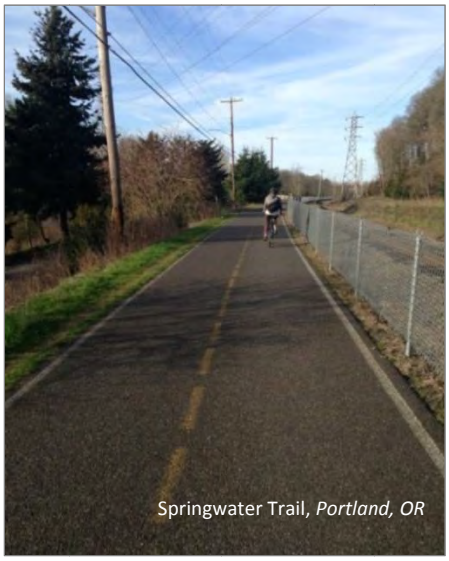
Table 6 Potential Solutions Summary Table

Reference Number	Potential Solutions
Bicycle and Pedestrian Facilities	
BPF-1	Multi-use path
BPF-2	Advisory bike lane
BPF-3	Buffered shoulder bikeway
BPF-4	Shoulder bikeway
BPF-5	Shared lane roadways
BPF-6	Bicycle pullout
BPF-7	Bicycle climbing lane
BPF-8	Bike map
BPF-9	Pedestrian shoulder
BPF-10	Pedestrian path (sidepath)
BPF-11	Gravel shoulder
Safety	
SA-1	Rumble strips
SA-2	Increased shoulder width
SA-3	Curve improvements
SA-4	Rural intersection improvements
SA-5	Railroad crossing improvements
Signage and Signal Treatments	
SI-1	Wayfinding signage
SI-2	Warning/advisory signs
SI-3	Speed limit signs
SI-4	Signal Controller/Timing Plans
Transportation Demand Management	
D-1	User-generated parking information
D-2	Real-time parking information
D-3	Pricing parking permit
D-4	Parking enforcement
D-5	Park-n-ride lots
D-6	Shuttle service
D-7	Event permit calendar
D-8	Event-based “TDM” plan
D-9	User fees/congestion pricing
D-10	Flexible work time/telecommuting

The following pages serve as a toolbox of information on the four categories of solutions in Table 6. Each solution has one page describing the solution, pros, cons, applicability to the TSP area, and other information.

Bicycle and Pedestrian Facilities

MULTI-USE PATH


Springwater Trail, *Portland, OR*


Orlando, FL

Multi-use paths are paved, bi-directional trails separated from roadways that serve both pedestrians and bicyclists. Multi-use paths increase the safety and comfort level of the user. They play an integral role in recreation, commuting, and accessibility due to their appeal to users of all ages and skill levels.

TSP Area Applicability

Several roadways in Multnomah County could benefit from a multi-use path including Burlington Northern Trial in the West Hills and the main loop road on Sauvie Island that consists of Sauvie Island Road, Reeder Road, and Gillihan Loop Road. Multi-use paths would improve accessibility for residents and increase safety for all users including recreational cyclists.

Pros

- Provides facility for both pedestrians and bicyclists in less space than separated facilities.
- Providing separation from motor vehicles can attract pedestrians and cyclists of all ages and abilities.
- Would improve accessibility for residents and increase safety for all users including recreational cyclists.

Cons

- May result in conflicts between modes in areas with frequent crossings or driveways.
- May result in conflicts between bicyclists and pedestrians.
- When parallel to roadways, the path must be buffered from motorists which requires substantial right-of-way.
- Speed differentials between more experienced cyclists and slower cyclists and pedestrians can cause conflicts on a shared facility.

Design Considerations

- Best suited in areas where roadway crossings can be minimized (such as parallel to travel barriers such as highways, railroad tracks, rivers, shorelines, natural areas, etc.). High-visibility treatments are needed at path crossings.
- Can be parallel to a roadway or on its own right-of-way.
- A minimum width of 10 feet is recommended for low-pedestrian/bicycle-traffic contexts and would be appropriate for some areas of the county; 12 to 20 feet should be considered in areas with moderate to high levels of bicycle and pedestrian traffic such as the Sauvie Island loop.
- Pavement markings can be used to indicate separate space for pedestrian and bicycle travel.
- May need right-of-way acquisition and levee restrictions may alter design and alignment.
- Permeable paving options could help minimize surface water runoff and be compatible with the rural character of the area.

Complementary Strategies

- Bike map, Wayfinding signage

ADVISORY BIKE LANE

Numansdorp, The Netherlands

Hanover, NH
Photo: Danny Kim, *The Dartmouth*

Hanover, NH
Photo: Danny Kim, *The Dartmouth*

Advisory bike lanes, also known as "suggestion lanes," are bicycle lanes that motor vehicles can use to pass oncoming motor vehicles after yielding to bicyclists. Advisory bicycle lanes are used in combination with a single center lane (without a centerline) for bi-directional motor vehicle travel on relatively low-volume streets.

TSP Area Applicability

This treatment is applicable to streets with less than 6,000 average daily motorized traffic (ADT) that do not have sufficient width for dedicated bicycle-only facilities. Most roadways in the rural areas of Multnomah County have annual average ADT below 3,000 with exceptions for major roadways such as Cornelius Pass Road and Germantown Road. Special considerations should be made for roadways on Sauvie Island due to seasonal traffic peaks which result in ADT up to 17,000 vehicles in a day on Sauvie Island Road. This treatment could be suitable on some Sauvie Island roads as well as other roads in east and west county that have relatively low traffic volumes and that are popular cycling routes.

Pros

- Provides striped bicycle facility on roadways with very limited right-of-way or pavement width.
- Encourages slower motor vehicle speeds and motorists yielding to bicyclists.
- Inexpensive treatment consisting of only signing and striping.

Cons

- Motorists may not initially understand advisory lanes due to limited applications in the US to date; education would be required.
- Does not provide physical protection from vehicles and may not attract bicyclists of all levels.
- Does not improve pedestrian environment.
- No US design guidelines available.

Design Considerations

- Advisory bike lanes can be striped as 5-7 foot lanes with a single center motorized vehicle lane of 10 to 18 feet.
- Explanatory signage may be helpful in US contexts to communicate to motorists that they must yield to bicyclists before passing oncoming vehicles.

Complementary Strategies

- Bike map
- Wayfinding
- Speed limit signs

BUFFERED SHOULDER BIKEWAY

Riverside Boulevard
Bend, OR

http://brisbaneca.blogspot.com
/2008_12_01_archive.html
Brisbane, CA

Buffered bicycle lanes or buffered shoulder bikeways are on-street lanes that include an additional striped buffer of typically 2-3 feet between the bicycle lane and the vehicle travel lane and/or between the bicycle lane and the vehicle parking lane.

TSP Area Applicability

This treatment is applicable to streets that are long-distance links within and between communities. Any segment of the bicycle network with moderate vehicle speeds or volumes and sufficient pavement width to provide a buffer can be considered within the study area.

Pros

- A parking-edge buffer on streets with on-street parking can reduce the likelihood of "dooring."
- Increased separation from motor vehicles (over standard bicycle lanes) can increase bicyclist comfort.

Cons

- Does not provide physical protection and therefore may not attract bicyclists of all levels.
- The additional width provided by the buffer may invite motorists to illegally park in the lane if not adequately signed and enforced.

Design Considerations

- Typical buffer width is 2-3 feet, in addition to standard bicycle lane width of 5-6 feet, but a combined width of 6 feet is acceptable.
- Green pavement markings or striping can add visibility and awareness in "conflict areas" or intersections where bicycle and vehicle travel paths cross.
- Buffer space can have markings or rumble strips to deter vehicles from traveling or parking in the space.

Complementary Strategies

- Bike map
- Wayfinding
- Speed limit signs

SHOULDER BIKEWAY

Tucson, AZ


Tucson, AZ


Boise, ID

A shoulder bikeway can serve as a bicycle and pedestrian facility that provides space separated from motor vehicle traffic in rural areas.

TSP Area Applicability

Shoulders bikeways could be applied to most of Multnomah County's rural roadways but would require special permits to be constructed on roadways on the levee.

Pros

- Provides a space separated from motorists.
- Requires less right-of-way than a separated multi-use path.
- Standard treatment for Multnomah County and equipment for maintenance available.

Cons

- Does not provide physical protection from vehicles and may not be comfortable for all users.
- Shoulders serving other uses, such as disabled vehicles, farm equipment, or pedestrians may require bicyclists and pedestrians to use travel lanes.
- Potential impacts to wildlife crossings and rural character.

Design Considerations

- A 6-foot width is preferred to accommodate bicycle and pedestrian travel, with a 3-foot minimum in constrained areas. Greater widths can be used in higher-speed locations.
- Rumble strips or profiled striping can be used to enhance safety and minimize motorists encroaching on the shoulder in areas without significant agricultural activity.
- May require right-of-way acquisition.
- On Sauvie Island, levee restrictions may alter design or prohibit construction.

Complementary Strategies

- Bike map
- Wayfinding

SHARED LANE ROADWAYS

Cornell Road, *Portland, OR*


Clackamas County, OR

Shared lane roadways are those where motorists and cyclists share the same travel lanes. Shared lane roadways that are part of a designated bicycle network may include shared lane markings ("sharrows") or signage to indicate the legal presence of bicyclists in the travel lane.

TSP Area Applicability

A majority of the roadways in rural Multnomah County are currently shared facilities. Posting "Bikes on Roadway" signs would indicate to road users that bicyclists may be present and are on the roadway.

Pros

- Allows for bicycle travel when other treatments are not feasible.
- Low- to no-cost.

Cons

- Does not provide any separation from vehicles.
- Without additional traffic-calming treatments, it is likely to only attract confident bicyclists.
- Does not improve pedestrian environment.

Design Considerations

- Provide guidance signage to alert drivers of the shared road. See warning/advisory signs section.
- Educate drivers on the rules of sharing the road.
- Increase signage and pavement markings.

Complementary Strategies

- Pedestrian path
- Bike map
- Bicycle pullouts
- Bicycle climbing lanes

BICYCLE PULLOUTS


Boise, ID

Bicycle pullouts are areas provided along shared lane roadways to allow cyclists to move out of the vehicle travel lane to stop or allow faster-moving vehicles to pass. They include short pullouts to provide cyclists a place to stop and long pullouts that would allow cyclists to keep traveling while allowing vehilces to pass.

TSP Area Applicability

Bicycle pullouts can be applied to any roadway without shoulder bikeways or other bicycle treatments. They are intended to be provided on designated bikeways as lower impact alternative to continuous shoulder bikeways in constrained areas. They are most applicable on uphill roadways or long stretches of roadways without passing opportunities for vehicles.

Pros

- Provides a space separated from motorists.
- Creates opportunities for vehicles to pass bicyclists on the roadway.
- Minimizes impacts to property, wildlife, and rural character of roadway.

Cons

- Requires right of way.
- Does not provide a continuous bikeway.

Design Considerations

- A 6-foot width is preferred to accommodate bicycle travel, with a 4-foot minimum in constrained areas. Greater widths can be used in higher-speed locations.
- May require right-of-way acquisition.
- Signage needed to require bicyclists to use pullouts.
- Pavement has to be smooth and maintained and/or swept regularly to ensure usage.
- Should be a suitable length to provide time for vehicles to pass (200 feet or more) if designed as a passing area rather than stopping location.

Complementary Strategies

- Paved Shoulder
- Shared lane roadways
- Bike map
- Wayfinding

BICYCLE CLIMBING LANES

A bicycle climbing lane consists of a bicycle lane on one side of a roadway in the uphill direction and a shared lane on the downhill side. It allows bicyclists to travel at slower speeds when going uphill without interfering with vehicle travel.

TSP Area Applicability

Bicycle climbing lanes can be applied to any roadway in the study and should be considered on designated as a lower impact alternative to shoulder bikeways in both directions in constrained areas.

Pros

- Provides a space separated from motorists for bicyclists traveling slower uphill.
- The pavement markings help indicate proper bicycle direction on both sides of the street.
- Requires less right of way than providing a bicycle lane or shoulder bikeway on both sides of the street.

Cons

- Does not provide physical protection from vehicles and may not be comfortable for all users on the downhill side.

Design Considerations

- May require right-of-way acquisition.
- Provide guidance signage to alert drivers of the shared road. See warning/advisory signs section.
- Educate drivers on the rules of sharing the road.
- Increase signage and pavement markings.
- Typical shoulder bikeway width is 6 feet, with 4-5 feet in constrained locations. A minimum 3-foot width can be used on constrained segments that are not principal arterials.
- Green pavement markings or striping can add visibility and awareness in “conflict areas” or intersections where bicycle and vehicle travel paths cross.

Complementary Strategies

- Shared lane roadways
- Bicycle Pullouts
- Bike map, Wayfinding
- Rumble strips

BIKE MAP

Source: FMATS Bike Map

Bike maps generally include the type of bicycle facilities available as well as destinations and other useful information within a defined area.

TSP Area Applicability

- Bike maps can provide guidance to infrequent cyclists regarding potential areas of interest such as types and locations of recreational activities, bike parking locations, restrooms, and access to drinking water.
- Could be privately funded by bike friendly businesses.

Pros

- Provides valuable information to bicyclists.
- Reduces trespassing.
- Map is portable and could also be available electronically.

Cons

- Cost of production and regular updates to ensure information remains relevant.

Complementary Strategies

- Multi-use paths
- Advisory bike lanes
- Buffered shoulder bikeways
- Paved shoulder
- Shared lane roadways
- Bicycle pullouts
- Bicycle climbing lanes
- Park-N-Ride Lots

PEDESTRIAN SHOULDER


SE Powell Blvd
Portland, OR


Fern Street
Tigard, *OR*

A pedestrian shoulder facility provides access for pedestrians on a hard surface in rural areas where sidewalks are not present.

TSP Area Applicability

Paved shoulders can be applied to any roadway in the study area but is most suited to roadways with low volumes but that have pedestrian demand.

Pros

- Provides a space separated from motorists.
- Requires less right-of-way than a separated multi-use path.
- More cost-effective than installing sidewalks.

Cons

- Does not provide physical protection from vehicles and may not be comfortable for all users.
- May be used by cyclists in both directions and conflict with pedestrians.
- Shoulders serving other uses, such as disabled vehicles or farm equipment may require bicyclists and pedestrians to use travel lanes.

Design Considerations

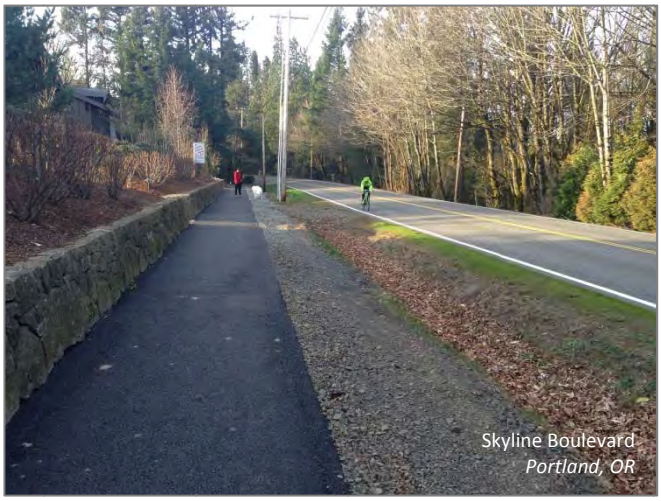
- A 6-foot width is preferred to accommodate bicycle and pedestrian travel, with a 4-foot minimum in constrained areas. Greater widths can be used in higher-speed locations.
- Rumble strips or profiled striping can be used to enhance safety and minimize motorists encroaching on the shoulder.
- May require right-of-way acquisition.

Complementary Strategies

- Rumble Strips

PEDESTRIAN PATH (SIDEPATH)


Skyline Boulevard
Portland, OR


Skyline Boulevard
Portland, OR


SW 121st Ave
Tigard, OR

A pedestrian path is a hard-surface path adjacent to the roadway in lieu of a sidewalk in areas where other bicycle facilities exist or bicylists share the roadway. While similar to a multi-use path, pedestrian paths are narrower in width and generally do not invite bicycle travel.

TSP Area Applicability

Pedestrian paths can be applied to any constrained roadways in the study area where sidewalks are not present and multi-use paths cannot be accommodated.

Pros

- Provides a hard surface for pedestrians buffered from the roadway.
- Requires less right-of-way than a multi-use path.
- Lower cost than construction of a full sidewalk with curb and gutter.

Cons

- May also attract bicyclists, creating the potential for conflicts between pedestrians and bicyclists.
- Requires right-of-way.

Design Considerations

- Typically 5- to 8-foot wide asphalt surface.
- Pedestrian paths are typically separated from the roadway by a gravel or vegetated buffer instead of a curb and gutter.
- Should follow ADA standards to allow for universal access.
- Though not intended for bicyclists, pedestrian paths may attract bicyclists if a separate bicycle facility is not provided.

Complementary Strategies

- Shoulder Bikeways
- Bicycle Pullouts
- Bicycle Climbing Lanes

GRAVEL SHOULDER

A gravel shoulder facility can provide space for a pedestrian to walk on a soft surface, with some separation from motorists, in areas where sidewalks are not present.

TSP Area Applicability

Gravel shoulders can be applied to any roadway in the study area. They are most suited to roadways with low vehicle volumes but that have pedestrian demand.

Pros

- Provides a space separated from motorists.
- Requires less right-of-way than a separated multi-use path.
- More cost-effective than installing sidewalks or pedestrian shoulders.

Cons

- Does not provide physical protection from vehicles.
- Not accessable for people with disabilities and not suitable for strollers or bicycles.
- Shoulders serving other uses, such as disabled vehicles, parking, or farm equipment may require pedestrians to use travel lanes.

Design Considerations

- A 6-foot width is preferred to accommodate pedestrian travel, with a 4-foot minimum in constrained areas. Greater widths can be used in higher-speed locations.
- Rumble strips or profiled striping can be used to enhance safety and minimize motorists encroaching on the shoulder.
- May require right-of-way acquisition.

Complementary Strategies

- Rumble Strips

Safety Treatments

RUMBLE STRIPS

Brisbane, CA
http://brisbaneca.blogspot.com/2008_12_01_archive.html

Austin, TX

Libson, MD

Rumble strips are pavement surface treatments intended to cause drivers to experience vehicular vibrations signaling them to slow down. Rumble strips can be raised pavement markers across the roadway or grooves along the shoulder or centerline. Rumble strips are best used in conjunction with other traffic calming treatments.

TSP Area Applicability

During the past five years, more than 50 percent of the reported crashes in Multnomah County were single vehicle crashes. Rumble strips could be effective at reducing these types of crashes by alerting drivers that they are entering a part of the roadway not intended for use.

Pros

- Low cost.
- Speed reduction and increase in driver awareness.
- Increased sense of safety for pedestrians and bicyclists if the shoulder width is adequate.

Cons

- Vibration noise created may be inappropriate in residential areas.
- Impact the comfort and control of bicyclists and agricultural equipment.
- Potential impacts on pavement deterioration based on pavement quality and placement.

Design Considerations

- All road users need to be considered and accommodated. Bicycles need particular attention, especially if they are expected to use the roadway or shoulders.
- There are a variety of types of rumble strips, so the site application should be considered to determine the most appropriate design.
- May not be suitable in areas with significant agricultural activity.

Complementary Strategies

- Shoulder Bikeways
- Bicycle Climing Lanes
- Pedestrian Shoulder

Safety Treatments

INCREASED SHOULDER WIDTH


Tucson, AZ


Boise, ID

A wide shoulder can be used to provide a separated space for cyclists and pedestrians, assist with vehicular recovery during driver inattentiveness, assist with incident response and emergency situations, and provide space for motorists to bypass slow moving vehicles such as farm equipment.

TSP Area Applicability

During the past five years, more than 50 percent of the reported crashes in Multnomah County were single vehicle crashes. Widening the shoulders could be effective at reducing these types of crashes by providing space for recovery along more narrow roads, especially Germantown Road, Skyline Boulevard, Reeder Road, Sauvie Island Road, Gillihan Road

Pros

- Provides drivers more opportunity to recover before departing the roadway or slow their vehicle to a controlled stop.
- Wider shoulders may be used by pedestrian and bicyclists when other facilities are not present.
- Widening the shoulder could allow for shoulder rumble strips.
- As a current Multnomah County standard, knowledge and equipment for maintenance is available.

Cons

- Additional right-of-way may be required.
- Potential impacts to wildlife crossings and rural character.
- Potential increase in vehicle speed due to wider street cross-section.

Design Considerations

- Adequate right-of-way is necessary.
- On Sauvie Island, levee restrictions may alter design or prohibit construction.

Complementary Strategies

- Curve improvements
- Rumble Strips

CURVE IMPROVEMENTS

Source: MUTCD

Curve improvements include a variety of treatments that help to inform the driver of the presence and characteristics of curves. Treatments include, but are not limited to, curve warning signs, decreased speed signs, curve delineation posts, and illumination.

TSP Area Applicability

Curve improvements can be applied county-wide. Many of the rural roads in Multnomah County are winding with limited warning to drivers of the impending curves. In addition, many of the reported crashes in Multnomah County occur on or around roadway curves. Providing curve warning signs and delineation posts may help to reduce crashes along county roadways., especially along Cornealius Pass Road, Germantown Road, Gillihan Road, and Lusted Road.

Pros

- Provides advanced notification to road users of location and characteristics of potentially unexpected curves.
- May help to decrease crashes on curves.

Cons

- Contributes to sign clutter.
- Requires additional cost and maintenance

Complementary Strategies

- Increased shoulder width

RURAL INTERSECTION IMPROVEMENTS


Anchorage, AK

Intersection improvements include a variety of treatments to help all modes efficiently and safely travel through intersections. Treatments include, but are not limited to changing intersection control type or changing the stop-controlled approaches, adding turn lanes, adding marked or active crossing treatments, and providing adequate roadway illumination.

TSP Area Applicability

Many locations in the West Hills, Sauvie Island, and East County would benefit from intersection improvements that help all modes move safely and efficiently on the roadway system. More in depth analysis is necessary to provide recommendations on specific treatments to the intersections.

Pros

- Lighting increases night-time visibility of roadway users and animals and sense of security for all roadway users.
- Possible improved operations of the intersection.

Cons

- Cost of design and construction.
- Potential right-of-way acquisition.
- Increased maintenance costs with signals and illumination

Complementary Strategies

- Shoulder widening
- Rumble strips
- Wayfinding signage

RAILROAD CROSSING IMPROVEMENTS

Source: www.iqtrafficontrol.com

Source: urbanpostmortem.wordpress.com

Railroad crossings can have passive control (devices that mark the location of a crossing such as cross-bucks and yield or stop signs) or active control (devices that mark the location of a crossing and indicate the approach or presence of a train such as flashing lights and gate arms). Active crossings are relatively expensive to install and maintain but provide increased safety compared to a passive crossing.

Design Considerations

For private railroad crossings (those at a driveway or private road), improving the crossing from passive control to active control requires railroad permission and a contract between the property owner and the railroad. Public crossings in Oregon (generally those at a crossing of a public road) are regulated by the Oregon Department of Transportation (ODOT). ODOT's Rail Division follows a federal mandate to consolidate at-grade railroad crossings. The federal direction has resulted in a requirement to close one or more crossings when a new crossing is constructed or an existing crossing is upgraded.

Upgrading crossings to active control in rural areas typically ranges from $200,000 - $500,000. In addition, railroad companies typically require crossing owners to pay $5,000 - $10,000 per year per crossing in annual maintenance fees to compensate for additional weekly inspections and maintenance required over the life of the crossing.

When railroad crossings are upgraded to active crossings the railroad tracks and the road bed typically also require reconstruction to current standards. The road grade at the crossing must have no more than approximately a three inch rise or fall within 30 feet of either side of the tracks per national standards. This can result in the need to re-grade the roadway or railroad track approaches to the crossing.

TSP Area Applicability

There are several passive railroad crossings in the study area along Highway 30 and the Historic Columbia River Highway. Private property owners may be able to get permission to upgrade crossings from the railroad; however, public crossing upgrades will require a plan to consolidate and close one to two other public or private crossings. The best candidates for crossing upgrades are those with flat crossings with good visual clearance.

Pros

- Provide active control and effectively communicates to vehicles, pedestrians, and bicyclists the need to stop at the railroad crossing.

Cons

- Costly and likely to require closure of other crossings.

Complementary Strategies

- Warning/advisory signs

Signage and Signal Treatments

WAYFINDING SIGNAGE

Source: Andy Daleiden, KAI

Signage indicating to bicyclists and pedestrians the direction and distance to points of interest along a corridor. Wayfinding signs can also be used to inform drivers of key recreational destinations, parking, etc.

TSP Area Applicability

Provide guidance to motorized and non-motorized users to areas of interest such as types and location of recreation, parking, and other key destinations.

Pros

- Encourages walking and biking by providing access information to major attractions.

Cons

- Additional cost and maintenance.
- Potential for sign clutter.

Design Considerations

- Place in key locations/decision points such as intersections.

Complementary Strategies

- Multi-use paths
- Bike lanes
- Pedestrian paths
- Bike map

Signage and Signal Treatments

WARNING/ADVISORY SIGNS

Signage providing guidance or warning about unexpected conditions for all users of the roadway.

TSP Area Applicability

Signs can be used on county roadways to inform motorists of bicycles sharing the road, locations of frequent pedestrian crossings, and roadway curvature. Signage may be particularly helpful along those roadways that remain "shared use" as well as areas with limited visibilities of roadway curvature and upcoming intersections.

Pros

- Provides advanced notification to road users of unexpected conditions; i.e. pedestrians entering the roadway, curves, etc.
- Creates more awareness by motorists of the shared use and to look for bicyclists.

Cons

- Contributes to sign clutter.
- Additional cost and maintenance.

Complementary Strategies

- Curve improvements
- Shared lane roadways

Signage and Signal Treatments

SPEED LIMIT SIGNS

Signage providing guidance on appropriate speeds for traveling the roadway.

TSP Area Applicability

Speed limit signs can be applied at any un-signed roadways throughout rural Multnomah County, including Gillihan Road.

Pros

- Alerts the driver to speeds appropriate for the roadway.
- Informs pedestrians and bicyclists about the suitability of the road for their comfort level.

Cons

- Contributes to sign clutter.
- Additional cost and maintenance.

Complementary Strategies

- Shoulder bikeways and shared lane roadways

Signage and Signal Treatments

SIGNAL CONTROLLER/TIMING PLANS

A traffic signal controller runs the signal timing and phase plan for a given traffic signal. Various timing plans can be used for different times of day (e.g. peak and off peak hour), time of years, and special events.

TSP Area Applicability

There are opportunities to at intersections throughout the County to improve/install signal controllers or timing plans. In particular, the existing controller at the intersection of Sauvie Island Road and Highway 30 is programmed but operation has degraded with age. The internal clock that controls the timing plans is faulty. Upgrading the controller to a newer version could provide more effective signal operations.

Pros

- Effective movement of vehicles through an intersection.
- Better efficiency reduces congestion which can lead to safety benefits.

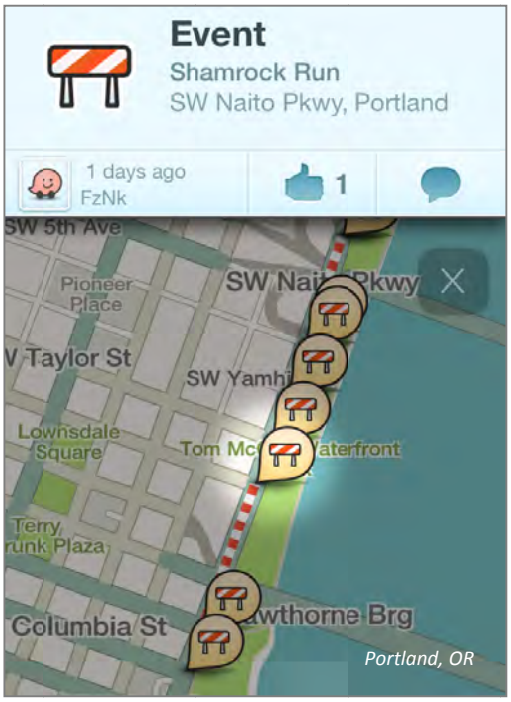
Cons

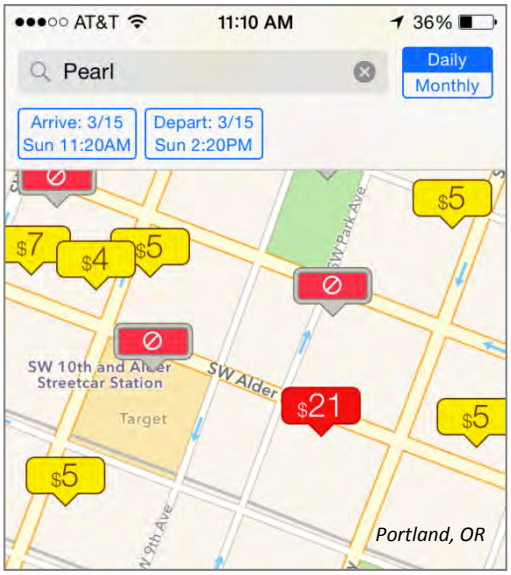
- Controller upgrades can be expensive.

Complementary Strategies

- Event permit calendar
- Event-based TDM plans

USER-GENERATED PARKING INFORMATION





User-generated parking information would provide visitors and/or event participants with information about public or privately-held parking availability. This information is "shared" amongst system users through "apps" and other electronic means. This type of strategy has been implemented successfully for real-time user-generated traffic information by apps such as Waze, where users can report incidents or other temporary issues affecting traffic.

TSP Area Applicability

This strategy could be implemented through the development of a smart-phone app and corresponding installation of real-time signage at key locations in the county. These signs could be useful to:

- Visitors arriving at popular locations, such as the Sauvie Island beaches and Gorge area tourist areas, are encouraged to log-in to the app and report on the current availability of parking.
- Provide users traveling to the county with information about parking availability and traffic congestion.
- Business owners and event organizers that can advise potential visitors to come later or park at alternate locations.

Pros

- Can help avoid unnecessary trips when no parking is available.
- After the development of the app and installation of the signage, does not require additional staffing or investment.

Cons

- Relies on users to generate information, which may result in inconsistent or infrequent updates.
- Limited cell phone coverage in parts of Multnomah County. Only users with smartphones and cell service can access.

Design Considerations

- Signage should be visible and easy to understand
- App could be designed with a "points" system and rewards for consistent users that report parking information, such as discounts on permits.

Complementary Strategies

- Parking permit pricing
- Park-N-Ride lots

REAL-TIME PARKING INFORMATION

Real-time parking information can help avoid unnecessary trips by letting visitors know when and where parking is already fully occupied. Digital displays are frequently used in parking garages, where automated counting or sensing is installed. Lower-tech options are also possible that rely upon a person to update the sign message. This information is provided by a designated staff person or through the use of parking sensors or video, rather than relying on users to report parking availability to other users.

TSP Area Applicability

Due to the predominance of graveled parking on Sauvie Island and other recreational areas throughout the County, it is not currently feasible to install detection or sensor on most parking locations. Instead, this strategy could be implemented through lower-tech methods such as:

- Informational maps of all parking locations can be readily available for visitors and tourists, with various locations numbered or color-coded for easy "real-time" information communication
- On Sauvie Island, on the busiest weekends, patrol officers, ODF&W, paid attendants, or volunteers at busy locations could relay information to the Cracker Barrel store, where information about the parking locations shown on the map would be posted for visitors arriving to the Island.
- In cases where popular parking locations are full, an information board could suggest alternate parking locations.
- Video cameras could be installed at key parking areas with complementary displays posted near the entrance to the Island, other advance information areas, and online.

Pros

- Can help avoid unnecessary trips when no parking is available.
- Provides a low-tech way to provide information to all visitors

Cons

- May require manual updates from people at the locations of parking and a display board, unless video cameras are installed.
- Video cameras may raise privacy concerns

Design Considerations

- Signage with information about parking locations and availability should be positioned so that it is easily understood and visible to visitors entering Sauvie Island.

Complementary Strategies

- Parking permit Pricing
- Park-N-Ride lots

OPTIMIZE PARKING PERMIT PRICING

Pricing parking is a powerful tool for managing demand. Requiring payment for parking can influence travelers' choice to carpool or use other modes.

TSP Area Applicability

Visitors to specifc locations within Multnomah County pay for daily or hourly parking. For example, Sauvie Island visitors currently pay $7 for a daily permit to park in wildlife areas on the island, andannual permits cost $22. Permiting could also be considered for additional tourist and recreation areas including in the Gorge. Additional strategies for consideration include:

- Permit pricing could be implemented or increased during high-traffic times, such as prime weekends, and decreased during lower-traffic times, such as week days or winter months, to help address concerns with the amount of visitors.
- Annual permit costs could be increased or split into two "season" permits, with winter season having a much lower cost.
- Requiring permits for all vehicles entering high-demand areas, such as Sauvie Island. Resident parking could be free or at a low cost covering only permit administration.
- Additional fees for parking could be collected in popular or congested locations, such as the beaches.

Pros

- Can generate revenue as long as administrative costs are not substantial.
- Is demonstrated to help manage demand, since people are price-sensitive.

Cons

- May be perceived as unfair or bad for business by some county businesses if all visitors are required to obtain permits. Today, only those visitors desiring to use a public parking facility are required to buy permits for Sauvie Island.
- Cost of enforcement.

Design Considerations

- Any increases or changes to the pricing structure could be accompanied by an explanation of where the additional revenue will be used. In examples where people are able to see the local benefit of the parking revenue, they are much more likely to support the increased costs.

Complementary Strategies

- Park-N-Ride lots

PARKING ENFORCEMENT

Regular enforcement of existing parking regulations can improve compliance. If people expect to receive a ticket for improper parking, they are more likely to seek other options.

TSP Area Applicability

Enforcement officers could increase the amount of patrolling and ticketing on peak weekends during the summer in wildlife or trailhead parking areas or in areas not designated for parking. Communication about the increased enforcement could motivate visitors to follow parking regulations before getting tickets.

Depending on results, enforcement efforts could be limited to specific times or days to minimize the additional staffing investment.

Pros

- Provides an economic incentive to follow the rules on parking locations by fining people for breaking them.
- Can generate additional revenue.

Cons

- Requires parking enforcement staff.
- May raise concerns from visitors or residents that have been accustomed to more relaxed parking enforcement.

Complementary Strategies

- Parking Information
- Park-N-Ride lots

PARK-N-RIDE LOTS

Park-n-ride lots offer people a place to park their cars when transferring to a different mode, such as carpooling with another person, bicycling, or taking transit.

TSP Area Applicability

Due to high visitor demand during peak seasons on Sauvie Island and increased Gorge tourism, several areas in the County could benefit from the addition of a park-n-ride service. An off-island park-n-ride could be located along Highway 30 south of Sauvie Island in an industrial area. Partnerships for shared parking could be established for existing private parking that is used primarily during the week. This could enable:

- Beach-goers and Gorge visitors to form carpools to go to the island or key tourist and recreational areas, leaving other vehicles at the park-n-ride locations.
- Bicyclists to leave their cars and ride their bicycles from parking locations on Highway 30 or near the HCRH.
- Provision of shuttle service from the park-n-rides during events or high-traffic weekends.


Portland, OR, Google Earth

Pros

- Facilitates use of carpooling and can reduce need for parking on the island and at key tourist destinations.
- Can more effectively utilize parking spaces that are normally used primarily during the week.

Cons

- Would need to negotiate public access to existing parking locations.
- More distant park-n-ride lots may not appeal to bicyclists if bike route to the destination is not comfortable for many riders.
- May raise liability issues for parking arrangements on private properties.

Design Considerations

- Signage and online information to promote the park-n-ride lot would need to be prominent to ensure that visitors know its location and that they can use it.

Complementary Strategies

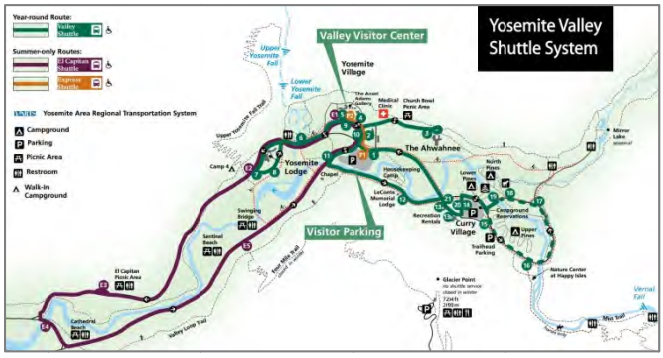
- Shuttle service
- Parking pricing
- Event TDM strategies

SHUTTLE SERVICE

A shuttle circulator service could provide access to popular county locations during peak weekend days during the summer.

TSP Area Applicability

A service for Sauvie Island or the Gorge could operate as a circulator during peak weekend days, allowing people to park once and then travel in the shuttle to popular locations. On Sauvie Island, this shuttle could run between the Cracker Barrel store and the beach during the peak summer days. In addition, shuttles could be chartered for particular event weekends, or by large events, to serve special event visitors. In these cases, shuttles could also travel to and from off-island park-n-ride locations.



Pros

- Could provide an alternative to driving and parking on Sauvie Island and other key tourist destinations.
- If effectively utilized, could allow for more visitors with fewer traffic and parking impacts.

Cons

- Funding shuttle service may be difficult to sustain.
- Without consistent service, people may not be able to rely on the shuttle being available.

Design Considerations

- Signage and online information to promote the shuttle service would need to be prominent to ensure that visitors know its location and how they should use it.

Complementary Strategies

- Parking pricing
- Event permits / calendar
- Park-n-ride lots

EVENT PERMITS / CALENDAR

A system of event permits requires event organizers to register events through a central calendar system. A permit issued for each event states the requirements that each would have to meet.

TSP Area Applicability

This system could allow for coordination between same day events throughout Multnomah County or in smaller sub-areas. This idea builds on the existing voluntary event permit system through the Sauvie Island Community Association and could remain informal or could be administered by a local TMA or by the County. This system could include:

- Events over a certain size limit could be required to implement a transportation demand management (TDM) plan for the event which would outline how the event will utilize any number of different TDM strategies to reduce traffic impacts.
- Provision of incentives, such as partial reimbursement for shuttle costs, for events demonstrating a certain level of non-drive-alone mode share.
- For Sauvie Island, provision of a daily "cap," if necessary, on the total number of event attendees arriving to the island in private vehicles, in order to help avoid days with the highest levels of congestion. For example, under the same cap, one large event or four smaller events may be able to occur on the same day – but all five would not be able to be held concurrently.

Pros

- Allows for anticipation of heavy traffic days.
- By capping total anticipated event attendance per day, events can be spread more evenly throughout the year.
- Provides a mechanism for coordination TDM strategies among event planners.

Cons

- Administration of the permit system and calendar may require additional staff time.
- Event planners may have to commit to certain dates earlier than they would otherwise.
- Could result in conflicts between event organizers/local businesses in the competition for popular dates.

Complementary Strategies

- Park-n-ride lots
- Event-based shuttle system
- Modified signal timing

EVENT-BASED "TDM" PLANS

Photo: Thomas Cobb, Travel Portland

Events of a certain size would be required to submit a transportation demand management (TDM) plan in order to receive an approved event permit.

TSP Area Applicability

Organizers of large events would need to provide a transportation demand management plan to demonstrate ways that they will manage impacts. Transportation demand management plans could include:

- Traffic management plan – organizers must demonstrate how they would manage the arrivals and parking for attendees of the event, including:
  - providing adequate parking to accommodate attendees
  - employing flaggers, if needed
  - arranging for overflow parking in alternate locations, if needed
  - coordinating with other events occurring in the same time-frame.
- Demand management strategies – organizers can draw on a number of demand management strategies to reduce vehicle trips:
  - Carpool/ride-matching for event attendees
  - Promotion of park-n-ride location for carpools, bicyclists, or other recreational visitors
  - Provide shuttle or van service from a park-n-ride location
  - Charging fees for event parking

Pros

- Reduces congestion on roadways
- Adds accountability for events .
- Will encourage thorough planning and help mitigate impacts of larger events.
- Can be tied to development code requirements for agri-toursim activities.

Cons

- Increases the organizational burden for event planners.
- Requires staff time to review TDM plans and work with event planners.

Complementary Strategies

- Park-n-ride lots
- Event permit / calendar
- Shuttle service
- Valet bike parking
- Modified signal timing

USER FEES/CONGESTION PRICING

User fees, also known as tolls, establish fees for motorists using specific facilities. These fees could rise on a portion or all of a roadway in relationship to the severity of congestion.

TSP Area Applicability

User fees and/or congestion pricing are most applicable to roadways or facilities that provide key connections that are currently overburdened. ODOT is currently piloting a road usage charge (RUC) system, in which motorists pay for miles traveled instead of paying the gas tax. As this pilot system is further tested, it may have applicability to the county on a system-wide basis.

Pros

- Reduces congestion on roadways.
- Encourages motorists to switch to a differenent mode including car-sharing, walking, biking, or transit.
- Depending on pricing structure, can encourage motorists to travel during non-peak hours and when congestion is not severe.
- Provides revenue for transportation and infrastructure projects.
- Charges road users for use of public facilities.

Cons

- Jurisdictions would need to set up a payment system and infrastructure to collect the fees.
- Can shift vehicle traffic to other non-priced facilities.
- Different types of tolls and pricing, including pricing, have different levels of public acceptance. Obtaining public support for fees on existing facilities can be a significant challenge. The public is most likely to support pricing when the results are perceived as as positive (e.g. less congestion).
- Tolls are not generally implemented on existing facilities without additional improvements.

Complementary Strategies

- Flexible work time/telecommuting

FLEXIBLE WORK TIME/TELECOMMUTING

Flexible work time and telecommuting allows employees to modify work hours and work from home. Modified work hours could be standardized and result in compressed work schedules and/or staggered shifts.

TSP Area Applicability

Employers would need to provide these options to employees to implement this strategy. It can be part of the County's or employer's transportation demand management plan.

Pros

- Can reduce demand on roadways during peak commute hours.
- Provides flexibility for employees to take transit, participate in rideshares, or commute during off-peak times of the day.
- Reduces number of commute trips.
- Can be viewed as a benefit to employees, offering them more flexibility in their work hours.

Cons

- Increases organizational burden for employers.
- May reduce staff interactions between employees.
- Can make meetings more difficult to schedule.

Complementary Strategies

- User fees/congestion pricing

Section 4
Goals and Policies

GOALS AND POLICIES

This section details the transportation goal and policies that guide the following Multnomah County Transportation System Plan. They represent the culmination of the existing needs and guidance from the CAC, citizens, business owners, the PMT and governmental agencies within Multnomah County.

TRANSPORTATION GOAL

GOAL: To provide a safe and efficient transportation network for all modes of travel that serves the rural areas of the County and achieves the following objectives:

1. Implement a transportation system that is safe and efficient in meeting the needs of area residents.
2. Implement a balanced transportation system that supports all modes of travel.
3. Develop a transportation system that supports the rural character of unincorporated Multnomah County.
4. Develop a transportation system the supports a healthy economy.
5. Provide transportation improvements in a timely manner according to funding capability.
6. Reduce vehicle traffic on rural County roadways caused by those traveling through the area.

TRANSPORTATION POLICIES

Policy 1: Overall Transportation System

Maintain and improve the transportation system for all modes of travel with the following goals: reducing vehicle miles travelled, minimizing carbon emissions, reducing conflict between travel modes, and improving the natural environment by minimizing stormwater runoff and facilitating wildlife movement. Ensure that the transportation system reflects the community's rural character while ensuring efficiency and local connectivity.

Strategies

a) Explore implementing measures for traffic calming, traffic diversion, and speed enforcement.
b) Address climate change impacts and the Climate Action Plan's recommended actions when planning transportation investments and service delivery strategies.

Policy 2: Overall Transportation System

Develop and implement effective use of signage designed to educate the public about farm equipment using roads, wildlife crossings and bicycle and pedestrian safety, as well as additional way finding signage.

Policy 3: Overall Transportation System

Promote a transportation system that prioritizes and supports the efficient and safe movement of farm and forest vehicles and equipment.

Policy 4: Overall Transportation System

Coordinate with public service providers and private utility suppliers to maximize the efficient delivery of both public and private utilities and facilities in County Right of way.

Strategies

a. Work with utility companies that own transmission and distribution lines to strive to bury the power lines to provide more secure power service during emergency situations and improve scenic qualities.
b. Coordinate utility and road work whenever possible.

Policy 5: Overall Transportation System

Implement and maintain a balanced, safe, and efficient transportation system using the existing roadway network.

Strategies

a) Review and maintain a trafficway classification system integrated with land uses and travel needs. The hierarchy of functional classifications should be based on trip types and length, traffic volume and travel modes, and access to adjacent land uses.
b) For capital projects, improve streets to the standards established by the classification system and the Multnomah County Design and Construction Manual while maintaining context sensitivity.
c) Implement access management standards established in the Multnomah County Road Rules and the Multnomah County Design and Construction Manual while maintaining context sensitivity.
d) Place priority on maintaining the existing trafficways.
e) Review land use development and condition improvements on County Roads based on functional classification and standards set forth in the Multnomah County Design and

Construction Manual to mitigate impacts. Transportation and land use development review should be coordinated.

f) Implement the land development process adopted in the Multnomah County Road Rules where half-street improvements or dedication of a right-of-way or easements can be required as conditions of a permit for land development abutting a County road.
g) Maintain inventory of current and projected deficiencies on the County's road network as the basis for Capital Improvement Plan and Program, including general roadway improvements, bicycle improvements, pedestrian improvements, and wildlife crossing improvements.
h) Coordinate policy and development review work with Multnomah County Land Use Planning program which regulates off-street parking and loading areas, including parking for vehicles, trucks, and bicycles through Multnomah County Code.

Policy 6: Active Transportation

Identify, prioritize, and implement short- and long- term solutions to safely accommodate multiple modes of travel on County roads including on-road bikeways, separated multi-use paths, and explore funding options.

Strategy

a) Apply context sensitive roadway improvements and evaluation of projects.

Policy 7: Active Transportation

Implement context sensitive design when reviewing rural road standards to determine appropriate paved shoulder widths to preserve the rural character of roads, while supporting all modes of travel.

Strategies:

a) Explore options for bike pull outs and passing lanes to allow for resting and passing
b) Consider bike-friendly road treatments, especially in regards to maintenance of the road
c) Consider bike and environment friendly materials and treatments such as pervious asphalt
d) When widening, shoulders should aim to achieve a minimum 3 foot paved width.
e) Explore services and facilities to support multimodal uses that reflect rural character and reduce impacts on surrounding land uses and wildlife connectivity.
f) Prioritize use of centerline rumble strips for the purpose of supporting efficient and safe movement of vehicles and avoid the use of fog line rumble strips which endanger bicyclists. If fog line rumble strips are used, safe facilities should be designed that allows for bikes to ride safely, such as the application of adequate shoulders.
g) In areas with steep slopes, landslide hazards, or wildlife habitat, first consider alternatives such as signage and TDM strategies that do not require additional impervious surfaces.

Policy 8: Active Transportation

Develop and support programs and projects that educate and increase the safety of non-motorized transportation options in the County, and reduce dependency on automobile use and to reduce vehicle miles traveled (VMT) by:

a) Promoting bicycling and walking as vital transportation choices.
b) Assuring that future street improvement projects on a designated bikeway and walkways are designed to accommodate and improve safety for bicyclists, pedestrians and transit users.
c) Striving to use federal, state, and local best design practices for bicycle and pedestrian facilities when improving County roadways while maintaining context sensitivity.
d) Providing for bicycle and pedestrian travel through the development and adoption of a County-wide Transportation Capital Improvements Program (CIP) that includes all the bikeways and walkways identified in the Multnomah County Bikeway and Pedestrian System Maps.
e) Placing priority on transportation system improvements in the Capital Improvement Plan that reduce the number of crashes involving bicyclists and pedestrians, the roadway's most vulnerable users.
f) Supporting transportation options programs in the region including Safe Routes to School, bicycle tourism initiatives (where appropriate), the development of future Transportation Management Associations (TMAs), and other programs funded through the Regional Travel Options program.
g) Supporting programs and policies that increase awareness of transportation options and education about safety on the transportation system for all modes and users.
h) Supporting the conversion of railroad lines to multi-use paths, such as the Burlington Northern Cornelius Pass Road rail line.

Strategies

The following strategies should be used to implement the County's bicycle and pedestrian system:

a) Identify a connected network of pedestrian and bicycle facilities and access to transit, which provides the framework for future walkway and bikeway projects.
b) Periodically review and update the Multnomah County Design and Construction Manual to include the most up-to-date national, state, and local best practice for the design of bicycle and pedestrian facilities.
c) Coordinate with Metro to implement bicycle and pedestrian networks in the Regional Transportation Plan (RTP, the Regional Transportation Functional Plan (RTFP), and other local transportation system plans. Participate in updates to regional and local transportation plans.
d) Continue to support and coordinate with Metro and other partner agencies in regional trails projects that may affect rural Multnomah County, recognizing trails as a vital component to the regional active transportation network while protecting natural resources and habitat.

e) Continue to seek funding for identified bicycle and pedestrian improvements, such as but not limited to state and regional grant sources.
f) Maintain the Bicycle and Pedestrian Citizen Advisory Committee to provide input on Multnomah County Transportation Division projects and programs, including proposed bicycle and pedestrian project criteria and project design.
g) Ensure there is a comment, review, and public involvement process for planning, engineering, operations and maintenance projects for the appropriate neighborhood groups and cities within Multnomah County.

Policy 9: Active Transportation

Support and promote bicycle and pedestrian safety and education in County Schools

Strategies

a) Develop and maintain an active program in schools, consistent with the federally recognized program utilizing the five Es: education, encouragement, enforcement, engineering, and evaluation.
b) Continue to identify and fund bicycle and pedestrian infrastructure to increase safety around schools the through Capital Improvement Program

Policy 10: Mobility and Freight

Consider regional mobility and freight, and study alternative routes and modes for mobility and freight through unincorporated Multnomah County, including addressing community needs.

Strategies

a) Study alternatives to routes through the West Hills.
b) Participate in Regional Overdimensional Truck Routes Study and other regional studies as applicable.
c) Examine the suitability of use of County roads as truck routes.
d) Coordinate with other jurisdictions on truck impacts and ensure proper mitigation.
e) Promote transportation alternatives for the movement of freight
f) Review and implement weight and length limitations for County roads.

Policy 11: Safety

Reduce travel conflicts by providing appropriate facilities, signs, and traffic marking based upon user type and travel mode.

Policy 12: Mobility and Freight

Discourage through traffic on trafficways with a functional classification of rural local road or rural collector.

Policy 13: TDM, Outreach, and Transit

Implement a range of Transportation Demand Management (TDM) policies encouraging existing businesses and requiring new development (beyond single family residential use and agricultural uses) to help reduce vehicle miles traveled (VMT), and alleviate congestion on county roads caused by seasonal and special event traffic, as well as through commuter traffic.

Strategies

a) Develop a Countywide TDM program. Program concepts could include strategies such as shuttle buses, ride sharing, work-from-home, flex time, improved transit and access to transit, user fees or congestion pricing.
b) Seek funding opportunities, such as Metro's Travel Options grant program, to support TDM programming.

Policy 14: TDM, Outreach, and Transit

Coordinate and work with transit agencies and service providers (including, but not limited to, TriMet, CC Rider, and C-Tran) to identify existing transit deficiencies and the improvements necessary to increase access to transit services by potential users.

Policy 15: Safety

Work with the Oregon Office of Emergency Management, Multnomah County Emergency Management and Multnomah County rural fire protection districts to ensure that the transportation system supports effective responses to emergencies and disasters.

Policy 16: Funding and Maintenance

Explore alternative supplemental funding sources to improve County's road maintenance, safety projects, and other improvements.

Strategies

a) Consider long term maintenance costs with development of capital projects.
b) Review and update the County's Road Maintenance Program to implement applicable policies and strategies of the Comprehensive Plan and SIMC Rural Area Plan.
c) Review internal protocols related to road and right-of-way maintenance, including roadside hedgerow trimming and weed eradication. Work with the Soil & Water Conservation Districts, ODFW and wildlife conservation organizations to protect wildlife and manage invasive plant species to ensure that habitat and water resource restoration projects are coordinated with County road maintenance and drainage control programs.
d) Ensure that non-profit organizations and property owners are aware of County programs that may limit wildlife habitat restoration projects, and that County road staff are aware of existing and completed habitat restoration projects when they conduct their operations.
e) To implement this policy, the County Road Maintenance program will review the following recommendations:
    a. Except in emergency situations, County road mowing should be done between August 15 and March 15 to minimize impact to nesting birds, and workers should avoid mowing at identified turtle, frog and salamander crossings during nesting season (May and September).
    b. Culverts under county roads should be surveyed, then repaired and replaced as needed to limit barriers to fish and wildlife passage.
    c. County staff should work with ODFW and wildlife conservation organizations to identify and mitigate in areas where wildlife corridors cross county roads.
    d. Mowing equipment should be regularly cleaned so that seeds of invasive plants are not spread into areas where they have not yet been introduced. Incorporate erosion control best practices for mowing and other maintenance activities.
    e. County staff should confer with the Soil & Water Conservation Districts on best management practices for mowing operations and removing invasive weeds along road right-of-way.
    f. County staff should be trained to recognize invasive and desirable native plant species; Multnomah County should prioritize plant species for control.
    g. County staff should inform property owners of the existing Owner Vegetation Maintenance Agreement, which allows abutting property owners to maintain right-of-way vegetation.

Policy 17: Funding

Maximize cost-effectiveness of transportation improvements using the Capital Improvement Plan process and maintenance program.

Strategies

a) Coordinate intersection improvements as appropriate through the County's Capital Improvement Plan and the County's maintenance program.
b) Provide minor improvements during maintenance projects where possible.
c) Ensure the Capital Improvement Plan evaluation criteria adequately evaluates rural needs:
    a. Maintenance
    b. Cost effective improvements
    c. Safety
    d. Bicycle and pedestrian improvements
    e. Wildlife
    f. Equity
    g. Health
    h. Climate change

Policy 18: Safety

Provide a transportation system that functions at appropriate safety levels for all motorized and non-motorized traffic.

Strategies

a) Consider recorded accident rates and documented perceived risks (smart phone applications, websites, reported near misses, etc.) for all modes of transportation and recommend implementation of low-cost operational improvements within budgetary limits. Target resources to reduce accident potential in the top 10 percent of accident locations
b) Continue to monitor high accident location sites for all modes of transportation.
c) Implement access management standards to reduce vehicle conflicts and maintain the rural character of the area.
d) Perform safety audits to identify locations where roadway characteristics increase risks and work to reduce those risks.

Policy 19: Safety

Support safe travel speeds on the transportation system.

Strategies

a) Support speed limit enforcement through a variety of available techniques.
b) Apply design standards that encourage appropriate motor vehicle and truck speeds.

Policy 20: Environment

Avoid and minimize impacts to the natural environment, fish, and wildlife habitat when applying roadway design standards.

Strategies

a) Implement standards and best practices for all transportation projects with regard to water quality treatment - the reduction, detention and infiltration of stormwater runoff from existing and new impervious surfaces - to improve water quality as well as fish and wildlife habitats, consistent with requirements of the National Pollutant Discharge Elimination System - Municipal Separate Storm Sewer System Phase I Permit and the Water Pollution Control Facility - Underground Injection Control Permit, issued by the Oregon Department of Environmental Quality under the Federal Clean Water Act and Safe Drinking Water Act.
b) Implement standards and best practices for all transportation projects with regard to protection restoration of existing riparian buffers where waters of the state border current and future rights of way.
c) Implement a program for the assessment and prioritization of fish passage barriers at stream crossings following the Oregon Department of Fish and Wildlife (ODFW) Fish Passage Rules.
d) Secure funding for the restoration of existing fish passage barriers at stream crossings to meet ODFW Fish Passage Rules.
e) Identify and protect critical fish and wildlife migration corridors to prevent the further fragmentation of existing habitats by future project alignments.

Policy 21: Environment

Work with ODFW and other partners to identify wildlife corridors and wildlife crossings on County roads, and ensure that project design is wildlife friendly.

Strategies

a) Review and update Multnomah County Design and Construction Manual to include wildlife friendly design and construction options in the Zoning Ordinance and Transportation System Plan.
b) Implement project prioritization criteria that address wildlife and climate change in the Capital Improvement Plan and Program.
c) Improve identified wildlife crossings through the development and adoption of a countywide Transportation Capital Improvement Program (CIP) that includes projects that address deficient fish passage barriers and wildlife crossings.

Policy 22: Transportation Health

Ensure that the transportation system is designed to minimize negative health impacts and promote healthy behaviors and environments by:

A. Improving safety for all modes

Strategies

a) Lowering traffic speeds through speed limits, enforcement, and roadway design.
b) Minimizing modal conflict by planning and building bicycle and pedestrian networks that encourage travel on low-traffic streets or off-street trails.
c) Identifying and addressing real and perceived high crash corridors or hot spots with high crash rates.
d) Incorporating safety-related features and best practices when designing new facilities or renovating existing facilities.
e) Ensuring that vulnerable groups such as youth, elderly, low-income and disabled are engaged in planning and design efforts.
f) Supporting Safe Routes to School and other education and encouragement programs that teach people how to safely use the transportation system
g) Developing a transportation safety action plan.
h) Coordinating with land use planning for safe traffic control and parking at events and other peak use generators.
i) Coordinating with other agencies such as ODOT when appropriate.

B. Increasing opportunities for physical activity by promoting active transportation modes (walking, bicycling, transit, and equestrian) and multimodal access to parks, trails, open space, and other recreational facilities and employment centers.

Strategies

a) Building out multimodal transportation networks.
b) Ensuring safe, convenient, multimodal access to parks, trails, open space and other recreational facilities and employment centers.
c) Supporting Safe Routes to School and other education and encouragement programs that teach and encourage people to safely use active transportation modes.
d) Partnering with the Multnomah County Health Department on health promotion and chronic disease prevention programs and initiatives that focus on increasing physical activity.

C. Ensuring multimodal access to health supportive resources such as healthy food retail, employment, affordable housing, and parks and recreation facilities.

Strategies

a) Coordinating land use planning to ensure that such resources are easily accessible by multiple modes.
b) Working with transit providers to ensure that service plans are coordinated with development.
c) Working with transit providers to ensure that bicycle and pedestrian improvements support transit use.
d) Ensuring site design guidelines and requirements provide and promote multimodal site access and circulation, and appropriate connections.

D. Reducing exposure to air, light, and noise pollutants

Strategies

a) Encouraging programs that reduce dependence on single occupant vehicle miles travelled and increasing use of electric and low emission vehicles.
b) Encouraging bicyclists and pedestrians to use parallel low traffic streets where possible instead of high traffic roadways.
c) Coordinating transportation and land use planning to avoid locating sensitive land uses near high traffic roadways. Sensitive land uses include schools, parks and playfields, community and senior centers, affordable housing, and other places where vulnerable groups such as youth, seniors, and people with low incomes spend significant amounts of time.
d) Establishing vegetative buffers (trees and shrubs) along roadways to filter and reduce the air and light pollutants.
e) Implementing anti-idling campaigns around schools, road construction zones, and other places where drivers tend to idle.
f) Using paving materials that are designed to minimize the production of road noise.

E. Working with Multnomah County Health Department staff to ensure that the TSP and related planning documents incorporate the findings and recommendations from the most recent versions of their Community Health Assessment and Community Health Improvement Plan.

Strategies

a) Having relevant health department staff serve on planning related technical and advisory committees.
b) Having relevant planning staff participate in the development of the community health assessments and community health improvement plans.

Policy 23: Transportation Equity

Ensure that transportation system plans and investments not only equitably distribute the benefits and burdens of the system improvements, but also prioritize and support programs and projects that eliminate transportation-related disparities faced by groups that have historically had significant unmet transportation needs or who have experienced disproportionate negative impacts from the existing transportation system.

Strategies

a) Incorporation of project prioritization criteria that address equity in the County Capital improvement Plan and Program to address investments in road, bicycle, and pedestrian programs and infrastructure in order to improve mobility and access for people who don't have access to a personal vehicle.
b) Investments in areas with relatively high concentrations of people that have historically received relatively little benefit from transportation system investments should be considered. These people include:
    a. *People who cannot drive.* People in this category include many older adults, children, and persons with disabilities.
    b. *People experiencing poverty,* including those who do not have access to a car, are struggling with the high costs of car ownership, maintenance, and operation, or are struggling with the cost of transit. People in this category include many people with low incomes, people of color, older adults, persons with disabilities, people who are geographically isolated, and people who experience language barriers.
    c. *People with limited mobility.* People in this category include many older adults and persons with disabilities.
    d. *Isolated individuals living far from community centers and lacking direct routes for accessing goods and services.*
    e. *Communities experiencing racism and discrimination.*

c) Coordinating transportation planning with land use and development to avoid locating sensitive land uses near high traffic roadways. Sensitive land uses include schools, parks and playfields, community and senior centers, affordable housing, and other places where vulnerable groups such as youth, seniors, and people with low incomes spend significant amounts of time.
d) Coordinating transportation planning with land use and development to ensure that new development is well connected with existing development and provides convenient multi-modal access to health supportive resources such as schools, healthy food retail, employment, affordable housing, parks and recreation facilities, and medical and social services.
e) Ensure that public participation includes outreach to equity focused or population specific organizations or culturally specific organizations and explore partnerships with these groups to develop the capacity to effectively participate in planning processes.
f) Working with the Multnomah County Office of Diversity and Equity to use their Equity and Empowerment Lens tool to ensure that county planning staff and project stakeholders are prepared to engage in internal and external conversations about equity and use this input to inform plans, policies and projects.
g) Conducting equity analyses that identify existing disparities as a part of county planning processes.
h) Gathering available data and public input useful for understanding equity issues, impacts and opportunities.

Policy 24: TDM, Outreach and Transit

On rural roads with heavy through traffic, consider implementing appropriate measures such as Transportation Demand Management (TDM) to reduce such traffic.

SAUVIE ISLAND AND MULTNOMAH CHANNEL RURAL AREA TSP POLICIES

Policy 5.1

The Multnomah County Bicycle and Pedestrian Advisory Committee should maintain continuous Sauvie Island representation to the extent possible.

Policy 5.5

Coordinate with ODOT Rail and Public Transit Division to promote appropriate safety devices at crossings.

Policy 5.6

Coordinate with the Oregon Department of Fish and Wildlife (ODFW) and Columbia County to manage and reduce demand on the Sauvie Island transportation system, especially during peak use periods, by making more efficient use of capacity on the system through strategies such as user fees, shuttles, and parking management programs. Strategies may include, but are not limited to:

a) Encourage and support action by the Oregon Fish and Wildlife Commission to increase daily fees during peak use periods to an amount that will effectively reduce the traffic burden on Sauvie Island roads and reduce adverse wildlife impacts resulting from heavy traffic, noise and dust.
b) Encourage Columbia County and the Columbia County Sheriff to prohibit parking on county roads outside designated parking areas and to post and enforce its parking restrictions.
c) Encourage the use of ride sharing, and support safe and convenient park-and-ride facilities for carpools and transit service in convenient and appropriate off-island locations.
d) Explore options for shuttle support and traffic reduction strategies such as traffic fees and parking management programs.
e) Coordinate with transit agencies and service providers to identify existing transit deficiencies and the improvements necessary to increase accessibility to transit service by potential users.

Policy 5.13

Encourage the Multnomah County Sheriff's Office to explore increased patrols and service to the island and keep the Sherriff's Office apprised of identified peak periods (days and seasons).

Policy 5.14

Maintain updated traffic counts for the plan area capturing peak season volumes.

Policy 5.15

Explore opportunities to connect Marina Way to Larson Road and extend Larson Road north of the Sauvie Island Bridge to provide safer and more convenient access for marina residents and patrons along Multnomah Channel.

Policy 5.16

Explore opportunities to provide public restroom facilities for Sauvie Island visitors.

Section 5 Transportation System Plan

TRANSPORTATION SYSTEM PLAN

This section details the projects and programs needed to serve Multnomah County through 2035. They represent the culmination of the existing needs and guidance from the CAC, citizens, business owners, the PMT, and governmental agencies within Multnomah County. The projects and programs help to ensure and support the efficient and safe multimodal movement of people and goods throughout the county.

ROADWAY FUNCTIONAL CLASSIFICATION AND STANDARDS

Functional classification systems are used to establish a hierarchy of roadways based on their primary function (e.g., moving people across regions or providing access to local destinations). These classification levels are identified by ODOT for state facilities, the County for County facilities, and local agencies for their own classification levels within their community. The classification levels also determine the recommended roadway cross-sections for different facilities. The functional classification of roadways that Multnomah County established is based on the following hierarchy:

- **Minor Arterials** represent the lowest order arterial facility in the regional street network. They typically carry less traffic volume then principal and major arterials, but have a high degree of connectivity between communities. Access management may be implemented to preserve traffic capacity. Land uses along the corridor are a mixture of community and regional activities. Minor arterial streets provide major links in the regional road and bikeway networks; provide for truck mobility and transit corridors; and are significant links in the local pedestrian system.[2]
- **Rural Arterials** are the primary means of access into the County's large rural districts, and often connect between counties to accommodate through movements. Rural arterials connect to freeways or highways, and link rural collector and local roads to the urban area and other regions. Rural arterial roads carry greater traffic volumes then rural collector roads, including commuters and other home-based trips, truck trips related to farm, forest, and other natural resource products, and recreational trips involving autos, bicycles and equestrians.[3]
- **Major Collectors** serve several purposes including linking neighborhoods to the regional system of bicycle and automobile streets, and basic transit services. They typically provide direct access between residential and commercial developments, schools and parks and carry higher volumes of traffic then neighborhood streets. Major collector streets are also utilized to access industrial and employment areas and other locations with large truck and over-sized load volumes.[3]

[2] Multnomah County Functional Classification (Policy 34). https://multco.us/transportation-planning/multnomah-county-functional-classification-policy-34. Accessed May 2015.

- **Neighborhood Collectors** provide access primarily to residential land uses and link neighborhoods to higher order roads. They generally have higher traffic volumes than local streets.[3]
- **Local Urban and Rural** provide access to abutting land uses on low traffic volume and low speed facilities. Their primary purpose is to serve local pedestrian, bicycle and automobile trips and limited public transportation use in urban areas; and auto and farm vehicle circulation with local pedestrian, bicycle and equestrian use in rural areas.[3]

Figures 6A and 6B depict the functional classifications of the roadways in the five rural study areas. As shown, the areas are mostly served by collectors and local roadways. Key arterials and state facilities that connect the rural areas to the regional system include I-84, Highway 30, Cornelius Pass Road, Orient Drive, Stark Street, Corbett Hill Road, and Troutdale Road.

Expectations about speed limits generally correspond with the functional classification of the roadway with higher classification (e.g. arterials) having greater speeds and lower classifications (e.g. locals) having lesser speeds. Figures 7A and 7B show the speed limits on roadways within the study area.

Roadway Cross-Section Standards

Expectations about roadway cross-sections are provided for each of the County's functional classifications. These cross-sections identify the required width for pedestrian facilities, bicycle facilities, landscaping/drainage, and number and width of vehicular travel lanes. The cross-section standards typically inform new construction of roadways or roadway modification and modernization projects. Older roadways are typically upgraded to current standards when modified or reconstructed.

The County's current Design and Construction Manual[3] identifies rural roadway design standards. These standards are summarized below in Table 7. The County is in the process of revising these to incorporate context sensitive standards.

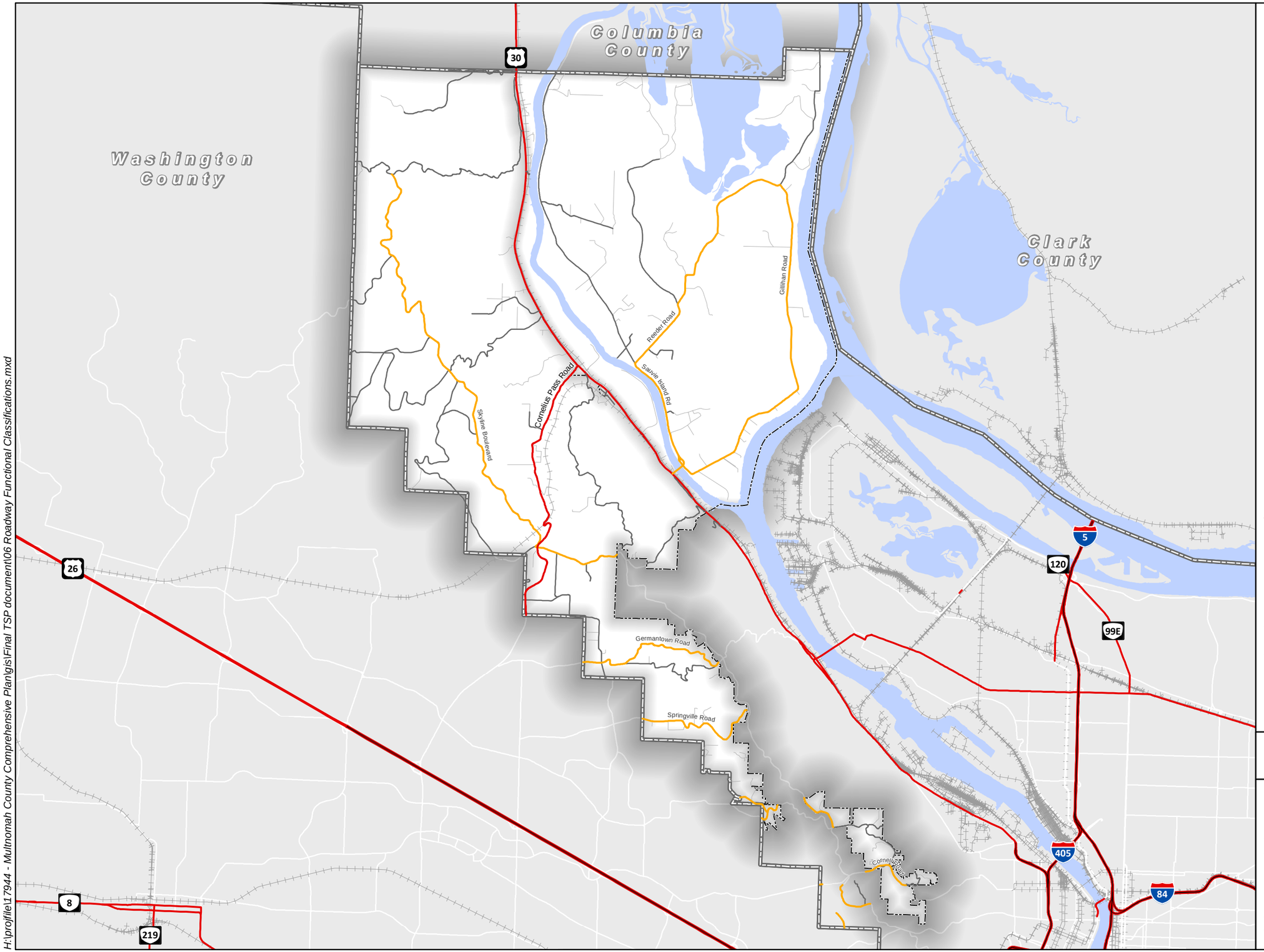
As shown in the Table 7, rural roadways in the County are not currently required to have bike lanes or marked bicycle facilities. The roadway design standards indicate that bicyclists shall be accommodated on the shoulder, when appropriate, based on the facility's traffic volumes. The Design and Construction Manual indicates that shoulders on collectors and arterials should be paved for a minimum of five feet. Rural roadways are also not required to have separate pedestrian facilities. Instead, rural roadway shoulders are typically used by pedestrians, bicycles, oversized vehicles, and for emergency pull-off purposes.

[3] Multnomah County Design and Construction Manual. https://multco.us/file/16499/download.

Multnomah County
Comprehensive Plan

Figure 6A

Roadway Functional Classifications



Roadway Functional Classification (MultCo)

- Intersate / Expressway
- Arterials
- Collectors
- Local
- Local (not maintained by county)
- Railroad (ODOT)
- Plan Areas
- County Boundaries

0 0.5 1 2 Miles

Prepared By:
Kittelson & Associates, Inc.

Date:
8/29/2016

Coordinate System:
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H:\projfile\17944 - Multnomah County Comprehensive Plan\gis\Final TSP document\06 Roadway Functional Classifications.mxd

Multnomah County

Comprehensive Plan

Figure 6B

Roadway Functional Classifications

Clark County

Skamania County

Hood River County

Clackamas County

Marine Drive
223rd Avenue
Halsey Street
Glisan Street
257th/Kane Drive
Stark Street
Troutdale Road
Woodard Road
Hurlburt Road
Evans Road
Division Drive
Oxbow Drive
302nd Avenue
Orient Drive
Lusted Road
Dodge Park Boulevard
Bluff Road
Gordon Creek Road
Lacamas Mountain Road
Bibver Road
Palmquist Road

30
84
212
224
211
26

Roadway Functional Classification (MultCo)

- Intersate / Expressway
- Arterials
- Collectors
- Local
- Local (not maintained by county)
- Railroad (ODOT)
- Plan Areas
- County Boundaries

0 1 2 4 Miles

Prepared By:
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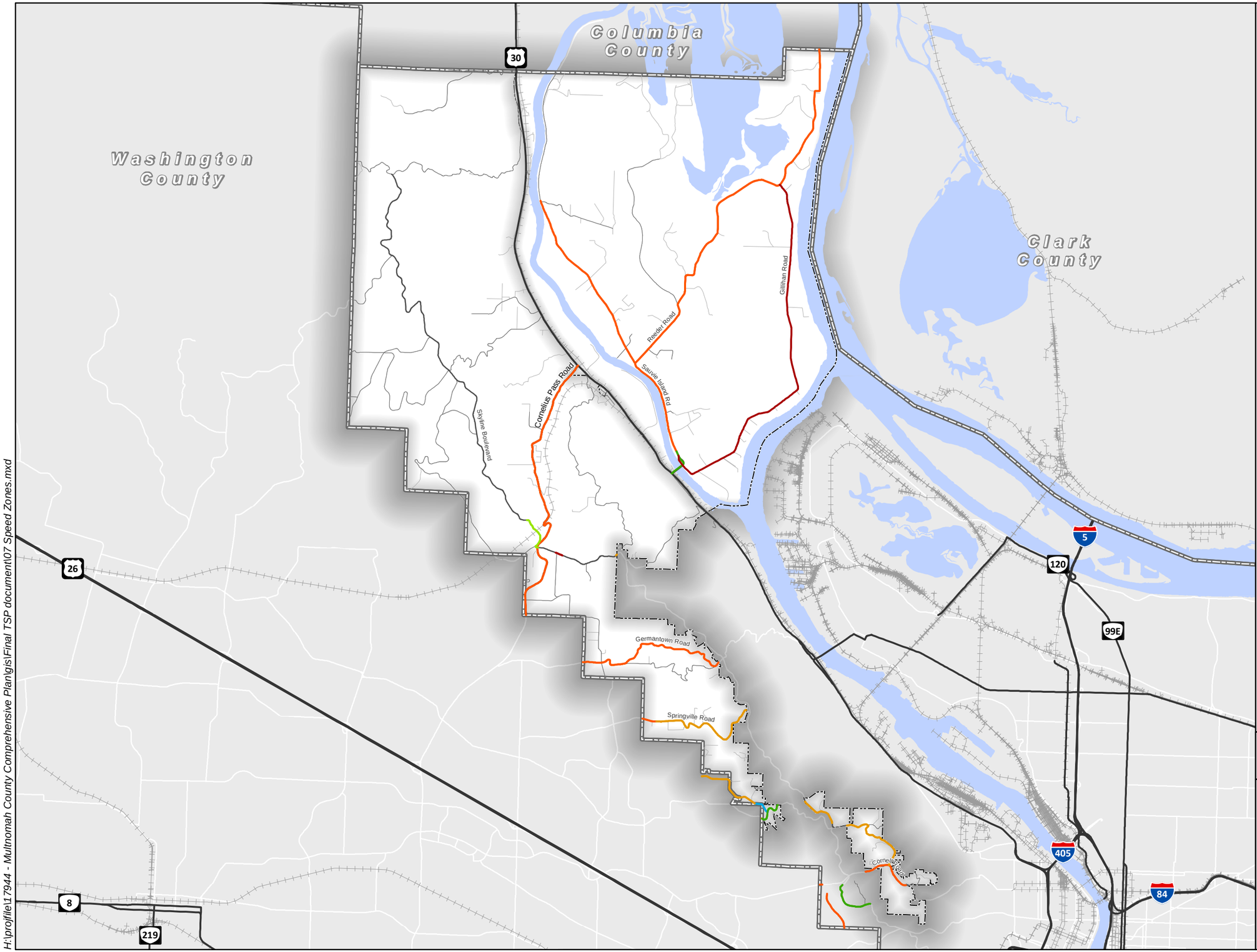

Multnomah County
Comprehensive Plan

Figure 7A
Speed Zones

Speed Zones MPH

- 20
- 25
- 30
- 35
- 40
- 45
- 55

Plan Areas

County Boundaries

0 0.5 1 2 Miles

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Multnomah County
Comprehensive Plan

Figure 7B
Speed Zones

Clark County
Skamania County
Hood River County
Clackamas County

Marine Drive
223rd Avenue
Halsey Street
Glisan Street
257th/Kane Drive
Stark Street
Troutdale Road
Division Drive
302nd Avenue
Oxbow Drive
Orient Drive
Arrow Road
Bluff Road
Dodge Park Boulevard
Lusted Road
Gordon Creek Road
Hurlburt Road
Evans Road
Woodard Road
Blower Road
Larch Mountain Road

84
30
212
224
211
26

Speed Zones MPH

- 20
- 25
- 30
- 35
- 40
- 45
- 55

Plan Areas

County Boundaries

0 1 2 4 Miles

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Table 7 Multnomah County Standards for Typical Rural Sections

Classification	Right-of-Way Width (ft)	Paved Width (ft)	Number of Lanes	Shoulder Width (ft)	Travel Lane Width (ft)
Arterial	60-90	20-55	2-4	6-8 (min. 5 ft. paved)	10-14
Collector	50-80	20-24	2	5-8 (5 ft. paved)	10-12
Local	50-60	20-24	2	5-6	10-12

Paved Width refers to the travel way and does not include shoulders

Figures 8A and 8B show the current width of roadways in the study area including both travel ways and paved shoulders. As shown, most roads are 28 feet or less with many 23 feet or less. This indicates that many of the rural roadways have narrow or no paved shoulders.

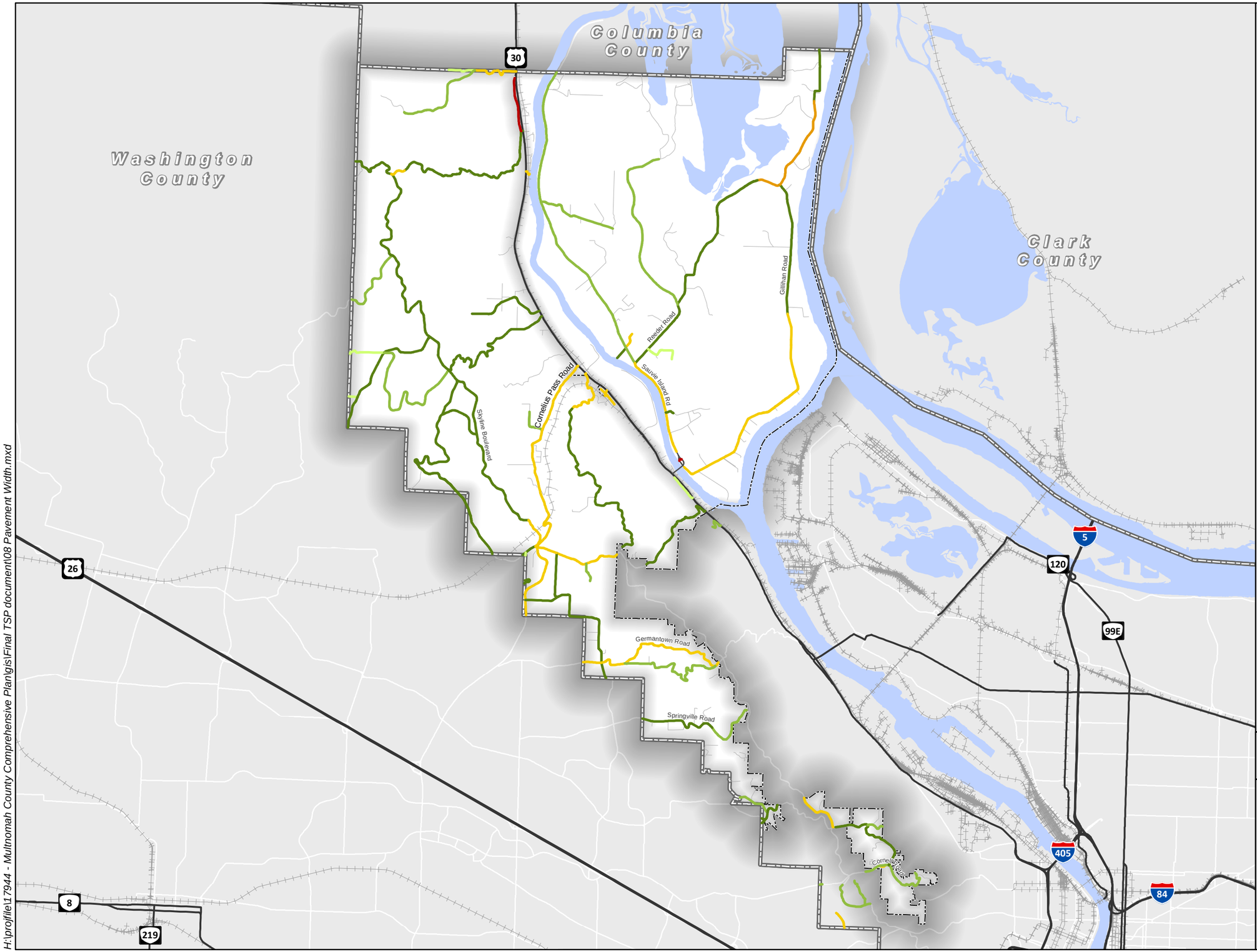
BRIDGES

Within the study areas, the County owns 25 bridges and associated ramps and supporting structures. With the exception of the Willamette River bridges, the majority of the County's bridges are in the rural areas. The locations of the County bridges are shown in Appendix B (Figures 13A and 13B). The County's Capital Improvement Plan identifies the needs for these bridges. The County's Willamette River Bridges are further addressed in detail as part of the Willamette River Bridges Capital Improvement Plan and Program updated in 2015.

ODOT maintains an inventory of bridge conditions within Multnomah County. State, County, and City owned facilities over 20-feet in length are assigned a sufficiency rating based on inspections conducted at regular intervals, usually every two years. The sufficiency rating is a measure between 0 and 100 calculated by the Federal Highway Administration (FHWA), based on factors such as condition, materials, load capacity, and geometry (i.e., dimensions). Structural sufficiency rating data for Multnomah County bridges is summarized in Table 8. Bridge IDs that include letters at the end signify that they are a ramp associated with the main structure. As seen in Table 8, the NW Broadway Ramp over the Broadway Street connection, the Stark Street Bridge, and the Latourell Falls Road Bridge are currently considered structurally deficient.

Table 8 Multnomah County Bridges

Map ID	County Bridge ID	Name	Sufficiency Rating	Sufficiency
1	511	Burnside Bridge	69.1	Not Deficient
1a	511A	West Burnside Approach	40.1	Not Deficient
1b	511B	East Burnside Approach	44.0	Not Deficient
2	2757	Hawthorne Bridge	55.9	Not Deficient
2a	2757A	Hawthorne Blvd Ramp to Hwy 1E SB	58.0	Not Deficient
2b	2757B	SE Madison St Ramp over Hwy 1E SB	61.7	Not Deficient
2c	2757D	Willamette River, SW Hawthorne Blvd	47.6	Not Deficient
2d	2757F	SE Hawthorne Blvd over SE Water Ave	56.9	Not Deficient
3	2758	Morrison Bridge	53.5	Not Deficient
3a	2758A	SE Belmont St over Hwy 1 & Conns	71.7	Not Deficient
3b	2758B	W Morrison Br Conn over Hwy 1W & Park	64.5	Not Deficient
3c	8589 (with 2758)	Willamette R & Hwy 1, SE Morrison St	61.7	Not Deficient
3d	8589Y (with 2758)	SE Yamhill St Ramp over Hwy 1 & Conn	70.0	Not Deficient
4	4522	Beaver Creek Bridge	48.8	Not Deficient
5	6757	Broadway Bridge	58.4	Not Deficient
5a	6757A	NW Broadway Ramp over Broadway St Conn	48.7	Structurally Deficient
5b	6757C	N Broadway St over N Interstate Ave	70.8	Not Deficient
6	21493 (formerly 6879)	Sellwood Bridge	82.0	Not Deficient
7	9321	223rd/Marine Drive Overpass	78.1	Not Deficient
8	11112	Stark Street Bridge	47.9	Structurally Deficient
9	11113	Stark Street Viaduct	86.6	Not Deficient
10	17211	207th Ave over UPRR	98.0	Not Deficient
11	17356	238th Ave over UPRR	91.6	Not Deficient
12	18206	207th over Fairview Creek	97.7	Not Deficient
13	20136	Sauvie Island Bridge	68.0	Not Deficient
14	20722	282nd over Johnson Creek	98.3	Not Deficient
15	25T05	Halsey Street Box Culvert	76.7	Not Deficient
16	25T08	252nd Avenue Bridge	56.2	Not Deficient
17	25T16	Jenne Road/174th Av Bridge	58.9	Not Deficient
18	51C09	Littlepage Rd Box Culvert	71.4	Not Deficient
19	51C10	Latourell Falls Road Bridge	37.0	Structurally Deficient
20	51C12	Smith Road Bridge	96.0	Not Deficient
21	51C13	Gordon Creek Road Viaduct	78.7	Not Deficient
22	51C14	Gordon Creek Bridge	57.0	Not Deficient
23	51C15	Circle Avenue Bridge #1	67.2	Not Deficient
24	51C34	Circle Avenue Bridge #2	69.6	Not Deficient
25	6967A	257th over UPRR	88.9	Not Deficient



Multnomah County
Comprehensive Plan

Figure 8A
Pavement Width

Pavement Widths

- 10 - 17 ft
- 18 - 21 ft
- 22 - 23 ft
- 24 - 25 ft
- 26 - 28 ft
- 30 - 38 ft
- Plan Areas
- County Boundaries

0 0.5 1 2 Miles

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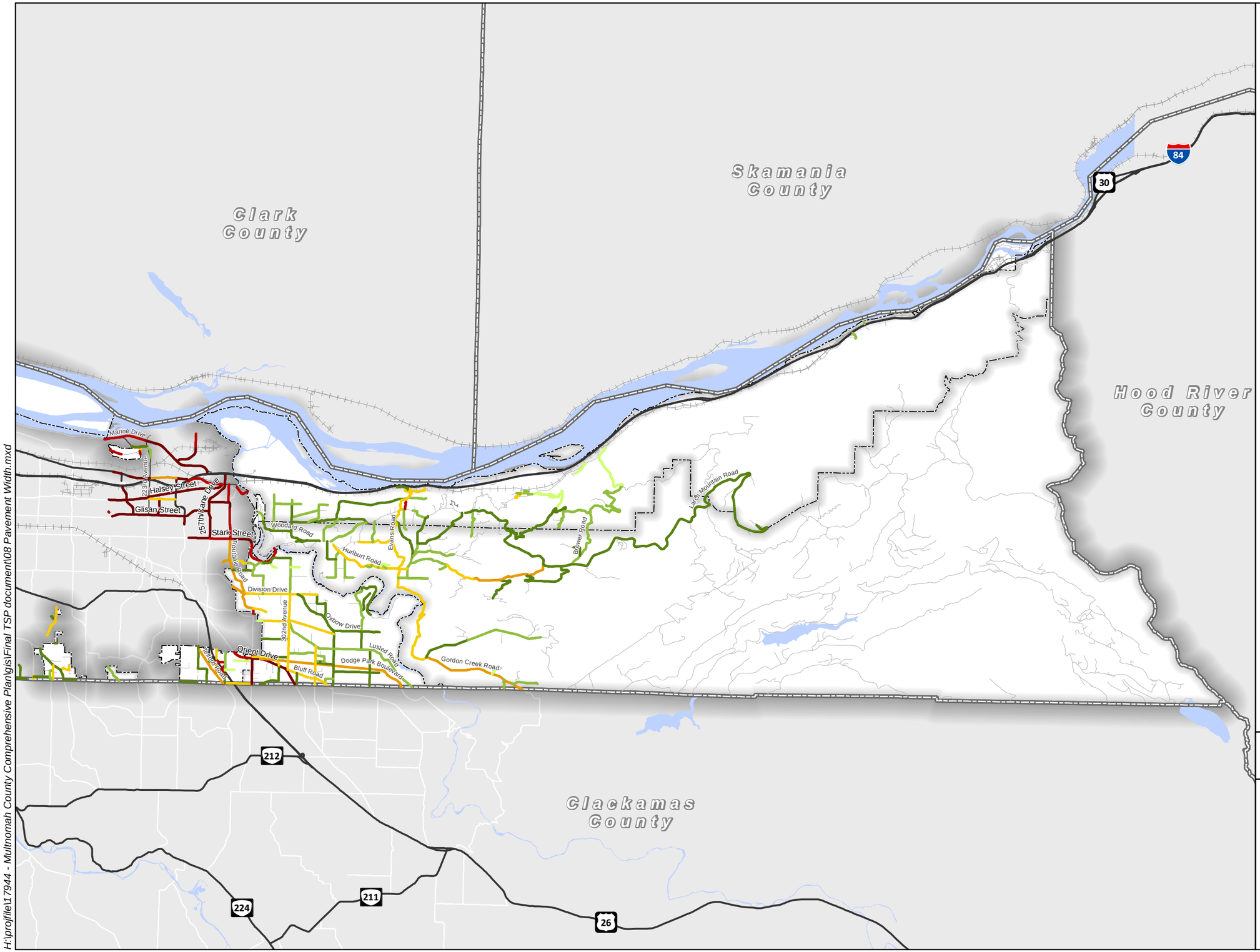

Multnomah County Comprehensive Plan

Figure 8B

Pavement Width

Pavement Widths

- 10 - 17 ft
- 18 - 21 ft
- 22 - 23 ft
- 24 - 25 ft
- 26 - 28 ft
- 30 - 38 ft
- >39 ft
- Plan Areas
- County Boundaries

0 1 2 4 Miles

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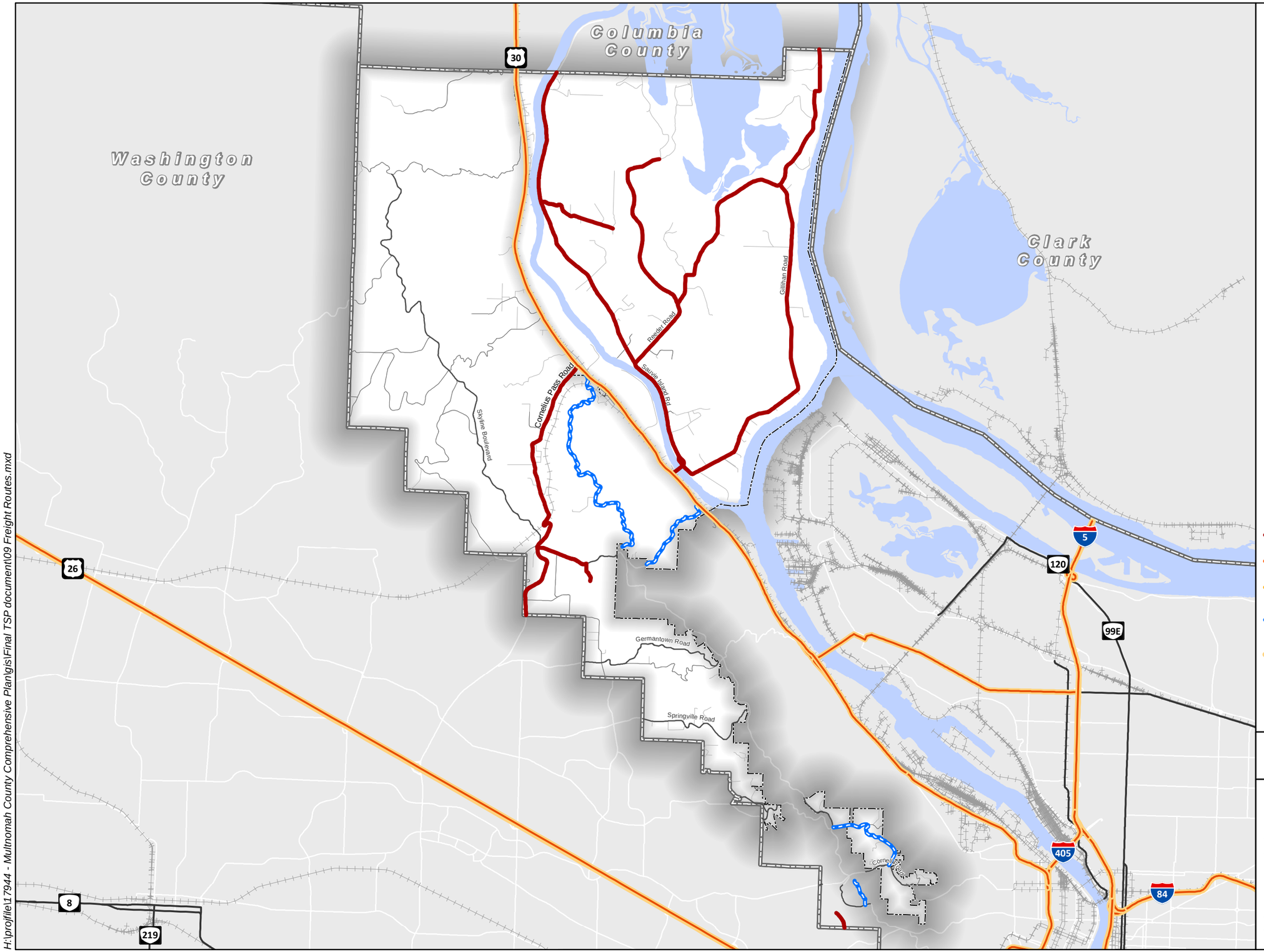
FREIGHT ELEMENT

The freight plan includes a countywide Freight Map that identifies the freight needs in the rural areas and urban areas of Multnomah County. Figures 9A and 9B show County-designated freight routes, including ODOT freight routes and roadways under freight restrictions. Restrictions include roadways limited to 40-foot-long vehicles, to 50-foot-long vehicles, and to local deliveries only. Appendix 2 describes the existing rail and freight system conditions and inventory.



Multnomah County
Comprehensive Plan

Figure 9A

Freight Routes

- No Additional Restrictions
- Limited to 40 ft. Overall Length
- Limited to 50 ft. Overall Length
- Through Trucks Prohibited, Local Deliveries Only
- ODOT Freight Routes
- Plan Areas
- County Boundaries

0 0.5 1 2 Miles

Prepared By:
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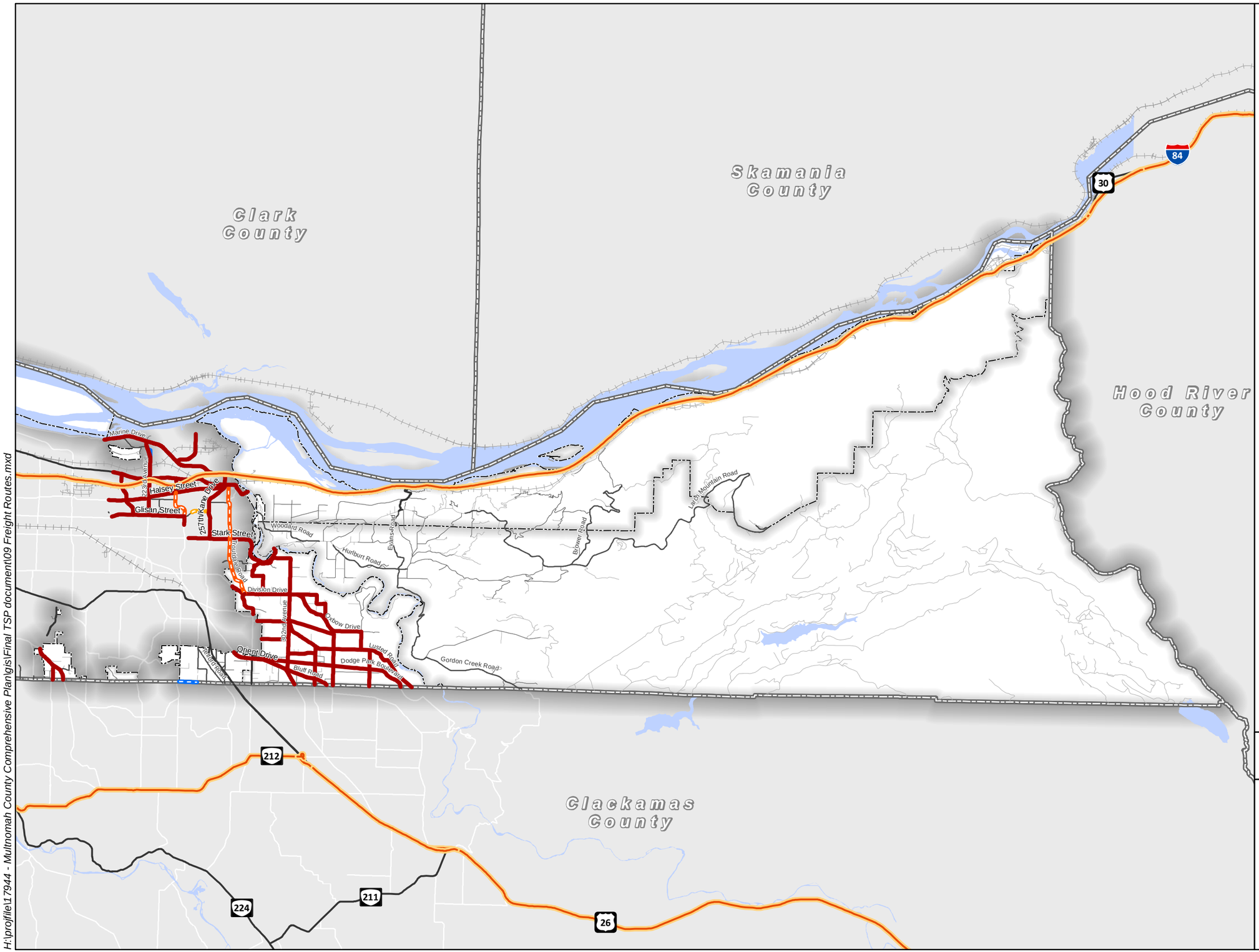

Multnomah County
Comprehensive Plan

Figure 9B
Freight Routes

- No Additional Restrictions
- Limited to 40 ft. Overall Length
- Limited to 50 ft. Overall Length
- Through Trucks Prohibited, Local Deliveries Only
- ODOT Freight Routes
- Plan Areas
- County Boundaries

0 1 2 4 Miles

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PEDESTRIAN AND BICYCLE ELEMENT

The pedestrian and bicycle plan includes a countywide Roadway Bicycle Designation map as well as projects to address the needs of bicycles and pedestrians in the rural areas (see Figures 10A and 10B).

Pedestrian needs within the rural areas are primarily addressed through the addition of shoulders that serve pedestrians and bicyclists or through shared use paths. In rural areas, the shoulders are the primary facility available to pedestrians.

The Roadway Bicycle Designation map illustrates the roadway bicycle designations for all County and ODOT facilities. The designations help define the type of bicycle facility planned for each roadway. The three designations are described below.

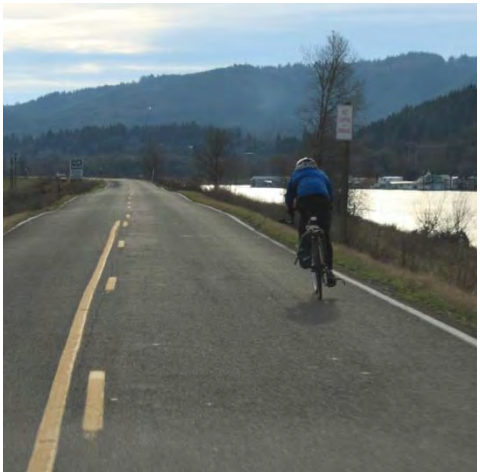
Non-Designated Routes

Non-Designated Routes are roads without bicycle facilities that are not signed or designated bicycle routes; however, bicycles may still use these routes.

Shared Roadway

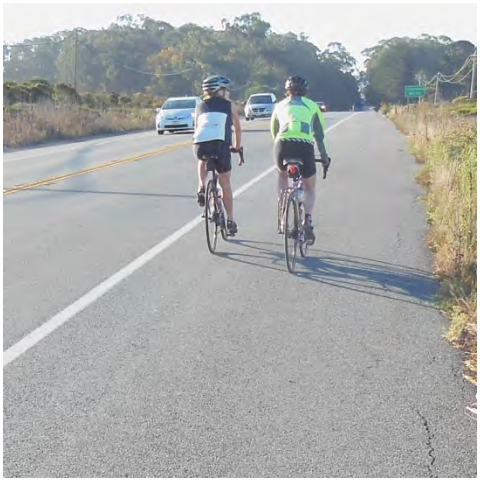
Shared Roadways are roads without bicycle facilities that are designated bicycle routes. This designation may influence how the County signs, maintains, or makes other decisions with regard to these facilities.

Shared Roadways could have signage indicating a bike route. Bicyclists share the lane with vehicles on shared roadways. Shared roadways are common on low volume rural roads and highways and may, or may not, include “sharrows” (pavement marking that indicate the shared use of the roadway).

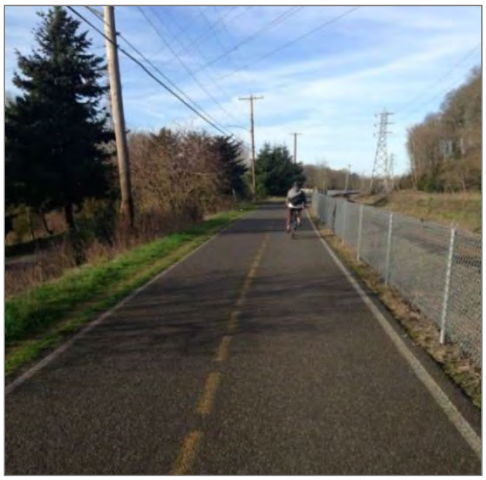


Bikeway

Multnomah County's current roadway standards require 5-8 foot shoulders depending on the roadway functional classification with a minimum of 5-feet paved shoulders on all roadways. Shoulder bikeway designated routes should provide space for cyclists to travel outside of the vehicle travel lane where warranted by prevailing conditions and traffic volumes. This could be accomplished by including continuous shoulder bikeways on both sides of the roadway ranging from 3-foot to 6-foot wide, depending upon the rural character of the area, but could also include uphill climbing lanes only, intermittent shoulders in low visibility areas, or bike pull-out areas. Shoulder bikeway designated routes typically have higher vehicular speeds and traffic volumes than routes where a shared roadway designation would be appropriate in both directions for the entire length of the roadway. Shoulder facilities also benefit pedestrians in rural areas.



Shared-use paths are separated from the roadway by an open space or barrier. Shared-use paths are typically used by pedestrians and bicyclists as two-way facilities. Such paths can also be constructed on alignments separate from roadways to create more direct routes between destinations and also serve as elements of a recreational trail system.



Multnomah County
Comprehensive Plan

Figure 10A

Roadway Bicycle Designations

Columbia County

Clark County

Washington County

Watson Road
Gilkison Road
Rocky Point Road
Sauvie Island Road
Lucy Reeder Road
Reeder Road
Oak Island Road
Gillihan Road
Morgan Road
Logie Trail Road
Johnson Road
Beck Road
Elliott Road
Skyline Boulevard
Cornelius Pass Road
McNamee Road
Rock Creek Road
Sauvie Island Rd
Newberry Road
Brooks Road
Kaiser Road
Germantown Road
Old Germantown Road
Springville Road
Thompson Road
Cornelius Pass Rd

30
26
120
99E
5
405
84

Bikeways (in light orange) are designated bike routes that may have bike lanes, shoulder bikeways, or uphill climbing lanes, intermittent shoulders in low visibility areas, or bike pull-out areas. Bikeways tend to be on roadways with higher speeds and traffic volumes where a shared roadway would be inappropriate in both directions for the entire length of the roadway.

Shared Roadways (in light green) are designated bike routes that could have signage indicating a bike route; bicyclist share the lane with vehicles on shared roadways. Shared roadways are common on low volume rural roads and highways and may, or may not, include "sharrows" (pavement marking that indicate the shared use of the roadway).

- Existing On-Street Bike Facility
- Multi-Use Paths
- Proposed Bikeways
- Proposed Shared Roadways
- Proposed Off-Street Bikeways
- County Boundaries
- Plan Areas

0 0.5 1 2 Miles

Prepared By:
Kittelson & Associates, Inc.

Date:
8/29/2016

Coordinate System:
NAD 1983 HARN State Plane Oregon North FIPS 3601

Disclaimer:
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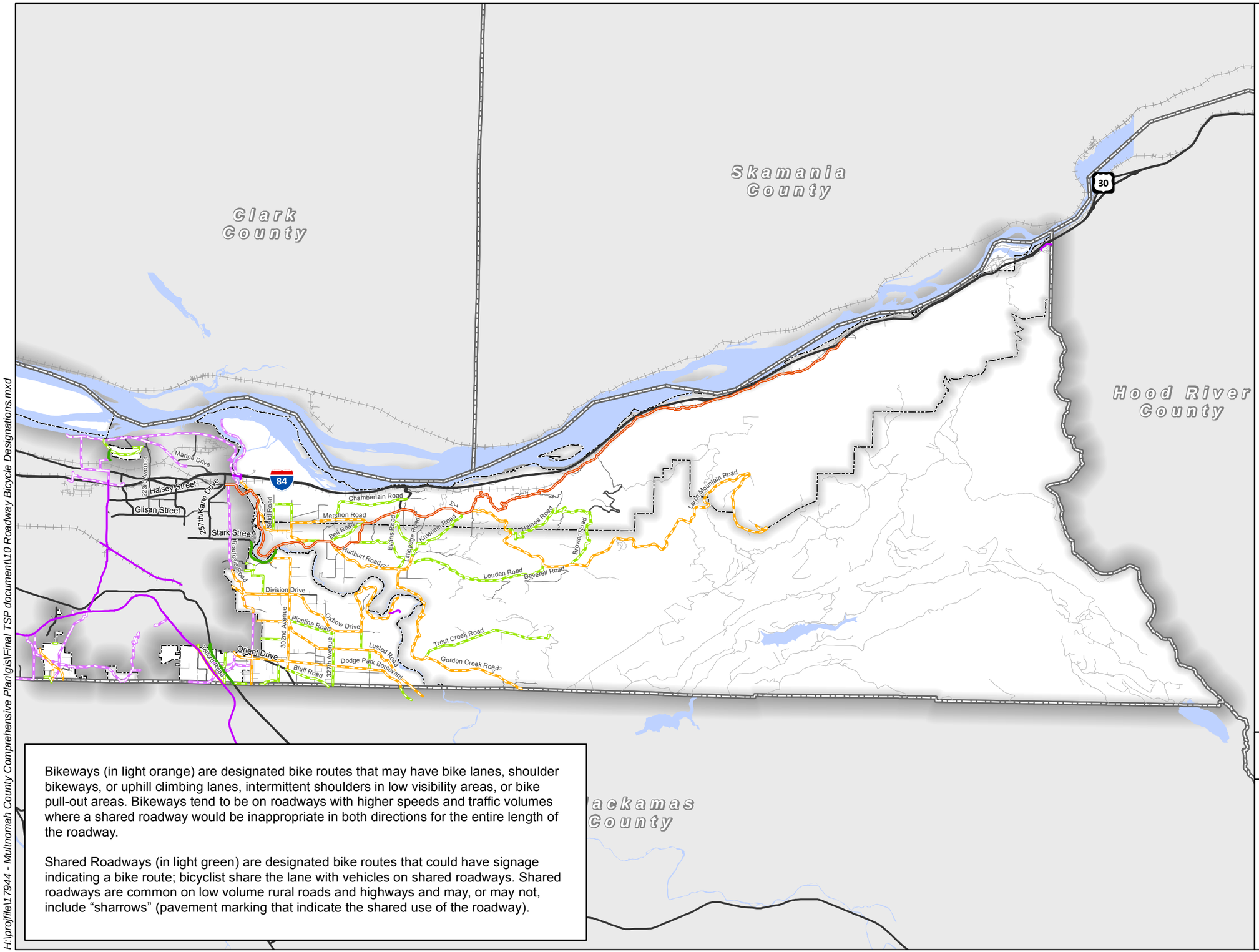
H:\profile\17944 - Multnomah County Comprehensive Plan\gis\Final TSP document\10 Roadway Bicycle Designations.mxd



Bikeways (in light orange) are designated bike routes that may have bike lanes, shoulder bikeways, or uphill climbing lanes, intermittent shoulders in low visibility areas, or bike pull-out areas. Bikeways tend to be on roadways with higher speeds and traffic volumes where a shared roadway would be inappropriate in both directions for the entire length of the roadway.

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Multnomah County
Comprehensive Plan

Figure 10B

Roadway Bicycle Designations

- Existing On-Street Bike Facility
- Multi-Use Paths
- Proposed Bikeways
- Proposed Shared Roadways
- Proposed Off-Street Bikeways
- Historic Columbia River Highway
- County Boundaries
- Plan Areas

0 1 2 4 Miles

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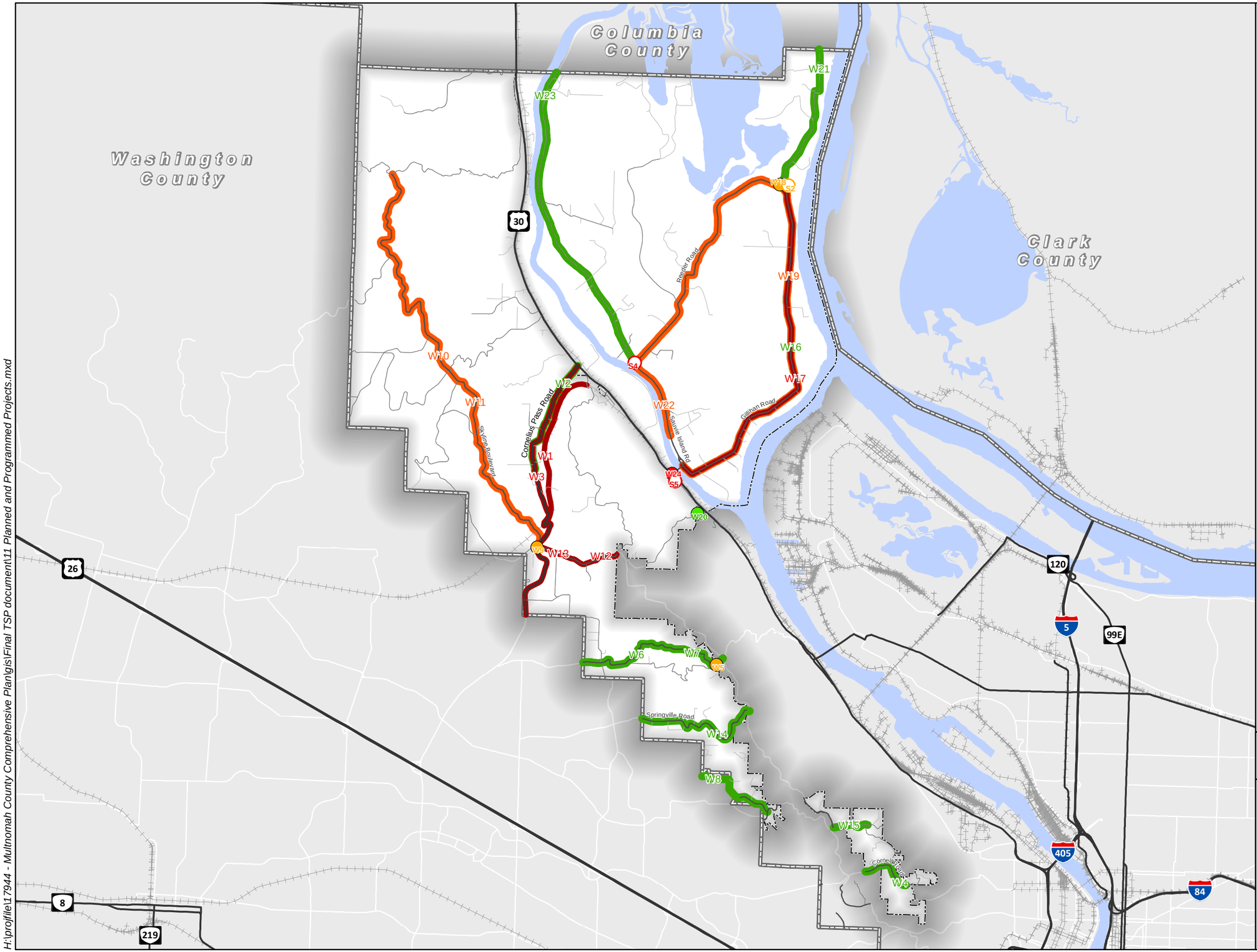
IMPROVEMENT PROJECTS

Two community workshops and multiple CAC subcommittee meetings provided feedback on the potential range of solutions in Section 3 and informed a 20-year list of programs and policies for TSP implementation. The resulting set of solutions intends to help manage traffic and ensure safe multimodal travel in the rural areas of Multnomah County during the next 20 years. The projects are categorized into one of three groups: high, medium, and low priority. High priority projects include those to be addressed within the next five years or as funding allows. Mid-term projects could be addressed within the next six to ten years, depending on funding and local priorities. Long-term could be addressed within 11 to 20 years; however, the County's current funding sources will only allow for funding of the high-priority projects over the next 20 years. Figure 11A and 11B and Tables 9 and 10 illustrate the project list.

Project priorities were developed through an iterative process. Every project was first ranked in several different categories including safety and crash history, bicycle route designation, roadway functional classification, average daily traffic, proximity to activity centers and destinations, pavement condition, and project cost. These rankings were combined to find a project priority score, which was used to group the projects into the three priority categories (high, medium, low). These initial project priorities were then adjusted based on committee and public input. The project priorities shown below reflect current sentiment of the CAC but are not binding. The priorities may vary over time and are dynamic.



Multnomah County
Comprehensive Plan

Figure 11A

Planned and Programmed Projects

Intersections

- High Priority Project
- Medium Priority Project
- Low Priority Project
- High Priority Study
- Medium Priority Study

Segments

- High Priority Project
- Medium Priority Project
- Low Priority Project
- Medium Priority Study
- Low Priority Study
- Plan Areas
- County Boundaries

0 0.5 1 2 Miles

Prepared By:
Kittelson & Associates, Inc.

Date:
8/29/2016

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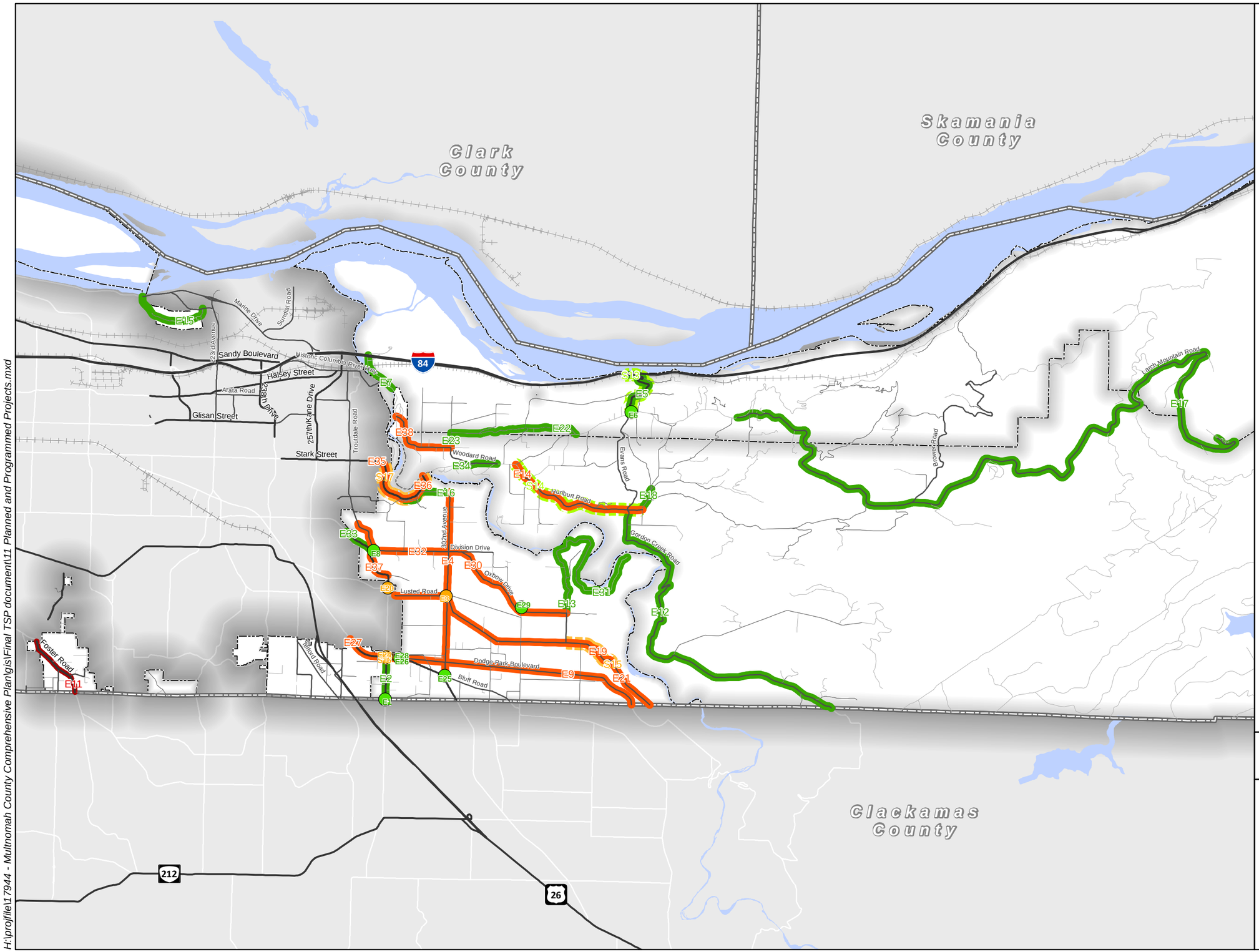
Multnomah County
Comprehensive Plan

Figure 11B

Planned and Programmed Projects



Intersections

- High Priority Project
- Medium Priority Project
- Low Priority Project
- High Priority Study
- Medium Priority Study

Segments

- High Priority Project
- Medium Priority Project
- Low Priority Project
- Medium Priority Study
- Low Priority Study
- Plan Areas
- County Boundaries

0 0.75 1.5 3 Miles

Prepared By:
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8/29/2016

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Table 9 Planned and Programmed Projects

Project Number	Project Location	Project Description	Priority	Cost
West County: West Hills				
W1	Burlington Northern Trail: Cornelius Pass Rd to McNamee Rd	County does not manage or develop trails. Work with partners to study the conversion of Burlington Northern railroad corridor parallel to Cornelius pass Road to a mixed-use trail.	high	$$$
W2	Cornelius Pass Road: (old) St. Helens Road to MP 2	This project is only to be pursued if the Burlington Northern Trail does not move forward. Provide separation for bicycles where warranted and/or feasible. Improvements could include narrow shoulders (3-4 feet) to full width shoulders (6 feet) in one or both directions or could include minimal improvements such as uphill bicycle climbing lanes or intermittent bicycle pull-outs.	low	$$$
W3	Cornelius Pass Road: US 30 to County Line	Safety improvements - 8th Avenue; S curves; Boyd's lower driveway; curves south of Plainview; Kaiser Road signage, clearing, and flashing beacons; corridor signage; vehicle pullouts; barrier and guardrail upgrades; reduce pavement drop offs; variable message signs. If applicable, tie into wayfinding signage that lets bicyclists know that Old Cornelius Pass Rd is a lower volume option.	high	$$$
W4	Cornell Road: UGB TO UGB	Provide separation for bicycles where warranted and/or feasible. Improvements could include narrow shoulders (3-4 feet) to full width shoulders (6 feet) in one or both directions or could include minimal improvements such as uphill bicycle climbing lanes or intermittent bicycle pull-outs. Solutions can be used for pedestrian use (i.e. shoulders).	low	$$$
W5	Germantown Road/Old Germantown Road	Widen Germantown Road to create southwest bound left turn pocket and improve sight distance.	medium	$$$
W6	Germantown Road: Skyline Boulevard to County Line	Provide safety improvements such as augmenting shoulders in a context-sensitive manner.	low	$$$
W7	Germantown Road: Skyline Boulevard to County Line	Safety spot improvements – Widen lanes on curves only, install center skip like reflective markers, and install mirror at intersection with Old Germantown Road. Install Dynamic Curve Speed Warning System. Two flashing speed signs each direction on Germantown Rd west of Skyline Blvd between mileposts 2.5-3.5. Install traffic calming devices to reduce speeds.	low	$$
W8	Laidlaw Road: McDaniel Rd to Saltzman Rd	Provide safety improvements such as augmenting shoulders in a context-sensitive manner.	low	$$$
W20	Newberry Road	Safety spot improvement – Install guardrail ¼ mile south of US 30 and identify if there is a speeding concern and if so, install countermeasures 1.2 miles from US 30.	low	$
W9	Skyline Boulevard/Cornelius Pass Road	Cornelius Pass Road intersection improvements – install signal, provide westbound left-turn lane and through/right lane on Skyline Boulevard.	medium	$$
W10	Skyline Boulevard: Beck Road to Rocky Point Road	Provide safety improvements such as augmenting shoulders in a context-sensitive manner.	medium	$$$
W11	Skyline Boulevard: Cornelius Pass Road to Beck Road	Provide safety improvements such as augmenting shoulders in a context-sensitive manner.	medium	$$$
W12	Skyline Boulevard: UGB to Cornelius Pass Road	Provide safety improvements such as augmenting shoulders in a context-sensitive manner.	high	$$$

W13	Skyline Boulevard: UGB to Cornelius Pass Road	Safety improvement – Install traffic calming devices to reduce speeds to be consistent with outcome of future speed zone study (Project S1) from UGB to Cornelius Pass Road.	high	$$
W14	Springville Road: UGB to County Line	Provide safety improvements such as augmenting shoulders in a context-sensitive manner. Also consistent with on-street bike/ped option in the Westside Trail Master Plan	low	$$$
W15	Thompson Road: 53rd Dr to UGB	Provide safety improvements such as augmenting shoulders in a context-sensitive manner.	low	$$$
West County: SIMC				
W16	Gillihan Road Curve Improvements: Sauvie Island Rd to Reeder Rd	Provide warning signs and delineation posts on curves along the loop roads.	high	$
W17	Gillihan Road Signage Improvements: Sauvie Island Rd to Reeder Rd	Install speed limit signs on unsigned sections of Gillihan Road.	high	$
W18	Gillihan Road/Reeder Road Intersection Upgrades	Implement a three-way stop control at the intersection of Gillihan Road and Reeder Road to be consistent with outcome of future intersection study (Project S2).	medium	$
W19	Loop Road Shoulder Improvements	Provide 3-4 foot paved shoulders on the loop roads including Reeder Road, Sauvie Island Road, and Gillihan Road.	medium	$$$
	Line intentionally left blank.			
W21	Reeder Road Shoulder Improvements: Gillihan Rd to County Line	Provide separation for bicycles where warranted and/or feasible on Reeder Road from Gillihan Road to the Columbia County line. Improvements could include narrow shoulders (3-4 feet) to full width shoulders (6 feet) in one or both directions or could include minimal improvements such as uphill bicycle climbing lanes or intermittent bicycle pull-outs. Solutions can be used for pedestrian use (i.e. shoulders).	low	$$$
W22	Sauvie Island Road Multi-Use Path	Construct multi-use path parallel to sections of Sauvie Island Road located on the levee.	medium	$$$
W23	Sauvie Island Road Shoulder Improvements: Reeder Rd to County Line	Provide separation for bicycles where warranted and/or feasible on Sauvie Island Road from Reeder Road to the Columbia County line. Improvements could include narrow shoulders (3-4 feet) to full width shoulders (6 feet) in one or both directions or could include minimal improvements such as uphill bicycle climbing lanes or intermittent bicycle pull-outs. Solutions can be used for pedestrian use (i.e. shoulders).	low	$$$
W24	US 30/Sauvie Island Road Intersection Upgrades	Upgrade the traffic signal controller at the intersection of US 30 and Sauvie Island Road to be consistent with outcome of future intersection upgrade study (Project S5).	high	$
W25	Advisory Bike Lane Pilot Project	Implement advisory lane pilot test project to be consistent with outcome of future advisory lane test study (Project S6). The project will temporarily implement an advisory lane and be monitored for compliance and use.	low	$
W26	Event Permit Calendar	Develop event permit calendar and implement use.	high	$
W27	Sauvie Island and Multnomah Channel (SIMC) Bike Map	Work with Sauvie Island Community Association (SICA) and other Sauvie Island stakeholders to develop a bike map that includes wayfinding and education	high	$
W28	Sauvie Island Mobile Speed Radar Implementation	Obtain a mobile speed radar unit for Sauvie Island that can be relocated at regular intervals.	low	$
W29	Sauvie Island Speed Photo Radar Implementation	Implement permanent speed photo radar signs at several locations on Sauvie Island.	low	$

W30	Sauvie Island Speed Photo Radar Ticketing Implementation	Implement photo radar ticketing at several locations on Sauvie Island	low	$$$
W31	Share the Road Improvements	Install warning/advisory signs are to inform motorists of bicycles and farm equipment sharing the road along facilities (all roads under existing conditions)	high	$
W32	SIMC Travel Demand Management Plan	Develop a Travel Demand Management Plan for the island that further explores each of the potential TDM strategies and explores and identifies a potential Transportation Management Association (TMA) for Sauvie Island. Elements of the TDM plan should include input from study projects S3, S7-S10, and S12).	high	$
W33	SIMC Wayfinding Upgrades	Install additional wayfinding to provide guidance to motorized and non-motorized users to areas of interest such as types and location of recreation, parking, and other key destinations.	high	$
East County				
E1	282nd Avenue/Stone Road Turn Lanes	The addition of right turn channelization lanes in the northbound and southbound direction on 282nd would reduce the high incidence of rear end crashes at this location. Some roadway widening would be necessary.	low	$$
E2	282nd Avenue: Orient to County Line	Provide separation for bicycles where warranted and/or feasible. Improvements could include narrow shoulders (3-4 feet) to full width shoulders (6 feet) in one or both directions or could include minimal improvements such as uphill bicycle climbing lanes or intermittent bicycle pull-outs. Solutions can be used for pedestrian use (i.e. shoulders).	low	$$$
E3	302nd Avenue/Lusted Road	Realign Lusted Road and Pipeline Road to create perpendicular intersection at 302nd, add left turn lane to each leg of intersection.	medium	$$$
E4	302nd Avenue: Kerslake to Bluff	Provide separation for bicycles where warranted and/or feasible. Improvements could include narrow shoulders (3-4 feet) to full width shoulders (6 feet) in one or both directions or could include minimal improvements such as uphill bicycle climbing lanes or intermittent bicycle pull-outs. Solutions can be used for pedestrian use (i.e. shoulders).	medium	$$$
E5	Corbett Hill Road Safety Improvements	Implement safety improvements from future Corbett Hill Road Safety Study (Project S13).	low	$$$
E6	Corbett Hill Road/Historic Columbia River Highway	Improve intersection alignment by making stops at right angle.	low	$$$
E7	Corbett Hill Road: I-84 to HCRH	Provide separation for bicycles where warranted and/or feasible. Improvements could include narrow shoulders (3-4 feet) to full width shoulders (6 feet) in one or both directions or could include minimal improvements such as uphill bicycle climbing lanes or intermittent bicycle pull-outs. Solutions can be used for pedestrian use (i.e. shoulders).	low	$$$
E8	Division Drive/Troutdale Road	Realign intersection, eliminating NE leg, producing a 4-way intersection. Replace 3 existing culverts identified as fish barriers.	low	$$$
E9	Dodge Park Boulevard: Orient to County Line	Provide separation for bicycles where warranted and/or feasible. Improvements could include narrow shoulders (3-4 feet) to full width shoulders (6 feet) in one or both directions or could include minimal improvements such as uphill bicycle climbing lanes or intermittent bicycle pull-outs. Solutions can be used for pedestrian use (i.e. shoulders).	medium	$$$
E10	Line intentionally left blank.			

E11	Foster Road: Jenne to County Line	Provide separation for bicycles where warranted and/or feasible. Improvements could include narrow shoulders (3-4 feet) to full width shoulders (6 feet) in one or both directions or could include minimal improvements such as uphill bicycle climbing lanes or intermittent bicycle pull-outs. Solutions can be used for pedestrian use (i.e. shoulders). See also Springwater Master Plan Transportation System Plan (September 2005, Gresham).	high	$$$
E12	Gordon Creek Road	Provide separation for bicycles where warranted and/or feasible. Improvements could include narrow shoulders (3-4 feet) to full width shoulders (6 feet) in one or both directions or could include minimal improvements such as uphill bicycle climbing lanes or intermittent bicycle pull-outs. Solutions can be used for pedestrian use (i.e. shoulders).	low	$$$
E13	Hosner Road: Hosner Terrace to Oxbow Park Road SE	Provide separation for bicycles where warranted and/or feasible. Improvements could include narrow shoulders (3-4 feet) to full width shoulders (6 feet) in one or both directions or could include minimal improvements such as uphill bicycle climbing lanes or intermittent bicycle pull-outs. Solutions can be used for pedestrian use (i.e. shoulders).	low	$$$
E14	Hurlburt Road: HCRH to Littlepage Road	Provide separation for bicycles where warranted and/or feasible. Improvements could include narrow shoulders (3-4 feet) to full width shoulders (6 feet) in one or both directions or could include minimal improvements such as uphill bicycle climbing lanes or intermittent bicycle pull-outs. Solutions can be used for pedestrian use (i.e. shoulders).	medium	$$$
E15	Interlachen Lane: Marine Dr to Blue Lake Rd	Add sidewalks to both sides	low	$$$
E16	Kerslake Road: Wilson to 302nd	Provide separation for bicycles where warranted and/or feasible. Improvements could include narrow shoulders (3-4 feet) to full width shoulders (6 feet) in one or both directions or could include minimal improvements such as uphill bicycle climbing lanes or intermittent bicycle pull-outs. Solutions can be used for pedestrian use (i.e. shoulders).	low	$$$
E17	Larch Mt. Road: HCRH to end of county road	Provide separation for bicycles where warranted and/or feasible. Improvements could include narrow shoulders (3-4 feet) to full width shoulders (6 feet) in one or both directions or could include minimal improvements such as uphill bicycle climbing lanes or intermittent bicycle pull-outs. Solutions can be used for pedestrian use (i.e. shoulders).	low	$$$
E18	Littlepage Road: Hurlburt to Knieriem	Provide separation for bicycles where warranted and/or feasible. Improvements could include narrow shoulders (3-4 feet) to full width shoulders (6 feet) in one or both directions or could include minimal improvements such as uphill bicycle climbing lanes or intermittent bicycle pull-outs. Solutions can be used for pedestrian use (i.e. shoulders).	low	$$$
E19	Lusted Road Safety Improvements	Implement safety improvements from future Lusted Road Safety Study (Project S15).	medium	$$$
E20	Lusted Road/Powell Valley Road/282nd Avenue Consolidation	Realignment to connect SE Lusted Road directly with SE Powell Valley Road is included in the County's Capital Improvement Plan and Program. The project would require further engineering analysis and coordination with the City of Gresham to develop a recommend alignment. A traffic signal is warranted based on projected 2020 PM peak hour volumes, and would provide LOS B operations.	medium	$$$

E21	Lusted Road: 282nd to County line	Provide separation for bicycles where warranted and/or feasible. Improvements could include narrow shoulders (3-4 feet) to full width shoulders (6 feet) in one or both directions or could include minimal improvements such as uphill bicycle climbing lanes or intermittent bicycle pull-outs. Solutions can be used for pedestrian use (i.e. shoulders).	medium	$$$
E22	Mershon Road: Ogden to HCRH	Provide separation for bicycles where warranted and/or feasible. Improvements could include narrow shoulders (3-4 feet) to full width shoulders (6 feet) in one or both directions or could include minimal improvements such as uphill bicycle climbing lanes or intermittent bicycle pull-outs. Solutions can be used for pedestrian use (i.e. shoulders).	low	$$$
E23	Ogden Road: Mershon to Woodard	Provide separation for bicycles where warranted and/or feasible. Improvements could include narrow shoulders (3-4 feet) to full width shoulders (6 feet) in one or both directions or could include minimal improvements such as uphill bicycle climbing lanes or intermittent bicycle pull-outs. Solutions can be used for pedestrian use (i.e. shoulders).	low	$$$
E24	Orient Drive/282nd Avenue Safety Improvements	Implement safety improvements from future Orient Drive/282nd Avenue Safety Study (Project S16).	medium	$$$
E25	Orient Drive/Bluff Road	Widen Orient Drive to create eastbound left turn lane to Bluff Road, realign Bluff and Teton to create perpendicular intersection.	low	$$$
E26	Orient Drive/Dodge Park Boulevard	Widen Orient Drive to create eastbound left turn lane.	low	$$
E27	Orient Drive: Welch Road to Dodge Park Boulevard	Provide separation for bicycles where warranted and/or feasible. Improvements could include narrow shoulders (3-4 feet) to full width shoulders (6 feet) in one or both directions or could include minimal improvements such as uphill bicycle climbing lanes or intermittent bicycle pull-outs. Solutions can be used for pedestrian use (i.e. shoulders).	medium	$$$
E28	Orient Drive/Dodge Park Boulevard Realignment	Realign the intersection to create a more perpendicular angle. Driveway modifications would be required to serve the auto body shop in the northwest quadrant of the intersection.	low	$$$
E29	Oxbow Drive/327th Avenue/Altman Road Realignment	Channelizing the broad paved area on SE 327th Avenue at the approach to SE Oxbow Drive to create a more perpendicular intersection is recommended to improve sight distance and reduce the potential for conflict between westbound left turns and northbound left turns. Widen Oxbow Drive to create westbound left turn lane to Altman Road/327th Avenue.	low	$$$
E30	Oxbow Drive: Division Drive to Hosner Road	Provide separation for bicycles where warranted and/or feasible. Improvements could include narrow shoulders (3-4 feet) to full width shoulders (6 feet) in one or both directions or could include minimal improvements such as uphill bicycle climbing lanes or intermittent bicycle pull-outs. Solutions can be used for pedestrian use (i.e. shoulders).	medium	$$$
E31	Oxbow Parkway: Hosner Road to Road End	Provide separation for bicycles where warranted and/or feasible. Improvements could include narrow shoulders (3-4 feet) to full width shoulders (6 feet) in one or both directions or could include minimal improvements such as uphill bicycle climbing lanes or intermittent bicycle pull-outs. Solutions can be used for pedestrian use (i.e. shoulders).	low	$$$

E32	SE Division Drive: Troutdale to Oxbow Parkway	Provide separation for bicycles where warranted and/or feasible. Improvements could include narrow shoulders (3-4 feet) to full width shoulders (6 feet) in one or both directions or could include minimal improvements such as uphill bicycle climbing lanes or intermittent bicycle pull-outs. Solutions can be used for pedestrian use (i.e. shoulders).	medium	$$$
E33	SE Division Drive: UGB to Troutdale Road	Provide separation for bicycles where warranted and/or feasible. Improvements could include narrow shoulders (3-4 feet) to full width shoulders (6 feet) in one or both directions or could include minimal improvements such as uphill bicycle climbing lanes or intermittent bicycle pull-outs. Solutions can be used for pedestrian use (i.e. shoulders).	low	$$$
E34	SE Nielson Road - SE Woodward Road Bicycle Detour	Install signage to encourage cyclists to use SE Nielson Road - SE Woodard Road as a detour to the adjacent segment of Historic Columbia River Highway with curves and no shoulders.	low	$
E35	Stark St: City Limit to 35th St	Add pedestrian improvement to south side from City limits to 35th Street. Pedestrian facility type and width may vary throughout the corridor depending upon the context available, ROW, and context.	high	$
E36	Stark Street Safety Improvements	Implement safety improvements from future Stark Street Safety Study (Project S17).	medium	$$$
E37	Troutdale Road: Strebin Road to 282 Avenue	Provide separation for bicycles where warranted and/or feasible. Improvements could include narrow shoulders (3-4 feet) to full width shoulders (6 feet) in one or both directions or could include minimal improvements such as uphill bicycle climbing lanes or intermittent bicycle pull-outs. Solutions can be used for pedestrian use (i.e. shoulders).	medium	$$$
E38	Woodard Road: HCRH to Ogden Road	Provide separation for bicycles where warranted and/or feasible. Improvements could include narrow shoulders (3-4 feet) to full width shoulders (6 feet) in one or both directions or could include minimal improvements such as uphill bicycle climbing lanes or intermittent bicycle pull-outs. Solutions can be used for pedestrian use (i.e. shoulders).	medium	$$$
E39	Sandy River to Springwater multi-modal connection	Partner with City of Gresham, Metro and other regional partners to construct the Sandy to Springwater Multi-modal Corridor according to the Master Plan to be developed in 2016	low	$$$
	Line intentionally left blank.			
County-wide				
C1	Wayfinding Upgrades	Install additional wayfinding to provide guidance to motorized and non-motorized users to areas of interest such as types and location of recreation, parking, and other key destinations.	medium	$

Table 10 Planned and Programmed Study Projects

Project Number	Project Location	Project Description	Priority	Cost
West County: West Hills				
S1	Skyline Boulevard: UGB to Cornelius Pass Road	Speed zone study – Conduct speed study to determine appropriate speed limit for Skyline Boulevard from Cornelius Pass Road east to city limits of Portland.	high	$
S20	West Hills Transportation Demand Management Study	Conduct a study to determine the best TDM practices to implement in the West Hills.	high	$
West County: SIMC				
S2	Gillihan Road/Reeder Road Intersection Improvement Study	Conduct an engineering/safety study to determine impacts and safety considerations for implementing three-way stop-control at the intersection of Gillihan Road and Reeder Road.	medium	$
S3	Sauvie Island Bridge Toll Study	Study the implications of a Sauvie Island Bridge toll for non-residents.	low	$
S4	Sauvie Island Road/Reeder Road Intersection Improvement Study	Conduct an engineering/safety study to determine impacts and safety considerations for implementing three-way stop-control and channelized right-turn for northbound traffic at the intersection of Sauvie Island Road and Reeder Road.	high	$
S5	US 30/Sauvie Island Road Intersection Signal Study	Conduct study of signal timing at the intersection of US 30 and Sauvie Island Road for possible truck extensions, westbound detection issues, and optimization of green and red time.	high	$
S6	Advisory Bike Lane Study	Conduct engineering study to identify potential locations for an advisory bike lane pilot test and verify adequate sight distance.	low	$
S7	Daily Trip Study	Study to explore a daily trip cap.	low	$
S8	Parking Information Distribution Study	Study to determine the most effective and feasible method to implement distribution of parking information.	low	$
S9	Permitting Study	Work with ODF&W to implement an increased parking permit fee and/or limit number of permits. Include bicycle permitting.	low	$
S10	Sauvie Island Park-n-Ride and Shuttle Service Study	Study to determine location of off-island park-n-ride lots and plan for on-island shuttle service for events.	low	$
S11	SIMC Rail Study	Conduct rail corridor study to identify feasible local street connections and railroad crossing consolidation and upgrades. Project will include coordinate with owners of the private rail crossings.	low	$
S12	Ticket and Permit Enforcement Study	Study the implementation of increased permits and enforcement of permits; including illegally parked vehicles, beach day use permits, and existing permit compliance.	high	$
East County				
S13	Corbett Hill Road Safety Study	Study Corbett Hill Road between I-84 and Historic Columbia River Highway for potential safety improvements including curve warning signs, delineation, and shoulder widening.	low	$
S14	Hurlburt Road Safety Study	Study the need for further safety measures after the implementation of Project E14.	low	$
S15	Lusted Road Safety Study	Study Lusted Road for 1/4 of a mile in the east direction starting 1/3 of a mile east of Cottrell Road for potential safety improvements including curve warning signs, delineation, and shoulder widening.	medium	$

S16	Orient Drive/282nd Avenue Safety Study	Study Orient Drive/282nd Avenue for potential safety improvements including advanced warning signs and signal modifications (timing, phasing, controller).	medium	$
S17	Stark Street Safety Study	Study Stark Street between 36th Street and Historic Columbia River Highway for potential safety improvements including advanced warning signs and signal modifications (timing, phasing, controller).	high	$
S18	East County Transportation Demand Management Study	Conduct a study to determine the best TDM practices to implement in East County.	low	$
County-wide				
S19	Shared Bikeways Signage Study	Study all shared bikeways designated on the Bicycle Map for potential signage needed.	low	$

KEY CODE AMENDMENTS

The Transportation Planning Rule (TPR), as codified in Oregon Administrative Rules (OAR) 660-012-0020(2)(h), requires that local jurisdictions identify land use regulations and code amendments needed to implement the TSP, and include them as the implementation element.

Multnomah County's TSP will be implemented through a variety of activities, including:

Planning, designing and constructing proposed projects. The County plans for and builds capital projects through its Transportation Capital Improvement Plan and Program (CIPP). The CIPP is updated every five years and is reviewed biennially for programming corrections. The Capital Improvement Plan identifies and ranks transportation improvement needs on county roadways and bridges over the next 20 years, drawing in large part from projects identified in the TSP. County staff uses objective criteria to evaluate and score potential projects. Criteria include safety, health, equity, access to transit, congestion relief, support of regional land use goals, and community support. The Capital Improvement Program assigns anticipated revenues to the highest priority projects for a five-year period. The program is reviewed by the County Transportation Division annually for programming updates. Detailed design and public outreach is conducted for projects that are funded through the CIPP process, prior to construction.

Updating applicable development code standards. As part of the TSP process, the project team evaluated the County's Zoning Ordinance for consistency with Oregon Transportation Planning Rule (TPR) requirements, as well as for its consistency with the TSP generally. Potential updates to the zoning ordinance have been identified and will be adopted subsequent to the adoption of the TSP.

Updating other design standards. Additional road design standards also may need to be updated to implement specific recommendations in the TSP Range of Solutions Toolkit. Some updated design standards may be incorporated in revisions to the County's Transportation Design and Construction Manual in the very near term. Others will require a follow-up effort to prepare and appprove additional revisions to the manual.

Transportation facility review and permitting. The County reviews proposed improvements or projects to provide access to County roads on an ongoing basis, including driveways, drainage facilities, intersection or crossing improvements necessitated by nearby development or other similar projects. Ensuring consistency with the goals, policies and strategies in the TSP will be an essential element of those processes.

FUNDING ANALYSIS

The following provides an overview of Multnomah County's historical and existing transportation funding, a projection of future funding based on historical information, and an overview of additional potential funding sources.

Historical and Existing Funding

This section summarizes the historical transportation funding sources for Multnomah County. The information summarized below will be used to assist in identifying potential funding gaps associated with future county projects and programs.

Historically, transportation funds have been collected through local sources, private contributions, state government, federal government, and non-jurisdiction work. Local sources include, but are not limited to, fuel taxes and local governments such as cities. Motor vehicle registration fees were introduced and collected starting in the year 2011 and are a part of the funds from local sources. Federal stimulus funds (ARRA) dedicated to transportation projects represent a new federal funding source for 2010. The transportation program includes streets, sidewalks, bike paths, railroad crossings, and transit.

Exhibit 2 reports the total transportation funding for Multnomah County for the year 2005 through 2014. Table 11 details the County's transportation funding by source. As shown, 2013 and 2014 received the most funding over the last decade with over double the funding of prior years. In 2013, funding from local sources spiked due to sales of bonds totaling $128,000,000. Funds from fuel tax have remained fairly consistent over the last decade contributing between $6,500,000 and $7,400,000 each year. Like fuel tax, state funds have remained within a relatively narrow range, between $29,000,000 and $39,000,000, with the exception of 2005 which saw a contribution of about $55,600,000. State funding is the biggest funding source throughout the past ten years, excluding the 2013 sale of bonds as previously mentioned.

Other funding options are being explored such as user fees, congestion pricing, and mileage-based registration fees. For example, the State of Oregon set up the Road Usage Charge Program in 2015, with a pilot study in 2012, that charges volunteer users based on vehicle-miles-traveled. There is a set charge rate per mile, and credits are given for state tax paid on fuel purchased.

Exhibit 2 Multnomah County Funding for Transportation (2005-2014)

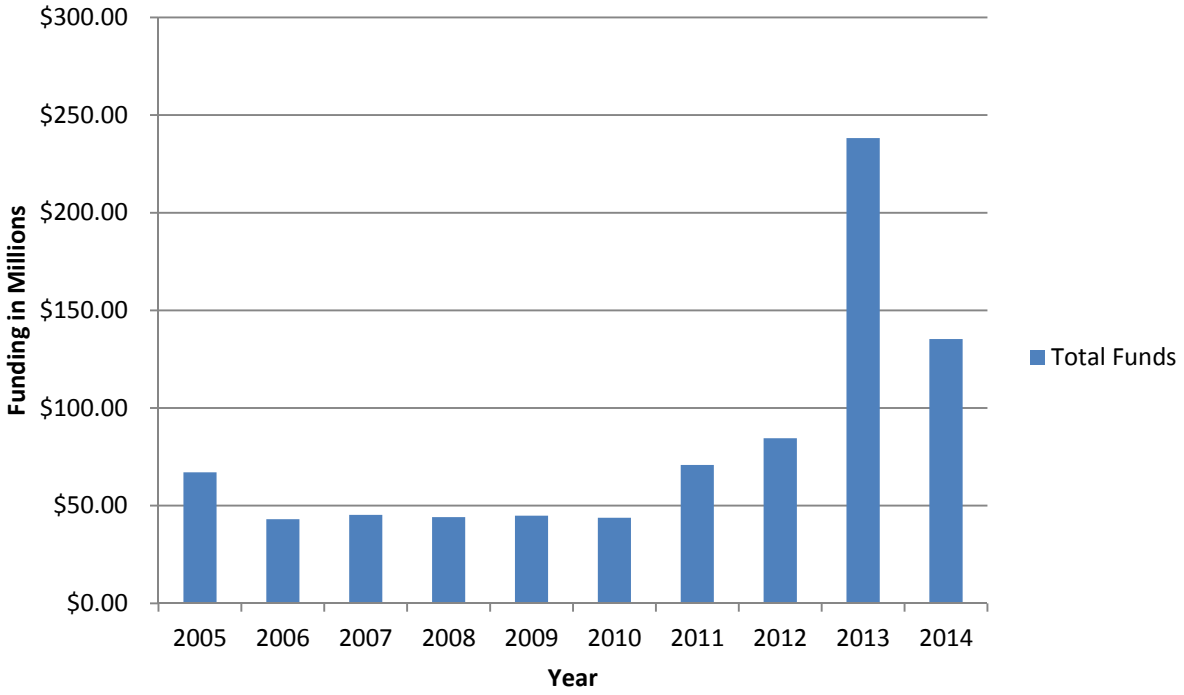


Table 11 Multnomah County Funding for Transportation Years 2005-2014

Year	Source						Total
	Fuel Tax	Local Sources	Private Contributions	State Funding	Federal Funding	Non-Jurisdictional Work	
2005	$6,744,233	$2,037,616	$0	$55,586,395	$1,869,318	$837,315	$67,074,877
2006	$7,114,721	$2,337,147	$213,243	$31,040,765	$1,417,995	$943,352	$43,067,223
2007	$7,110,272	$1,567,375	$130,880	$32,385,736	$1,105,605	$2,963,682	$45,263,550
2008	$7,356,083	$1,339,539	$0	$29,298,036	$3,418,294	$2,681,591	$44,093,543
2009	$6,878,197	$2,569,042	$0	$30,370,214	$2,884,584	$2,179,068	$44,881,105
2010	$6,982,150	$1,311,827	$0	$29,004,662	$4,363,057	$2,121,595	$43,783,291
2011	$7,052,045	$17,519,052	$0	$33,561,224	$9,883,713	$2,856,357	$70,872,391
2012	$6,811,257	$26,294,096	$0	$36,227,457	$12,990,232	$2,222,274	$84,545,316
2013	$6,573,115	$188,254,386	$0	$38,972,767	$2,399,555	$1,992,451	$238,192,274
2014	$6,627,984	$61,920,847	$0	$38,527,230	$26,201,381	$2,059,726	$135,337,168

Exhibit 3 reports the total expenditures of Multnomah County for transportation in the years 2005 through 2014. Table 12 summarizes the County's transportation expenditures by source. Years 2013 and 2014 had the most spending with over double what the majority of the other years spent. Those

years also saw additional local funding from bonds as discussed above. Spending on Capital Projects and Payments to other Governments/Jurisdictions were the two largest expenditures over the past decade. Payments to other governments and jurisdictions included payments to counties, cities, other local agencies, and state and state highway projects.

Spending on capital projects increased significantly starting in 2012. The majority of the spike in spending went to system preservation for the Sellwood Bridge Project. The year 2012 increase was almost evenly split between project engineering and system preservation, each with approximately $21 million, but 2013 and 2014 spent about $56 million and $73 million, respectively, on system preservation alone.

Exhibit 3 Multnomah County Expenditures for Transportation (2005-2014)

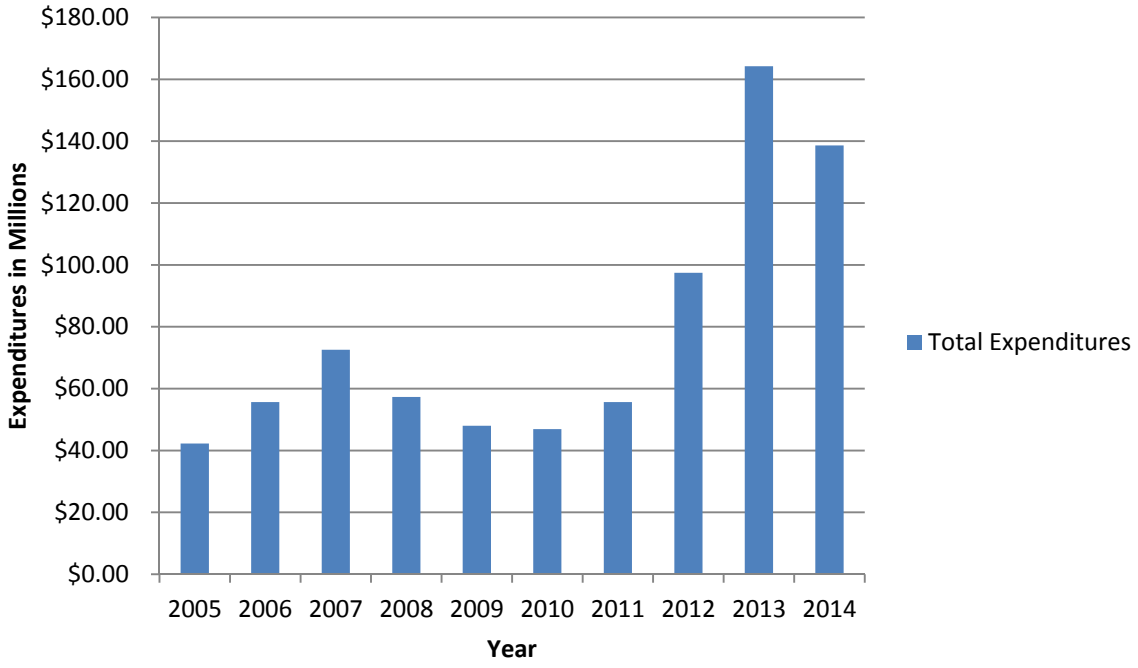


Table 12 Multnomah County Expenditures for Transportation Years 2005-2014

Year	Source							Total
	Capital Projects (Improvements and Preservation)	Operations & Maintenance	Administration & General Engineering	Match Payments for Local Agency Projects	Debt Service on Local Obligations	Payments to Other Governments/Jurisdictions	Reimburse-ments[1]	
2005	$8,822,124	$7,403,780	$3,423,016	$0	$288,022	$21,349,429	$942,708	$42,229,079
2006	$7,788,562	$7,164,162	$3,943,756	$0	$291,289	$35,333,705	$1,440,134	$55,661,608
2007	$21,856,624	$5,821,601	$4,080,165	$14,534,934	$287,996	$23,493,283	$2,513,914	$72,588,517
2008	$18,669,634	$5,942,808	$3,931,355	$3,065,694	$287,996	$22,903,091	$2,508,531	$57,309,109
2009	$11,156,600	$7,797,336	$4,318,754	$1,356,283	$288,000	$20,885,234	$2,179,068	$47,981,275
2010	$8,481,991	$9,107,884	$3,126,007	$1,458,258	$288,000	$20,008,305	$2,432,796	$46,903,241
2011	$15,646,108	$8,445,260	$2,828,115	$1,487,761	$288,000	$24,673,775	$2,263,774	$55,632,793
2012	$54,067,309	$9,061,593	$3,215,765	$780,522	$701,151	$27,415,906	$2,222,275	$97,464,521
2013	$69,568,440	$8,075,180	$4,563,300	$0	$52,495,665	$27,523,385	$1,990,000	$164,215,970
2014	$85,669,337	$7,554,458	$4,582,540	$0	$9,929,719	$28,793,395	$2,109,428	$138,638,877

[1]Expenditures that are reimbursed for work done on others' roads/streets

Projected Funding and Funding Needs

Prior to the bond funds in 2012, average annual spending on capital projects from 2005 through 2011 was approximately $13 million per year including both engineering and preservation projects. This equates to approximately $260 million over the next 20 years.

Potential Funding Sources List

The County has three basic categories of funding to draw from to fund transportation projects in the unincorporated areas. A brief description of each category is below.

- Federal Sources
    - Congestion Mitigation and Air Quality (CMAQ)
    - Highway Safety Improvement Program (HSIP)
    - Fixing America's Surface Transportation Act (FAST Act)
- State Sources
    - Road Fund (also referred to as the Oregon State Highway Trust Fund)
    - Surface Transportation Program
    - All Roads Transportation Safety (ARTS)
    - ConnectOregon

- Statewide Transportation Improvement Program (STIP -Fix-It)
- Statewide Transportation Improvement Program (STIP - Enhance)
- Transportation and Growth Management Grants (TGM)

- Local Sources
  - Economic Improvement Districts (EID)
  - Bond Measure
  - Fuel Tax/Registration Fee
  - Local Improvement Districts (LID)
  - Road District

Federal Sources

Congestion Mitigation and Air Quality (CMAQ)

The Congestion Mitigation and Air Quality (CMAQ) program provides funding for projects that help reduce emissions and meet national air quality standards, such as transportation demand management programs, bicycle and pedestrian improvements, transit projects, diesel retrofits, and vehicle emissions reductions programs.

More Information: http://www.fhwa.dot.gov/environment/air_quality/cmaq/.

Highway Safety Improvement Program (HSIP)

The Highway Safety Improvement Program (HSIP) provides funding for infrastructure and non-infrastructure projects that improve safety on all public roads, including non-State-owned public roads and roads on tribal lands. The HSIP requires a data-driven, strategic approach to improving highway safety on all public roads that focuses on performance. ODOT administers HSIP funding through the All Roads Transportation Safety (ARTS) program described below.

More information: http://safety.fhwa.dot.gov/hsip/.

Fixing America's Surface Transportation Act (FAST Act)

The Fixing America's Surface Transportation Act (FAST Act)provides funding for programs and projects defined as transportation alternatives, including on- and off-road pedestrian and bicycle facilities, infrastructure projects for improving non-driver access to public transportation and enhanced mobility, community improvement activities, and environmental mitigation; recreational trail program projects; safe routes to school projects; and projects for planning, designing, or constructing boulevards and

other roadways largely in the right-of-way of former Interstate System routes or other divided highways.

More Information: http://www.fhwa.dot.gov/map21/guidance/guidetap.cfm.

State Sources

Surface Transportation Program (STP)

The Surface Transportation Program (STP) provides flexible funding that may be used by states and localities, such as Multnomah County, for projects to preserve and improve the conditions and performance on any Federal-aid highway, bridge and tunnel projects on any public road, pedestrian and bicycle infrastructure, and transit capital projects, including intercity bus terminals.

Road Fund (Oregon State Highway Trust Fund)

The expenditures of the Road Fund are restricted for construction, reconstruction, improvement, repair, maintenance, operation, use and policing of public highways, roads and streets within the County. The funding stream is considered stable but is anticipated to decrease as vehicle fuel efficiency increases. The cost of maintaining roadways and building new ones is also increasing, which means the purchasing power of these funds will not provide the same level of maintenance or as many capital projects as in the past. There is potential in the future for a mileage-based fee to replace the gas tax.

All Roads Transportation Safety (ARTS)

The All Roads Transportation Safety (ARTS) program (formerly known as Jurisdictionally Blind Safety Program) is intended to address safety needs on all public roads in Oregon. By working collaboratively with local road jurisdictions (cities, counties, MPO's and tribes) ODOT expects to increase awareness of safety on all roads, promote best practices for infrastructure safety, compliment behavioral safety efforts and focus limited resources to reduce fatal and serious injury crashes in the state of Oregon. The program is data driven to achieve the greatest benefits in crash reduction and should be blind to jurisdiction. The ARTS program primarily uses federal funds from the HSIP.

More Information: http://www.oregon.gov/ODOT/HWY/TRAFFIC-ROADWAY/Pages/ARTS.aspx.

ConnectOregon

ConnectOregon is a lottery bond based initiative to invest in air, rail, marine, transit, and bicycle/pedestrian infrastructure to ensure Oregon's transportation system is strong, diverse, and efficient. ConnectOregon projects are eligible for up to 80% of project costs for grants and 100% for loans. A minimum 20% cash match is required from the recipient for all grant funded projects. Projects

eligible for funding from state fuel tax revenues (section 3a, Article IX of the Oregon Constitution, the Highway Trust Fund), are not eligible for ConnectOregon funding. If a highway or public road element is essential to the complete functioning of the proposed project, applicants are encouraged to work with their ODOT region, city, or county to identify the necessary funding sources.

More Information: http://www.oregon.gov/ODOT/TD/TP/pages/connector.aspx.

Statewide Transportation Improvement Program (STIP)

The Statewide Transportation Improvement Program (STIP) is ODOT's four-year transportation capital improvement program. It is the document that identifies the funding for, and scheduling of, transportation projects and programs. It includes projects on the federal, state, city, and county transportation systems, multimodal projects (highway, passenger rail, freight, public transit, bicycle and pedestrian), and projects in the National Parks, National Forests, and Indian tribal lands. STIP project lists are developed through the coordinated efforts of ODOT, federal and local governments, Area Commissions on Transportation, tribal governments, and the public.

The STIP is divided into two broad categories: Fix-It and Enhance. The Enhance category funds activities that enhance, expand, or improve the transportation system. The project selection process for the Enhance category has undergone significant changes in the last few years and reflects ODOT's goal to become a more multimodal agency and make investment decisions based on the system as a whole, not for each mode or project type separately. ODOT has requested assistance from its local partners in developing Enhance projects that assist in moving people and goods through the transportation system. The projects are selected through a competitive application process. The Fix-it category funds activities that fix or preserve the transportation system. These projects are developed mainly from ODOT management systems that help identify needs based on technical information for things like pavement and bridges.

More information: http://www.oregon.gov/ODOT/TD/STIP/Pages/default.aspx.

Transportation and Growth Management Grants (TGM)

The Transportation Growth Management (TGM) program supports community efforts to expand transportation choices for people. By linking land use and transportation planning, TGM works in partnership with local governments to create vibrant, livable places in which people can walk, bike, take transit or drive where they want to go. TGM is partnership between the Oregon Department of Transportation and the Oregon Department of Land Conservation and Development. The program receives support from the State of Oregon and the Federal Highway Administration of the U.S. Department of Transportation. TGM grants are awarded on an annual basis in two categories: transportation system planning and integrated land use & transportation planning.

More Information: http://www.oregon.gov/LCD/TGM/pages/index.aspx.

Local Sources

The following section describes local funding options available to implement the projects contained within the TSP Update. Each description includes the potential funding level, the action needed to implement the option, the administrative cost of implementation, anticipated community acceptance of the action, and the types of projects that could be implemented through the option. All options discussed are allowable and commonly used in other Oregon communities. Some require specific action in order to establish the program for the first time.

Economic Improvement Districts (EIDs)

Transportation improvements can often be included as part of larger efforts aimed at business improvement and retail district beautification. Economic Improvement Districts collect assessments or fees on businesses in order to fund improvements that benefit businesses and improve customer access within the district. Adoption of a mutually agreed upon ordinance establishing guidelines and setting necessary assessments or fees to be collected from property owners is essential to ensuring a successful EID.

Local Bond Measures

Local bond measures, or levies, are usually initiated by voter-approved general obligation bonds for specific projects. Bond measures are typically limited by time, based on the debt load of the local government or the project under focus. Funding from bond measures can be used for right-of-way acquisition, engineering, design, and construction of transportation facilities. Transportation-specific bond measures have passed in other communities throughout Oregon. Though this funding source is one that can be used to finance a multitude of project types, although the accompanying administrative costs are high and voter approval must be gained.

Local Fuel Tax, Fuel Efficiency Charge and/or Registration Fee

Every state collects an excise tax on fuel, and this includes diesel and biodiesel. Only nine states permit cities or counties to impose a local fuel tax, and Oregon is one of those states. Many Oregon counties and cities, have chosen to implement this mechanism in order to pay for street operation, maintenance and preservation activities.

Local Improvement Districts (LIDs)

Local Improvement Districts (LIDs) are most often used by Countys to construct localized projects such as streets, sidewalks, or bikeways. Through the LID process, the costs of local improvements are generally spread out among a group of property owners within a specified area. The cost can be allocated based on property frontage or other methods such as trip generation. Though the costs of an

LID project are borne primarily by the property owners, moderate administrative costs must be factored in, and the public involvement process must still be followed.

Road District

Road districting is a technique used to localize road construction or maintenance to a portion of a county and to place financial responsibility within the localized area. Typically this tool is used to facilitate the improvement of local access or unimproved roads and is not used on roads already maintained by the county. Attachment "C" includes additional information on Road Districts.

Additional information: http://www.oregonlaws.org/ors/chapter/371

Urban Growth Management Agreement

An Urban Growth Management Agreement (UGMA) is an intergovernmental agreement that outlines how facilities are managed in the area outside the City limits, but inside the City's Urban Growth Boundary (UGB).

Urban Renewal District/Tax Increment Financing

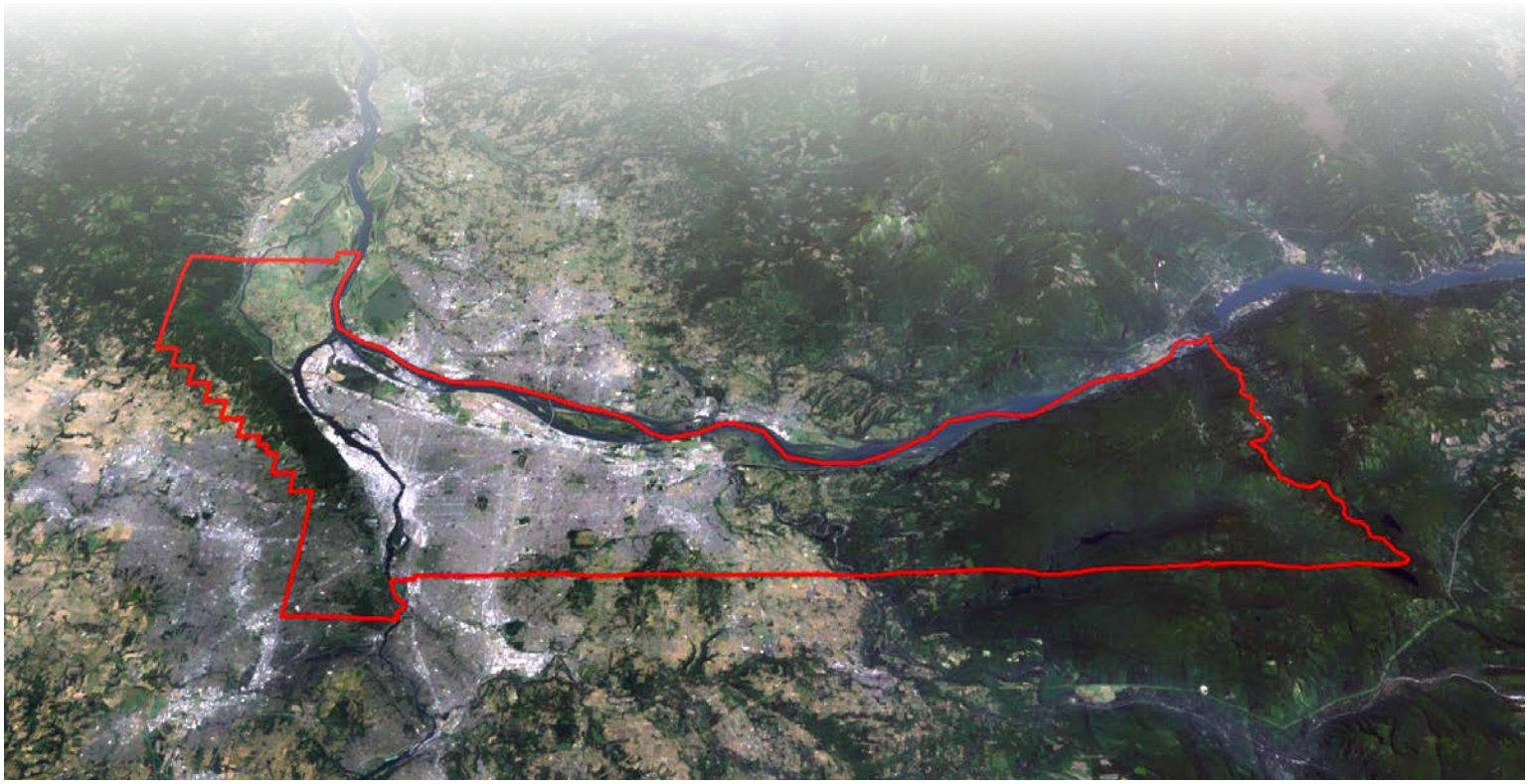
Urban Renewal Districts are separate taxing districts created to remove blight within a District as defined by State statute and local Urban Renewal Plans. Each Urban Renewal Plan has identified actions that will remove the blight within the District. Those actions are funded by debt financing (e.g., bonds) using the incremental tax revenue generated from improvements on private property that increase the tax assessable value of that property that then create additional property tax revenue. The additional tax revenue (i.e., tax increment) is then directed to the Urban Renewal District to be used for blight removal. This public finance method is referred to as Tax Increment Financing (TIF) and is limited to Urban Renewal in the State.

Appendix A Baseline Report Memo

Multnomah County

Comprehensive Plan

Baseline Report



Demographics, Land Use, Transportation, and Policy

APG

December 2014

Prepared by Angelo Planning Group, JLA Public Involvement, Kittelson & Associates, SWCA Environmental Consultants, GeoEnginners, Oregon Public Health Institute.

CONTENTS

INTRODUCTION & STUDY AREA

This report describes three types of information relevant to the update of the Multnomah County Comprehensive Plan and Transportation System Plan:

1. Existing conditions with regard to population, development in the rural areas of Multnomah County
2. Information about state, regional and local plans, statutes and administrative rules and other policies relevant to the Comprehensive Plan update
3. Transportation plans and policy issues relevant to the Comprehensive Plan and TSP update [1]

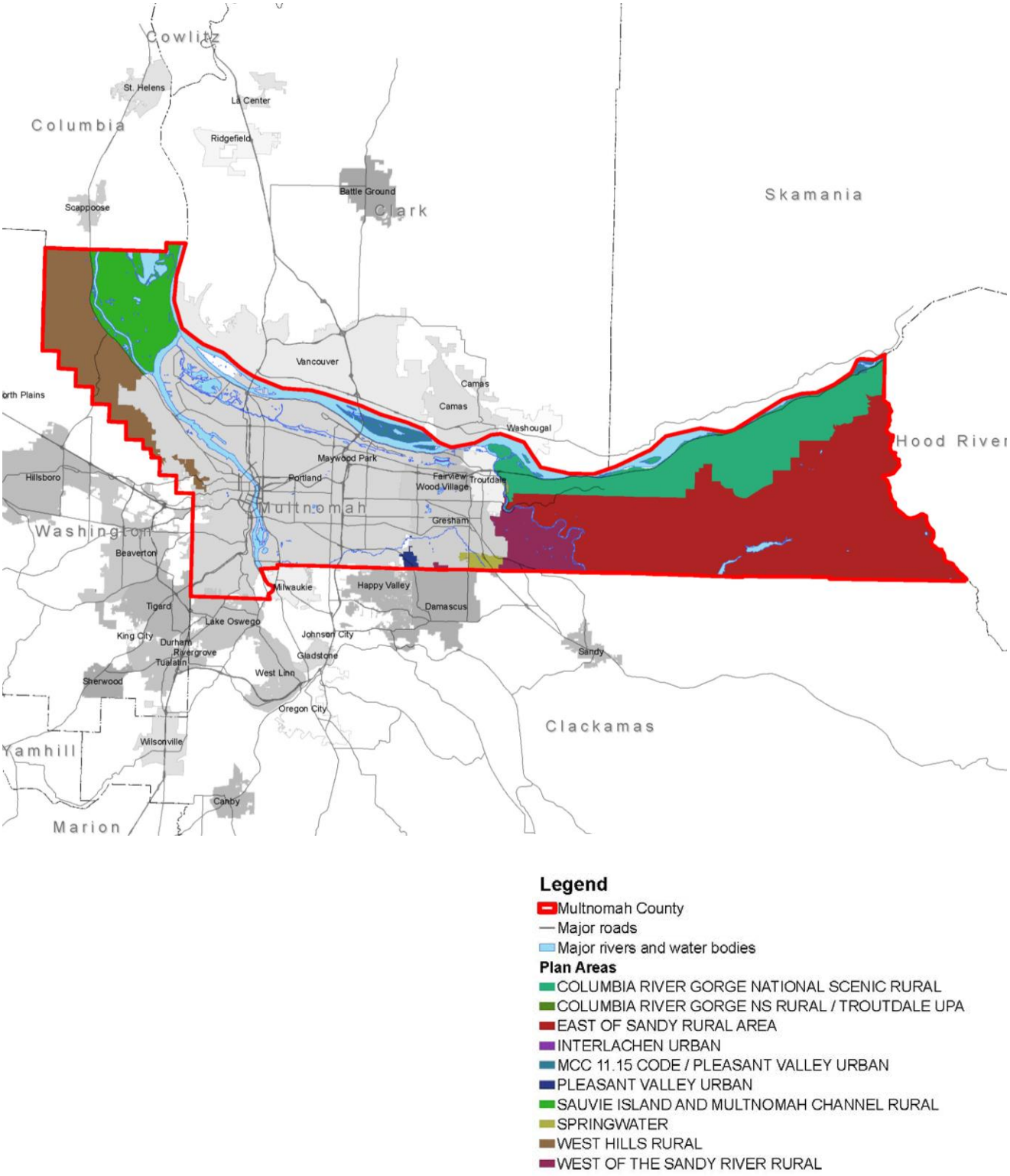
Rural Multnomah County is broken down into the following subareas, shown on Figure 1:

1. East of Sandy River
2. West of Sandy River
3. Pleasant Valley
4. Interlachen
5. West Hills
6. Sauvie Island
7. Columbia River Gorge National Scenic Area

Government Island is also within the unincorporated portion of the County. That area is used primarily for agricultural purposes with some recreational access to the shore/beach areas. However, the island does not have any full-time inhabitants, public facilities or road access. Therefore, it is not described in detail in the remainder of this report.

[1] These issues are described in more detail in the following technical memoranda: TM 3.1: Population Demographics, Zoning, and Development; TM 3.2: Transportation Facilities and Plans; and TM 3.3: State and Regional Requirements & Gap Analysis

Figure 1. Context Map



POPULATION DEMOGRAPHICS, ZONING, AND DEVELOPMENT

This section summarizes and builds upon the Multnomah County Demographic Profile completed as part of Task 2. Zoning and land use data was obtained from Multnomah County and Metro's Regional Land Information System (RLIS).

POPULATION & DEMOGRAPHICS

ANALYSIS AREAS

Much of this analysis is based on US Census data, the boundaries of which do not align perfectly with the rural planning area boundaries. For example, the Census tract for Sauvie Island covers that rural area as well as a portion of West Hills (as defined in the Comprehensive Framework Plan and West Hills Rural Area Plan). The census tracts and block groups used in this analysis to describe the rural subareas of Multnomah County are shown in Figure 2 through Figure 4 and listed in Table 1. Additionally, some data is unavailable at the block group level, and block group boundaries have changed between the 2000 and 2010 censuses. In some cases, this memorandum simply describes the rural areas as West Multnomah County and East Multnomah County, as appropriate to address the shifts in boundaries over time and avoid inaccuracies in representing data trends over time.

Figure 2. Study Area Census Tracts (70, 71, 104.02, and 105)

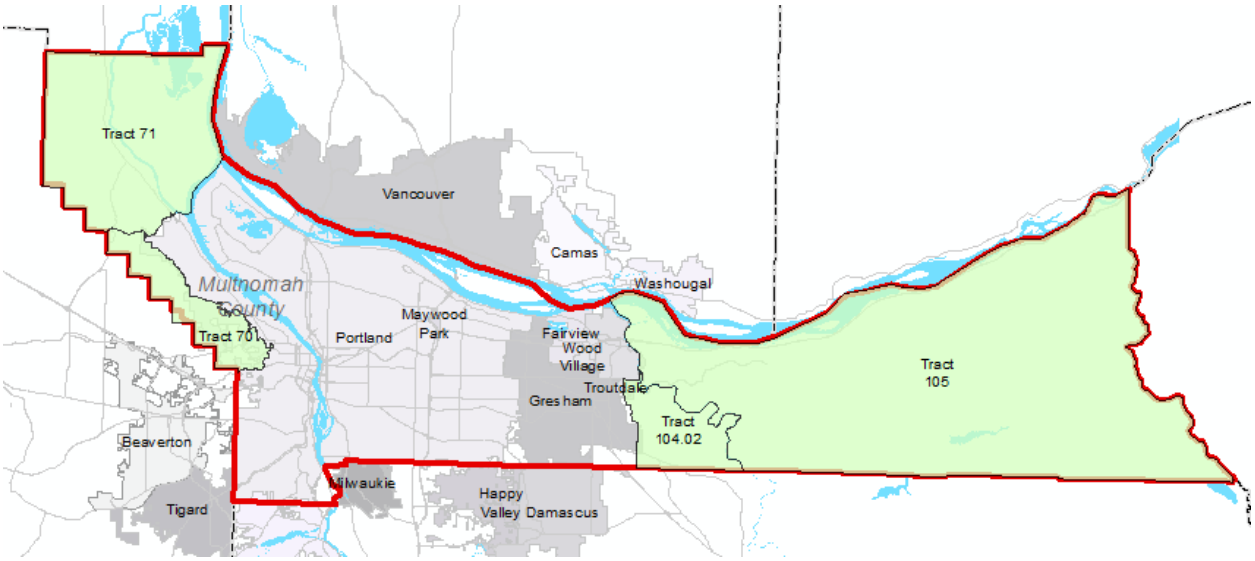


Figure 3. Study Area Block Groups (East Multnomah County)

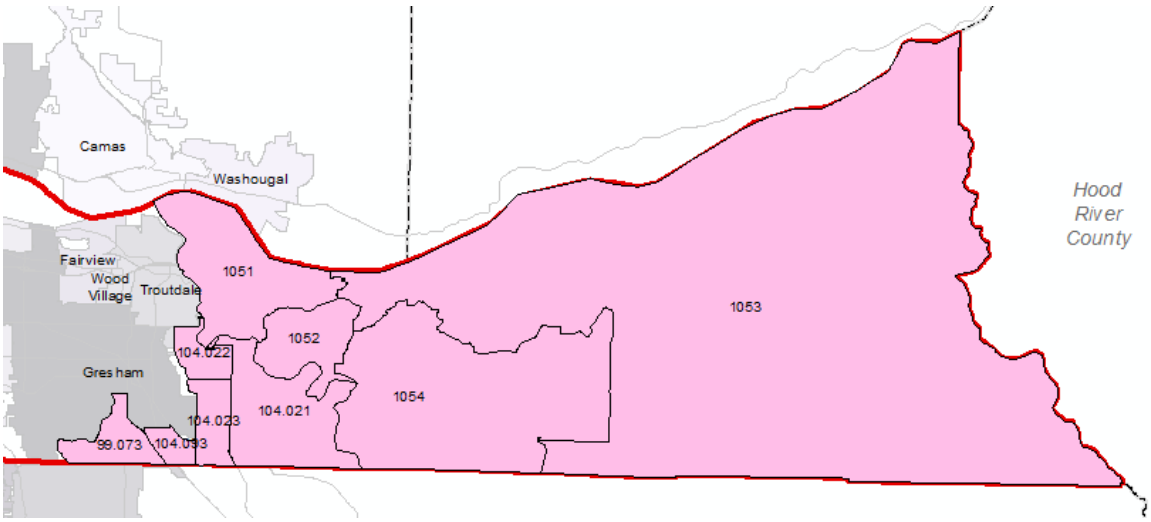


Figure 4. Study Area Block Groups (West Multnomah County)

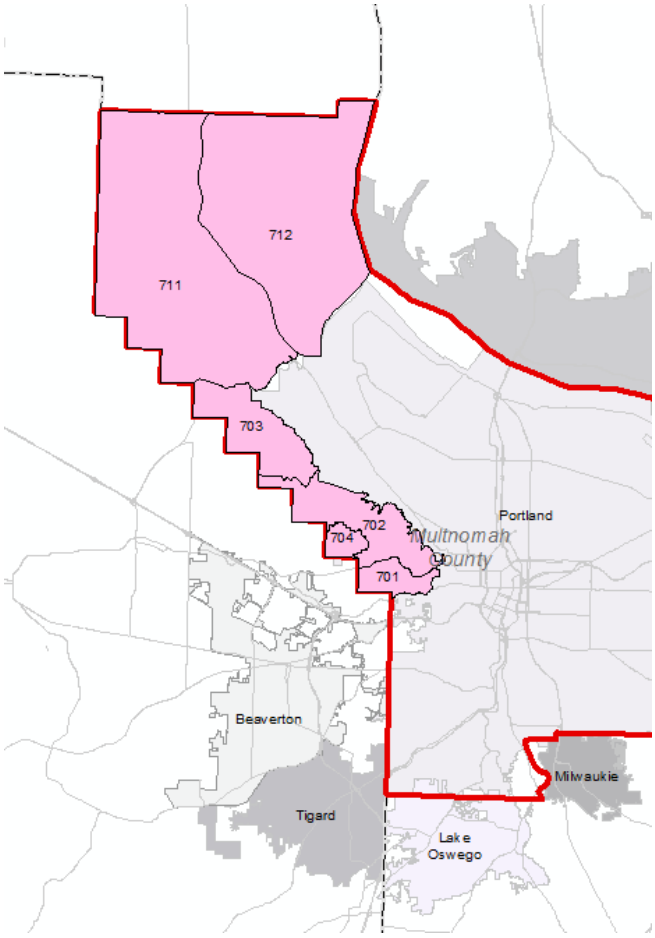


Table 1. Multnomah County Rural Subareas and Census Geographies

Plan Area	Census Geographies	
	2000 Census, 2010 Census, 2008-2012 ACS	*2010 Census*
East of Sandy River	Tract 105	Tract 105 BG 12 3 4
West of Sandy River	Tract 104.02	Tract 104.02 BG 1 2 3 ; Tract 104.09 BG 3; Tract 99.07 BG 3
West Hills	Tract 70	Tract 70, BG 1 2 3 4; Tract 71 BG 1
Sauvie Island	Tract 71	Tract 71 BG 2
West Multnomah County	Tracts 70 and 71	
East Multnomah County	Tracts 104.2 and 105	

The remainder of this section describes the characteristics of Multnomah County and its subareas along the following topic lines: Population and Growth, Race/Ethnicity, Family and Households, Health Impacts, and Implications for Planning.

POPULATION & GROWTH

Table 2 below describes the population of Multnomah County and its subareas. In 2010, the population of Multnomah County was at 735,334[2]. This represents a significant increase from the 2000 Census figure of 660,486. Between the years 2000 and 2010, Multnomah County grew by 11.3%, or roughly 1.08% on average per year. This is similar to the State of Oregon, which grew 11.97%, or 1.14% per year, during the same period.

Table 2. Population of Multnomah County

	2010 Census
Multnomah County	735,334
East of Sandy River	3,926
West of Sandy River	10,184
West Hills	10,052
Sauvie Island	888

Source: 2010 Census Block Group Data

In contrast, the rural areas of the county grew at a much higher rate from 2000 to 2010 (see Table 3). West Multnomah County grew at roughly 3.2% a year on average, and East Multnomah County grew at roughly 1.5% per year on average. While this does not represent a significant change in total population compared to growth in the County as a whole, it is a relatively high growth rate for a rural area in Oregon, particularly compared to other rural parts of the state.

[2] Source: U.S. Census Bureau 2010 Census

Table 3. Change in Population - 2000 Census and 2010 Census

	2000	2010	% Change	Population Density***
Multnomah County	660,486	735,334	11.3%	2.47 People/Acre
West Multnomah County*	7,963	10,940	37%	.25 People/Acre
East Multnomah County**	8,668	10,061	16%	.11 People/Acre
State of Oregon	3,421,399	3,831,074	11.9%	--

* Includes Sauvie Island and West Hills subareas

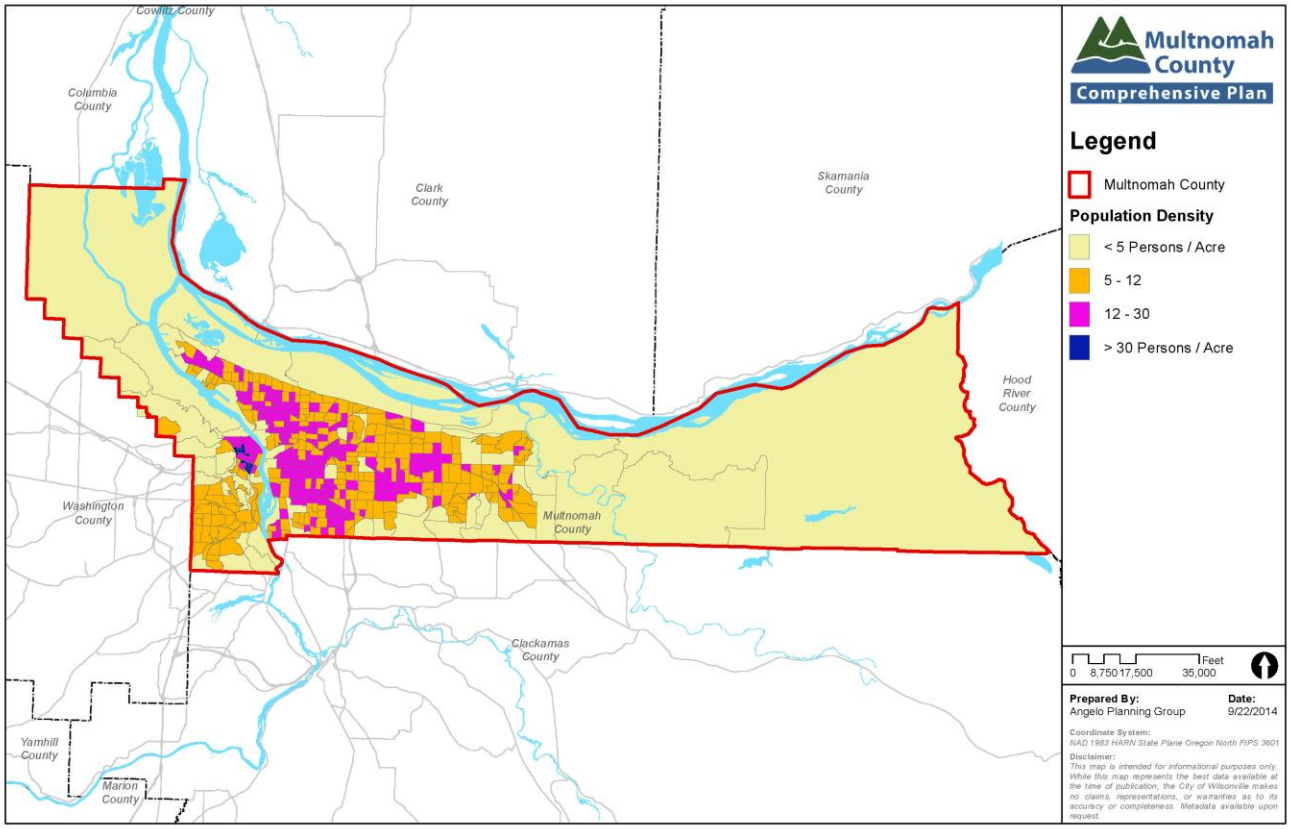
** Includes East of Sandy River and West of Sandy River subareas

*** Calculated as 2010 population / total acres within Census Block Groups listed in Table 1

Source: 2000 and 2010 Census Tract Level Data

Figure 5 shows the population density of the county by block group, as of 2010. Unsurprisingly, most of the county's population is within the City of Portland and its suburbs and population density is much higher in those portions of the County.

Figure 5. Population Density Map



RACIAL/ETHNIC BREAKDOWN

Table 4 below describes the racial and ethnic breakdown of Multnomah County, the county's rural areas, and the State of Oregon. Overall, Multnomah County has a somewhat higher proportion of African American and Asian residents than the state as a whole. The State of Oregon and Multnomah County have roughly same proportion of Hispanic/Latino residents, American Indian and Alaska Native residents, and Native Hawaiian and other Pacific Islander residents. However, the county's rural areas have contrasting demographic profiles when compared to the county as a whole and the State of Oregon. In general, the rural subareas have significantly less racial/ethnic diversity than the rest of the county and the state as a whole.

Table 4. Race and Ethnicity

	East of Sandy River	West of Sandy River	West Hills	Sauvie Island	Multnomah County	State of Oregon
RACE						
African American	0.7%	1.0%	1.0%	0.2%	5.4%	1.8%
American Indian or Native Alaskan	0.6%	0.7%	0.8%	1.8%	0.8%	1.4%
Asian	1.3%	3.1%	11.0%	1.0%	6.5%	3.7%
Native Hawaiian or Pacific Islander	0.0%	0.4%	0.1%	0.1%	0.5%	0.3%
Other Race	1.3%	3.5%	0.8%	5.2%	0.2%	5.3%
Two or More Races	3.4%	3.7%	3.8%	2.5%	5.4%	1.8%
White	92.7%	87.6%	82.5%	89.2%	72.1%	83.6
Ethnicity						
Hispanic/ Latino	3.5%	7.8%	3.3%	0.9%	10.9%	11.7%
Not Hispanic/Latino	96.5%	92.2%	96.7%	90.1%	89.1%	88.3%

Source: 2010 Census Block Group Data

RACE AND ETHNICITY MAPS

The maps on the following pages show the distribution of race and ethnicity in the county.

Figure 1. Race – Percent White by Block Group

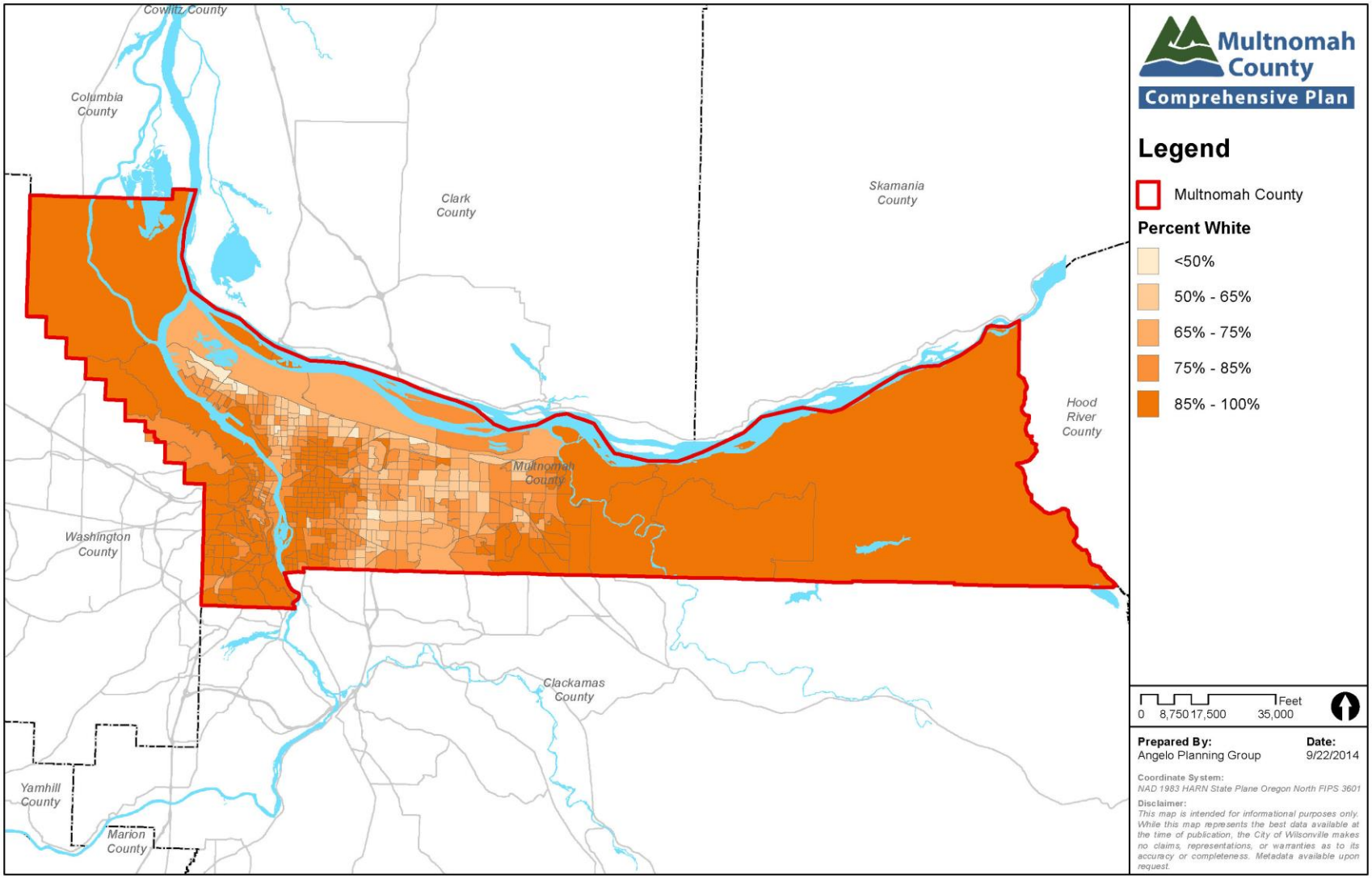


Figure 2. Percent African American by Block Group

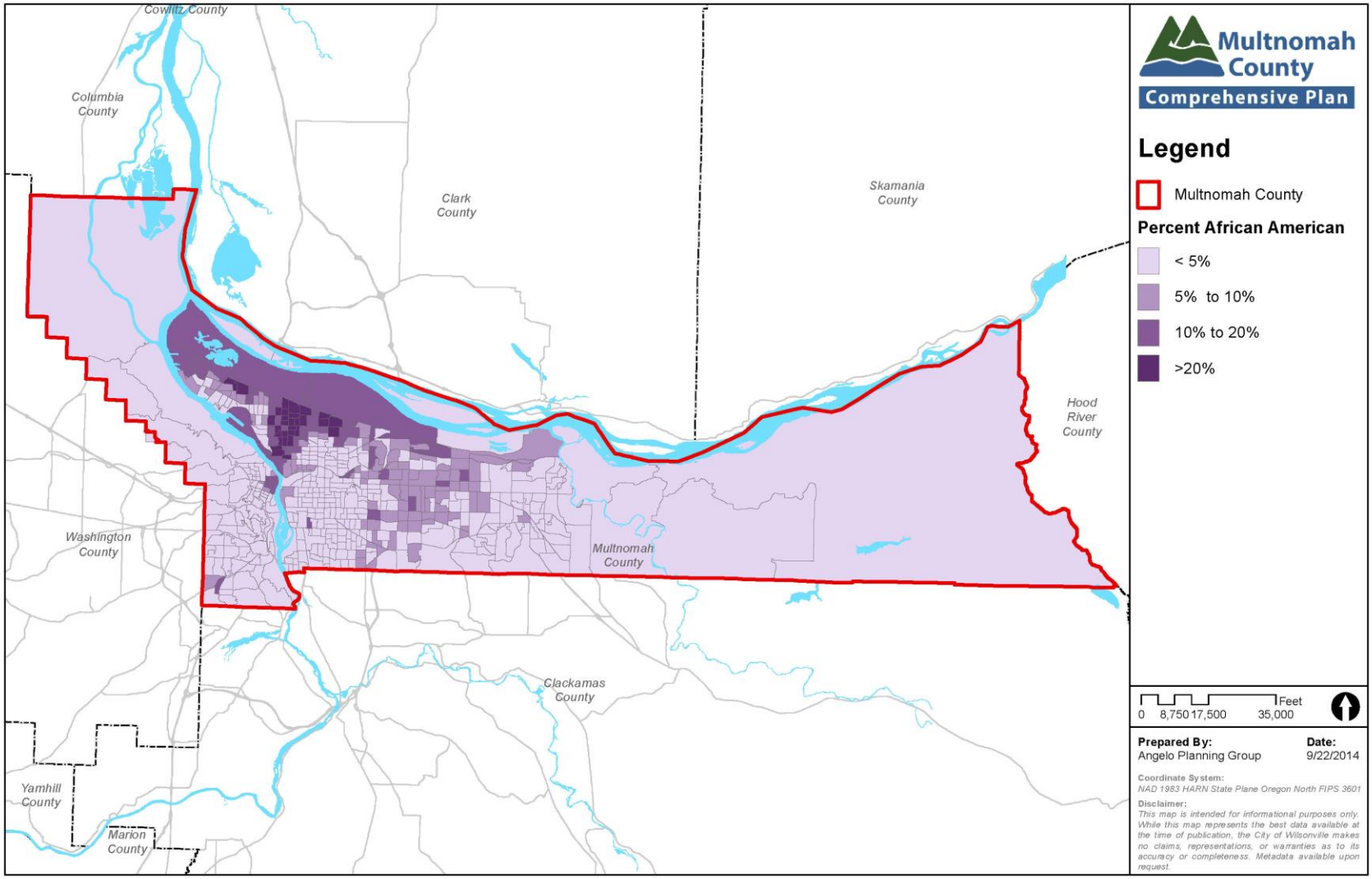


Figure 3. Percent Hispanic by Block Group

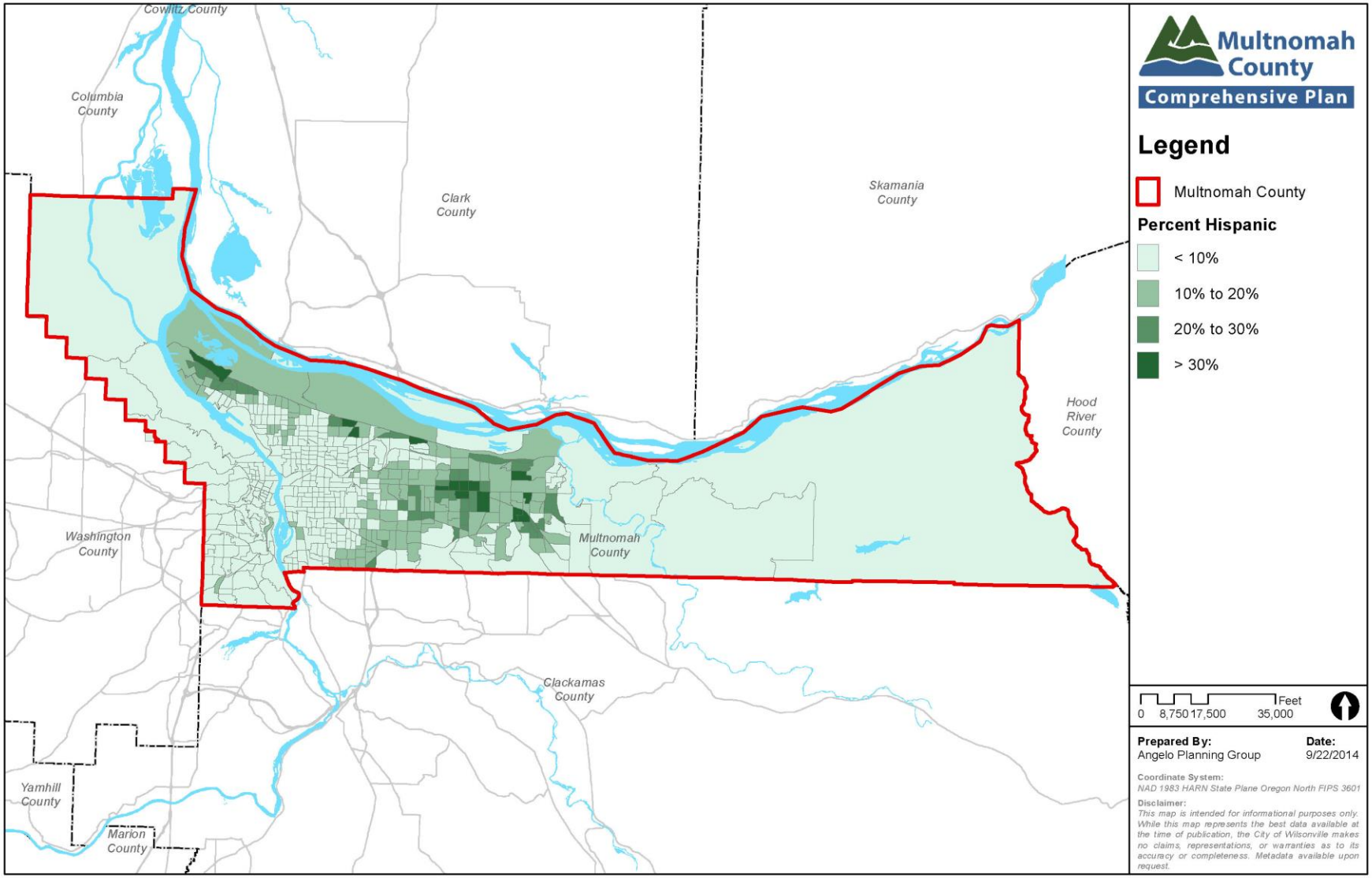
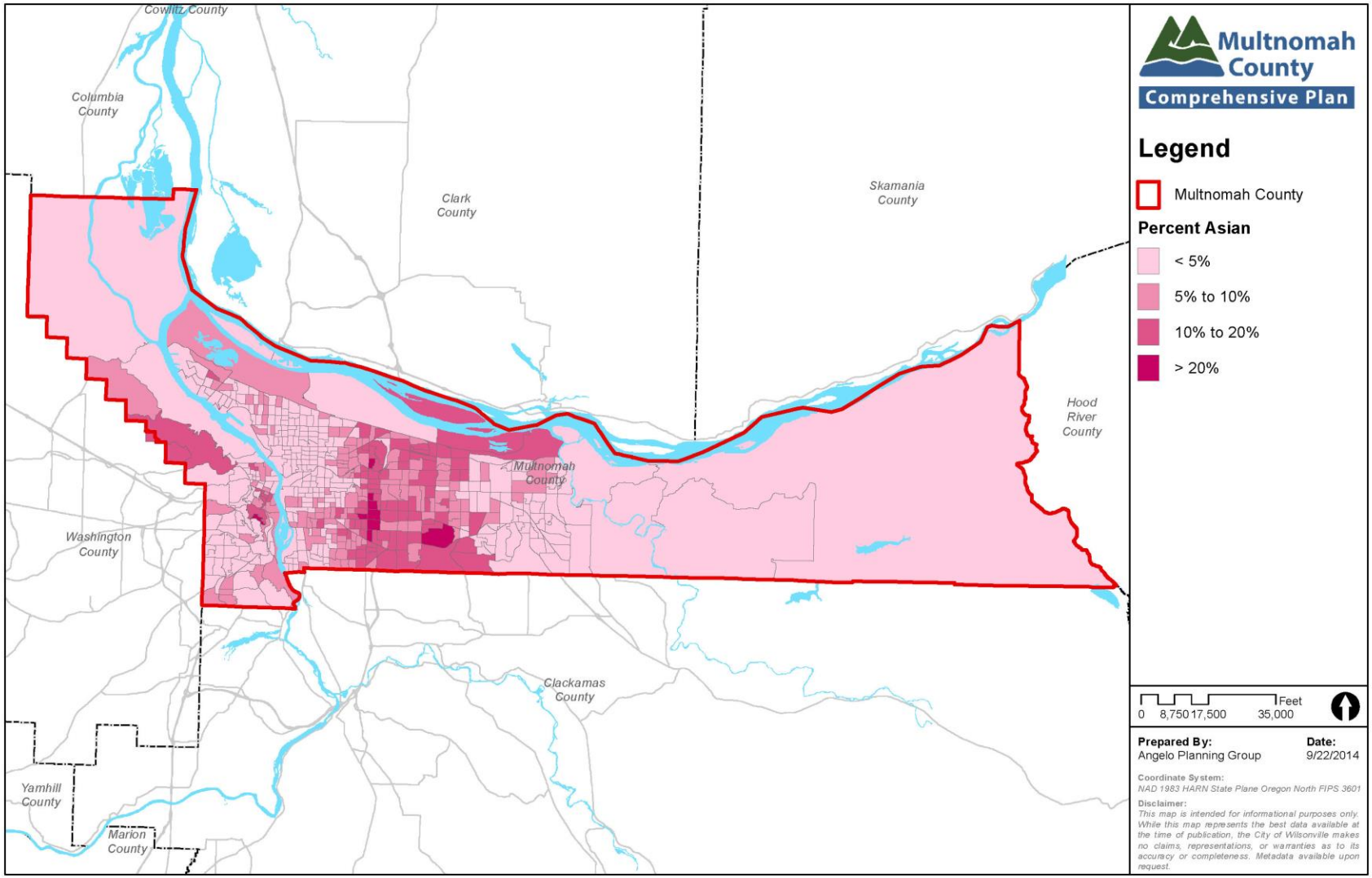


Figure 4. Percent Asian by Block Group



LANGUAGE SPOKEN AT HOME

Language spoken at home is described in Table 5. Overall, the proportion of residents who speak a language other than English at home is somewhat lower than that of the County as a whole. Although margins of error are high, it appears that there is a higher proportion of residents who speak Other Indo-European languages at home in East County, and residents who speak Asian and Pacific Islander Languages at home in West County.

Table 5. Language Spoken At Home

	West Multnomah County		East Multnomah County		Whole County
	Tract 70	**Tract 71**	**Tract 104.2**	**Tract 105**	--
English Only	83.6% +/-4.1	93.0% +/-5.4	92.9% +/-3.2	86.8% +/-6.8	80.4% +/-0.4
Language Other Than English	16.4% +/-4.1	7.0% +/-5.4	7.1% +/-3.2	13.2% +/-6.8	19.6% +/-0.4
Spanish	2.3% +/-1.7	5.5% +/-4.3	3.9% +/-2.5	2.2% +/-1.6	**8.3% +/-0.2**
Other Indo-European Languages	6.0% +/-2.6	1.5% +/-2.1	1.9% +/-2.0	7.8% +/-4.1	4.5% +/-0.3
Asian and Pacific Islander Languages	7.8% +/-2.2	0.0% +/-1.3	0.8% +/-0.7	3.2% +/-3.3	5.6% +/-0.2
Other Languages	0.3% +/-0.5	0.0% +/-1.3	0.6% +/-0.7	0.0% +/-0.9	1.1% +/-0.2

Source: 2008-2012 ACS Data

FAMILY AND HOUSEHOLDS

In Multnomah County, roughly 53% of households are Family Households, defined by the US Census Bureau as “a group of two or more people related by birth, marriage, or adoption and residing together.” As shown in Table 6, the only rural subarea that has a similar family household percentage is Sauvie Island, with 56.8%. All other rural subareas have higher than a 70% Family Household rate. For comparison, 63.4% of Oregonians live in Family Households.

The State of Oregon and Multnomah County have similar Median Ages, 38.4 and 35.7, respectively. However, the median age in rural subareas in the county are significantly higher. Of the County’s rural areas, Sauvie Island has the highest proportion of nonfamily households, the lowest average household size, and the highest median age.

Table 6. Family and Households

	East of Sandy River	West of Sandy River	West Hills	Sauvie Island	Multnomah County	State of Oregon
Number of Households	1,433 (100%)	3,573 (100%)	3,938 (100%)	410 (100%)	304,540 (100%)	1,518,938 (100%)
Family Households	1,063 (74.2%)	2831 (79.2%)	2,832 (71.9%)	233 (56.8%)	163,539 (53.7%)	963,467 (63.4%)
Nonfamily Households	370 (25.8%)	742 (20.8%)	1,106 (28.1%)	177 (43.2%)	141,001 (46.3%)	555,471 (36.6%)
Mean Household Size	2.65	2.85	2.56	2.14	2.35	2.47
Median Age	44.8	40.1	43.9	50	35.7	38.4

Source: 2010 Census Block Group Data

Table 7. Housing Occupancy

Subject	WEST MULTNOMAH COUNTY				EAST MULTNOMAH COUNTY			
	Census Tract 70		Census Tract 71		Census Tract 104.02		Census Tract 105	
	Estimate & Margin of Error	Percent and Margin of Error	Estimate & Margin of Error	Percent and Margin of Error	Estimate & Margin of Error	Percent and Margin of Error	Estimate & Margin of Error	Percent and Margin of Error
Total housing units	3,260 +/-111	100%	1,266 +/-113	100%	2,098 +/-84	100%	1,569 +/-115	100%
Occupied housing units	3,129 +/-118	96.00% +/- 3.0	1,190 +/-121	94.00% +/- 5.2	1,998 +/-94	95.20% +/- 3.6	1,471 +/-119	93.80% +/- 4.7
Vacant housing units	131 +/-100	4.00% +/- 3.0	76 +/-66	6.00% +/-5.2	100 +/-77	4.80% +/- 3.6	98 +/-75	6.20% +/- 4.7

Source: US Census Bureau 2008-2012 ACS Data

Table 8. Housing Tenure & Household Size

Subject	WEST MULTNOMAH COUNTY				EAST MULTNOMAH COUNTY			
	Census Tract 70		Census Tract 71		Census Tract 104.02		Census Tract 105	
	Estimate	Percent	Estimate	Percent	Estimate	Percent	Estimate	Percent
Occupied housing units	3,129 +/-118	100%	1,190 +/-121	100%	1,998 +/-94	100%	1,471 +/-119	100%
Owner-occupied	2,708 +/-162	86.50% +/-3.9	1,003 +/-128	84.30% +/-5.7	1,568 +/-136	78.50% +/-5.9	1,119 +/-138	76.10% +/-7.5
Renter-occupied	421 +/-124	13.50% +/-3.9	187 +/-69	15.70% +/-5.7	430 +/-120	21.50% +/-5.9	352 +/-114	23.90% +/-7.5
Avg. household size of owner-occupied unit	2.7 +/-0.13	(X)	2.24 +/-0.19	(X)	3.2 +/-0.20	(X)	2.94 +/-0.35	(X)
Avg. household size of renter-occupied unit	2.37 +/-0.41	(X)	2.36 +/-0.97	(X)	2.57 +/-0.46	(X)	2.18 +/-0.56	(X)

Source: US Census Bureau 2008-2012 ACS Data

For the 2008-2012 survey window, the study tracts have a high occupancy rate roughly on par with that of the County as a whole (93.7% +/- .4%). Occupied housing units in West Multnomah County are roughly 85% owner-occupied and 15% renter-occupied, and roughly a similar split exists in East Multnomah County.[3] In contrast, Multnomah County as a whole is roughly 55% owner-occupied and 45% renter-occupied.

Owner-occupied units have a greater average household size than renter-occupied units, and East Multnomah County appears to have a higher average owner-occupied household size than West Multnomah County. The county as a whole has an average household size of 2.54 and 2.17 for owner-occupied units and renter-occupied units, respectively.

ECONOMIC CHARACTERISTICS

Figure 5. Census Tract Reference for Economic Characteristics

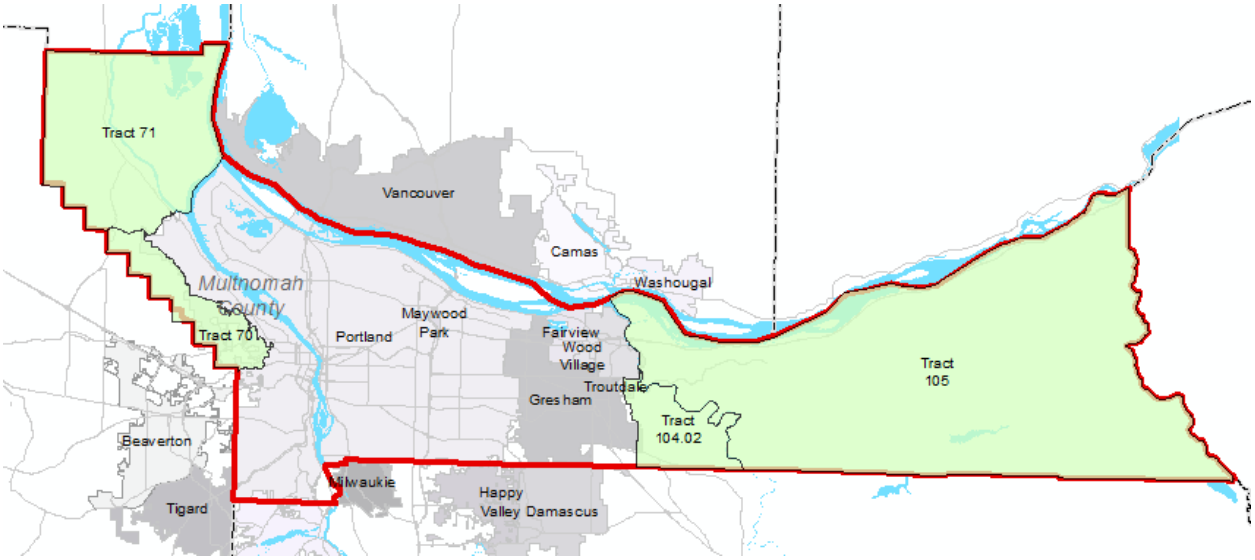


Table 9 describes selected economic characteristics of the study area. The rural areas of the county have a higher median household income than the county as a whole. West County seems to generally have a higher income, lower unemployment rate, and lower poverty rate than East County or Multnomah County as a whole, particularly Tract 70, which approximates the West Hills rural plan area. Due to the small sample size, however, margins of error are fairly high.

[3] Margins of error in the ACS data are between 3.9% and 7.5%, or about the same size as the difference between tracts.

Table 9. Economic Characteristics

	West County		East County		Multnomah County
	Tract 70	**Tract 71**	**Tract 104.2**	**Tract 105**	--
Median Household Income	$148,832 (+/- $19,429)	$78,894 (+/-$14,306)	$76,630 (+/-$9,464)	$65,938 (+/-$10,090)	$51,582 (+/-$739)
Unemployed	7.4% (+/-2.8%)	6.1% +/-4.3%)	14.8% (+/-6.5%)	12.1% (+/-6.1%)	10.4% (+/-0.4%)
Individuals below poverty level in past 12 months	4.5% (+/-3.8%)	3.4% (+/-2.8%)	9.7% (+/-2.8%)	13.4% (+/-%7.3%)	17.1% (+/-0.6%)

Source: US Census Bureau 2008-2012 ACS Data

PUBLIC HEALTH

A detailed review of relevant Multnomah County public health publications, data, and existing conditions for planning-related health determinants and outcomes is included in the Multnomah County Community Demographic Profile dated October 1, 2014. What follows is a selection of that profile.

The update of the County's Comprehensive plans offers both the opportunity to reduce unintended negative health consequences of policy decisions and enhance opportunities to improve public health. A key first step in addressing health in the development of a Comprehensive plan is identifying the baseline health status of the community that the Comprehensive plan applies to. Table 10 lists some of the primary health determinants[4] and health outcomes[5] that researchers have identified as being related to Comprehensive plans.

[4] A "health determinant" is defined as the range of personal, social, economic and environmental factors which determine the health status of individuals or populations. Examples include behavioral determinants such as consumption of fruits and vegetables, physical activity, and smoking, and environmental determinants such as convenient access to healthy food retail, air quality, and traffic infrastructure.

[5] A "health outcome" refers to the health status of an individual, group or population which is attributable to a number of determining factors such as behaviors, social and community environments, health care services, and genetics. Examples include: depression, diabetes, physical injury, asthma, and premature death.

Table 10. Key Planning Related Health Determinants and Health Outcomes

Health Determinants		Health Outcomes
• Opportunities for physical activity • Access to healthy food • Access to health care services • Exposure to air pollution • Exposure to water pollution • Exposure to environmental hazards • Traffic safety	• Access to cultural resources • Exposure to noise • Access to jobs • Access to education • Access to safe, affordable housing • Opportunities for social cohesion • Emergency preparedness	• Heart disease • Cancer • Obesity • Asthma • Physical injury • Stress • Depression • Life expectancy • Communicable diseases • Stroke

Many of the health determinants listed in Table 10 are already routinely considered as part of many Comprehensive planning processes. Other health determinants such as access to jobs, education, and cultural resources are also often considered to a certain extent in many planning processes, while others such as opportunities for physical activity and access to health care and services are relatively new.

EXISTING CONDITIONS FOR KEY PLANNING-RELATED HEALTH DETERMINANTS AND OUTCOMES

The Coalition for a Livable Future (CLF) produced a web-based "Regional Equity Atlas" that provides Census Tract level data for Multnomah County for many planning-related health determinants and outcomes considered by the health department reports[6]. What follows is a summary of this data, beginning with health determinants, followed by health outcomes.

HEALTH DETERMINANTS:

The Equity Atlas provides information on the following planning-related health determinants:

- Access to opportunities for physical activity
- Access to healthy and unhealthy food
- Access to opportunities for social cohesion
- Access to health supportive goods and services

For health determinants, the Equity Atlas provides information on a related set of individual issues, and then produces a composite score for each determinant. As the Tables indicate below, the scores for each individual issue range from 0 to 5, with lower scores indicating relatively poor access and higher scores indicating relatively good access.[7]

[6] The Regional Equity Atlas is available online at https://clfuture.org/equity-atlas

[7] Detailed information about the data and methodology used to construct the Equity Atlas is available on CLFs website: https://clfuture.org/programs/regional-equity-atlas.

The indicators discussed and summarized below are rough indicators and do not generally account for many of the differences between urban and rural communities. For example, the larger lots in rural areas themselves provide more opportunities for physical activity than urban and suburban lots, and larger lots provide more opportunities for vegetable gardening and animal husbandry, thus increasing potential access to healthy foods.

Additionally, rural zoning is primarily intended to preserve and protect resource lands, and therefore does not permit most non-farm and non-forest uses. Consequently, persons residing in these rural areas will not have the same degree of access to health-supportive goods and services as urban residents. Similarly, the low residential density caused by rural zoning typically cannot support locating these uses in outlying rural areas from a market perspective.

OPPORTUNITIES FOR PHYSICAL ACTIVITY:

In general, when people have easy access to opportunities for physical activity, they are more likely to be more physically active. Table 11 provides a summary of the relative accessibility of multiple different opportunities for physical activity, based on proximity to areas or facilities that provide opportunities to engage in physical activity. As the individual and composite scores indicate, the plan areas have uniformly lower access to opportunities for physical activity than the rest of the county, with the exception of proximity to natural areas where the West Hills and East of the Sandy River have relatively better access. Within the plan areas themselves, Sauvie Island has the worst access, and the West Hills has the best.

Table 11. Proximity to Physical Activity Spaces

Plan Area (Tract)	Parks[a]	Natural Areas[b]	Green-spaces[c]	Water Access[d]	Recreation Facilities[e]	Transit[f]	Bikability[g]	Sidewalks[h]	Composite
East of Sandy River (105)	1.11	4.08	0.99	0.98	0.95	0.95	1.94	0.95	23
West of Sandy River (104.02)	1.3	2.1	2.02	1.08	1.05	0.98	2.71	1.07	24
West Hills (70)	2.09	2.9	3.31	1	1.01	1.01	1.98	1.17	32
Sauvie Island (71)	1.01	1.39	1.03	1.05	0.92	0.92	2.27	0.92	14
Multnomah County	4.23	2.82	4.23	1.10	2.19	1.68	4.04	3.08	65

[a] Publicly accessible parks are defined as active or passive recreation areas where facilities exist primarily intended for recreational uses by the public;
[b] Publicly accessible natural areas are managed primarily for the value of natural resources as buffers, conservation and/or habitat protection;
[c] Publicly accessible greenspaces are a general category that is not specifically a park or natural area; greenspaces generally have limited public access and include common areas of a subdivision or condominium complex, cemeteries, golf courses and school grounds that are not specifically designated for general public use
[d] The Water Access indicator shows proximity to points where motorized and non-motorized boats can be launched. These sites have parking areas for cars and include boat ramps.
[e] Recreation facilities were compiled from the Metro RLIS data and include pools, tennis courts, sports fields, community centers, stadiums, and fairgrounds
[f] The Transit Access indicator is a measure of the proximity to public transit stops and the frequency of trips through those transit stops (bus, streetcar, MAX and Vancouver transit).
[g] The Bikeability indicator is a density raster that shows suitability for biking and is based on Metro's "Bike There!" map designations.
[h] The Walkability indicator shows the density of sidewalk coverage as a measure of the walkability of a particular area.

ACCESS TO HEALTHY AND UNHEALTHY FOOD OUTLETS

Table 12 summarizes the relative accessibility of healthy and unhealthy food outlets in different parts of Multnomah County. Scores for unhealthy food access are reversed from the other scores, with higher scores indicating lower access to unhealthy foods. This was done because lower access is considered better for health. As Table 12 indicates, while the plan areas have significantly less access to unhealthy foods, they also have relatively less access to sources of healthy food compared to the County as a whole.

Table 12. Proximity to Healthy and Unhealthy Food Outlets

Plan Area (Tract)	Unhealthy Food[a]	Grocery Stores[b]	Food Pantries[c]	Farmers Markets[d]	Composite
East of Sandy River (105)	4.05	0.98	0.95	0.95	28
West of Sandy River (104.02)	3.94	1.54	1.01	0.98	30
West Hills (70)	3.89	1.48	1.03	1	30
Sauvie Island (71)	4.08	0.97	0.92	0.96	28
Multnomah County	1.28	3.62	3.01	2.32	41

[a]The Unhealthy Food indicator is compiled from a list of NAICS codes (North American Industry Classification System) that includes Fast-Food Restaurants (722211), Convenience Stores (445120), Beer, Wine, and Liquor Stores (445310), and Gasoline Stations with Convenience Stores (447110).
[b]The Supermarkets and Grocery Store indicator is compiled from a list of NAICS codes (North American Industry Classification System) that includes supermarkets and other grocery stores (445110)
[c]The Supplemental Food Programs indicator includes sites that provide access to supplemental food (food pantries) and summer food programs for children
[d]The Farmers' Market indicator provides information on access to fresh foods and was manually compiled from the national list maintained by the U.S. Department of Agriculture and other sources including Portland Farmers' Markets and the Oregon Environmental Council. The list of farmers' markets was combined with produce stands retrieved from a list of NAICS codes (North American Industry Classification System) that includes fruit and vegetable markets (permanent) (445230)

OPPORTUNITIES FOR SOCIAL COHESION

Social cohesion, or social capital, refers to the degree to which people know, trust, and interact with other members of their community, and the degree to which people are involved in organizing or influencing their community. High levels of social cohesion can contribute to positive health outcomes by enabling the dissemination of health-related information such as medical care options, establishing and maintaining social norms and practices associated with healthful behaviors, and by discouraging unhealthful behaviors such as smoking and drug use. In addition, higher levels of social cohesion have been correlated with increased rates of physical activity, including walking and biking among both children and adults.

Numerous features of a community can contribute to social cohesion, including faith-based institutions, community centers, the presence of arts and cultural organizations and civic and community organizations, and public libraries. In general, the more opportunities for social cohesion there are in a community, the more cohesive a community is likely to be. As Table 13 indicates, the plan areas have relatively few of these features compared to the county as a whole.

Table 13. Proximity to Opportunities for Social Cohesion, by Plan Area

Plan Area (Tract)	Faith Based Institutions[a]	Community Spaces[b]	Arts and Culture Orgs.[c]	Civic and Community Orgs.[d]	Public Libraries[e]	Composite
East of Sandy River (105)	1.01	0.95	0.99	0.98	0.95	8
West of Sandy River (104.02)	1.57	1.11	1	1.19	0.98	13
West Hills (70)	1.33	1.38	1.73	1.54	1.01	19
Sauvie Island (71)	0.97	0.95	0.96	1.02	0.92	8
Multnomah County	4.07	3.70	3.46	3.63	1.78	65

[a] The Faith-Based Institutions indicator is compiled from a list of NAICS codes (North American Industry Classification System) that includes (1) establishments primarily engaged in operating religious organizations, such as churches, religious temples, and monasteries, and/or (2) establishments primarily engaged in administering an organized religion or promoting religious activities (813110).

[b] The Community Spaces and Indoor Gathering Places indicator is compiled from a list of NAICS codes (North American Industry Classification System) that includes civic and social organizations (813410) and coffee shops (722213) as well as schools, community centers and grange associations.

[c] The Arts and Culture indicator is compiled from a list of NAICS codes (North American Industry Classification System) that includes Theater Companies and Dinner Theaters (711110), Dance Companies (711120), Musical Groups and Artists (711130), Other Performing Arts Companies (711190), Museums (712110), Historical Sites (712120), and Zoos and Botanical Gardens (712130) as well as a list of arts and culture organizations in Oregon provided by the Oregon Cultural Trust and a list of the location of street art provided by the Regional Arts and Culture Council (RACC). A list of additional arts and culture organizations in Clark County, Washington, was compiled by Arts of Clark County. Duplicates resulting from aggregation of these various data sources were removed in the dataset.

[d] The Civic and Community Organizations indicator is compiled from a list of NAICS codes (North American Industry Classification System) that includes civic and social organizations (813410), human rights organizations (813311), other social advocacy groups (813319), and other similar organizations (813990).

[e] The Public Libraries indicator is compiled from the Metro RLIS dataset.

ACCESS TO ESSENTIAL RETAIL AND SERVICES

Access to basic goods and services, including health and social services, can impact a person's ability to meet their daily needs and maintain good health. As Table 14 indicates, the plan areas have uniformly lower access to these goods and services than the county as a whole, with Sauvie Island and East of the Sandy River having the least access.

Table 14. Proximity to Essential Retail and Services

Plan Area (Tract)	Primary Care[a]	Essential Retail[b]	Public Services[c]	Health and Human Services[d]	Services Composite
East of Sandy River (105)	0.95	0.97	0.98	0.96	8
West of Sandy River (104.02)	0.99	1.62	0.98	1.04	12
West Hills (70)	1.57	1.59	1.21	1.46	19
Sauvie Island (71)	1.03	1.00	0.96	0.96	8
Multnomah County	3.49	4.18	2.18	3.52	64

[a] The Proximity to Primary Care Facilities indicator shows distance to primary medical care facilities including family/general medicine, pediatrics and obstetrics.
[b] The Key Retail Services indicator is compiled from a list of NAICS codes (North American Industry Classification System). The industries included in the indicator were chosen based on an index created by the San Francisco Department of Public Health's Healthy Development Measurement Tool
[c] The Public Services indicator is compiled from point data in the Metro RLIS dataset (city halls, fire stations, hospitals) supplemented by a list of NAICS codes (North American Industry Classification System) that includes Courts (922110), Police Protection (922120), Fire Protection (922160), Government Executive Offices (921110), and Postal Service (491110).
[d] The Human and Social Services indicator is compiled from a list of NAICS codes (North American Industry Classification System) that includes Individual and Family Services (624190), Child and Youth Services (624110), Services for Elderly and Persons with Disabilities (624120), Temporary Shelters (624221), and Other Community Housing Services (624229)

HEALTH OUTCOMES

While data on most health outcomes is available only at the county or state level, the Equity Atlas provides Census block group level data on overweight and obesity, and Census tract level data on diabetes, heart disease, and asthma, all of which are associated with how communities are planned and developed.

OVERWEIGHT AND OBESITY

Overweight and obesity are commonly defined by the metric, Body Mass Index (BMI). BMI reflects a proportional relationship and provides a measure of how much an individual's body weight varies from what is normal for a person of a particular height. A person with a BMI below 18.5 is defined as underweight, a BMI between 18.5 and 24.9 is considered normal, a BMI between 25 and 29.9 is considered overweight, and a BMI of 30 or greater is considered obese. As the data in Table 15 indicates, with the exception of the West Hills, residents in each of the other plan areas have an average BMI slightly higher than the county as a whole (less than 4% at most).

Table 15. Body Mass Index[a] by Plan Area

Plan Area	Average BMI
Multnomah County	**24.8**
East of Sandy River	**25.6**
Tract 105, BG 1	*25.8*
Tract 105, BG 2	*25.8*
Tract 105, BG 3	*25.1*
Tract 105, BG 4	*25.4*
West of Sandy River	**25.4**
Tract 99.07, BG 3	*25.1*
Tract 104.02, BG 1	*25.8*
Tract 104.02, BG 2	*25.8*
Tract 104.02, BG 3	*25.1*
Tract 104.09, BG 3	*25.6*
West Hills	**23.8**
Tract 70, BG 1	*23.5*
Tract 70, BG 2	*23.7*
Tract 70, BG 3	*24.2*
Tract 70, BG 4	*23.3*
Tract 71, BG 1	*25.0*
Sauvie Island	**25.1**

[a] This data is derived from Oregon driver's license information (OR DMV) and is thus self-reported. While it is likely that weight is under-estimated, research indicates that the rate of under-reporting of weight in DMV records is relatively consistent, so the dataset is still useful for describing patterns.

Table 16 lists the rates of three key planning-related chronic health issues asthma, heart disease, and diabetes for each of the plan areas. While the areas east and west of the Sandy River are fairly similar to the county as a whole, the West Hills and Sauvie Island are somewhat healthier than the county as a whole.

Table 16. Rates of Asthma, Heart Disease, and Diabetes by Plan Area[a]

Plan Area (Tract)	Asthma	Heart Disease	Diabetes
East of Sandy River (105)	15.6%	2.1%	7.6%
West of Sandy River (104.02)	12.1%	1.6%	7.4%
West Hills (70)	11.6%	1.0%	3.6%
Sauvie Island (71)	12.1%	2.0%	4.7%
Multnomah County	14.3%	1.5%	7.5%

[a] Data on the indicators for Rates of Asthma, Diabetes and Heart Disease are compiled from insurer claims data submitted to Oregon Health Care Quality Corporation. Data include administrative claims (billing) data from eight commercial health plans, two Medicaid managed care plans and the Oregon Health Authority Division of Medical Assistance Programs (Medicaid)

IMPLICATIONS FOR PLANNING

These population and demographic conditions have a number of potential implications for the Multnomah County Comprehensive Plan Update.

- The rural areas of the County have a very low population density, with only approximately 25,000 residents living in a very large area. This will impact the average cost and ability to deliver public services and the proximity to centralize public services, as well as shopping areas or other amenities. Additionally, rural resource protection zoning does not permit service and retail uses, posing another obstacle to locating these types of amenities in proximity to many rural residents.
- The population of the rural parts of the county have increased at a greater rate than that of the county as a whole, though increases are still low in absolute terms.
- The rural areas of the county have a higher proportion of white residents than the county as a whole. One notable exception is a high proportion (11%) of Asian residents in the West Hills area. This may mean a relatively lower need for Spanish or possibly other translation services for public engagement efforts compared to other portions of Multnomah County.
- The study tracts have a higher proportion of family households than the county as a whole and a higher median age as well. Sauvie Island has a median age of 50. Higher median ages have implications related to access to health and social services, issues associated with aging in place and need for and ability to access transit services (combined with the dispersed nature of population and the cost of providing such services).
- The study tracts are generally better off economically than the county as a whole, with a higher median income, lower poverty levels, and lower unemployment rate (though margins of error are high in this case).
- Relative to other portions of the County, the rural areas in the County lack access to a number of features that can help improve public health, including access to healthy food, access to certain types of physical activity opportunities, proximity to essential retail services, and access to opportunities for social cohesion. Planning and policies to enhance access to these opportunities should be considered during the Comprehensive Plan Update process. However, state requirements associated with rural zoning present an obstacle to doing this to some degree.
- Despite the relative lack of access to features that can improve public health, measured health indicators for residents of the rural areas such as body mass index and rates of asthma, heart disease and diabetes do not differ markedly than for residents in the County as a whole.

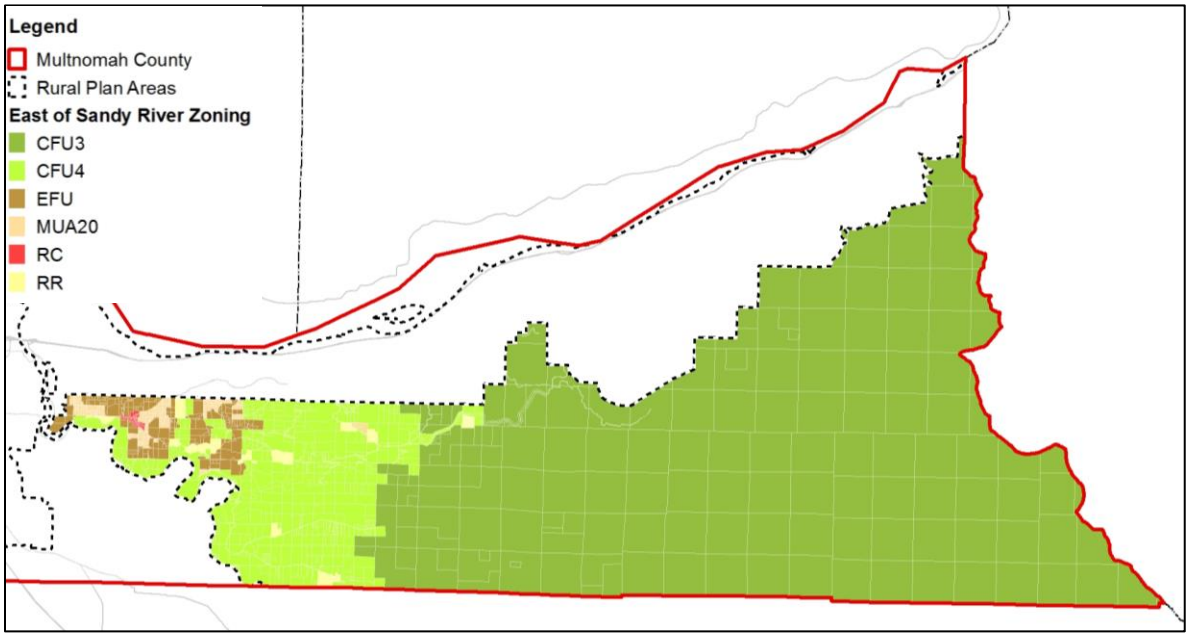
ZONING & DEVELOPMENT

This section describes zoning designations, land use, parcel size, and vacancy status in each of the plan subareas.[8]

EAST OF SANDY RIVER

The East of Sandy River Rural Area is generally characterized by natural and commercial timber forests over the vast majority of its area, much of which is within the Mt. Hood National Forest. The western-most portion of this Rural Area contains the vast majority of the non-forest uses, mainly consisting of agricultural, rural residential, and rural service development.

Figure 6. East of Sandy River Zoning and Parcels



[8] This section uses both zoning data and taxlot data to describe the zoning and development characteristics of each subarea, with the following general caveats:

- Zoning designations, property lines, and subarea boundaries do not necessarily line up with one another. Taxlots were chosen based on whether their "centroid" was within the subarea, and some taxlots have multiple zoning designations.
- There are occasionally duplicate records of taxlots of identical size and shape. These records are only present to a significant degree in the West Hills subarea, where duplicates have been removed for this analysis. Most (but not all) duplicate records have the same property code and other information.
- Land use information is based upon tax assessor property classifications. These consist of use categories and improvement designations. Use categories include residential, commercial, industrial, farm, forest, multi-family, recreation, tract, and exempt uses. Improvement designations include "Vacant" (land only, without any built structures), "Improved" (with typical structures for the use category such as barns, sheds or other agricultural structures in farm zones), and other specialized designations. Detailed information can be found in the *Assessor's Certified Ratio Study Procedures Manual* (available online at http://library.state.or.us/repository/2010/201007231056085/index.pdf)

The East of Sandy River subarea consists of roughly 1,338 taxlots in 82,146 acres, or an average parcel size of 61 acres. There are a number of very large parcels in this subarea, with 129 parcels greater than 150 acres in size taking up nearly 80% of the land, the bulk of which is federally-owned.

Zoning designations and their descriptions are found in Table 17. Land zoned for commercial forest use makes up over 80% of the land in this subarea.

Table 17. East of Sandy River Subarea - Zoning Designations

Zone	Detail	Acres	
CFU3	Commercial Forest Use	67,471	81%
CFU4	Commercial Forest Use	11,917	14%
EFU	Exclusive Farm Use	2,063	2%
MUA20	Multiple Use Agriculture	703	1%
RC	Rural Commercial	73	0%
RR	Rural Residential	696	1%

Source: Multnomah County GIS

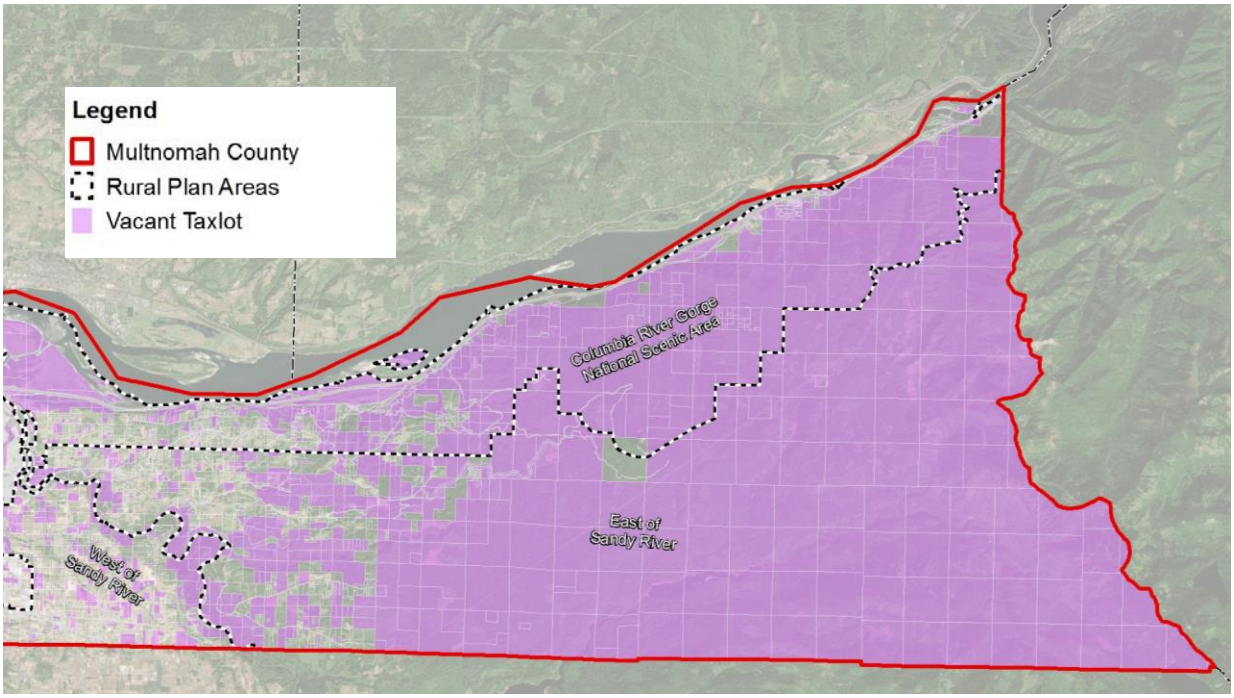
Table 18. East of Sandy River Subarea – Property Classification

Land Use	Number of Taxlots		Total Acres	
TOTAL	**1,338**	**100%**	**82,146**	**100%**
Residential	**221**	**16.5%**	**1,941**	**2.4%**
Vacant	58	4.3%	1,532	1.9%
Improved	97	7.2%	214	0.3%
Manufactured Structure	66	4.9%	195	0.2%
Commercial	**14**	**1.0%**	**685**	**0.8%**
Improved	14	1.0%	685	0.8%
Tract	**506**	**37.8%**	**60,850**	**74.1%**
Vacant	232	17.3%	59,463	72.4%
Improved	272	20.3%	1385	1.7%
State Responsibility	2	0.1%	2	0.0%
Farm	**153**	**11.4%**	**1,707**	**2.1%**
Vacant	34	2.5%	324	0.4%
Improved	119	8.9%	1,382	1.7%
Forest	**443**	**33.1%**	**16,931**	**20.6%**
Vacant	196	14.6%	12,144	14.8%
Improved	247	18.5%	4,786	5.8%
Recreation	**1**	**0.1%**	**32**	**0.0%**
Improved	1	0.1%	32	0.0%

Source: Multnomah County GIS, tax assessor property classification

Land use and development is characterized in Table 18 using tax assessor property codes. Tract land[9] makes up the majority (74.1%) of acreage in the East of Sandy River subarea, and the plurality (37.8%) of the number of taxlots. This land is primarily zoned for commercial forest use and much of it is in forest production. Additionally, 39% of the parcels comprising nearly 90% of the land in this subarea are designated as Vacant. Improved properties and/or those with a manufactured structure are concentrated in the western portion of this area, near Corbett and Springdale. Residential land with improvements or manufactured homes makes up only about 0.5% of the land area in the East of Sandy River subarea. Land developed for commercial purposes also makes up a very small proportion of the land area (less than 1 percent) and similarly is concentrated in the western portion of this planning area.

Figure 7. Vacancy Status – East of Sandy River



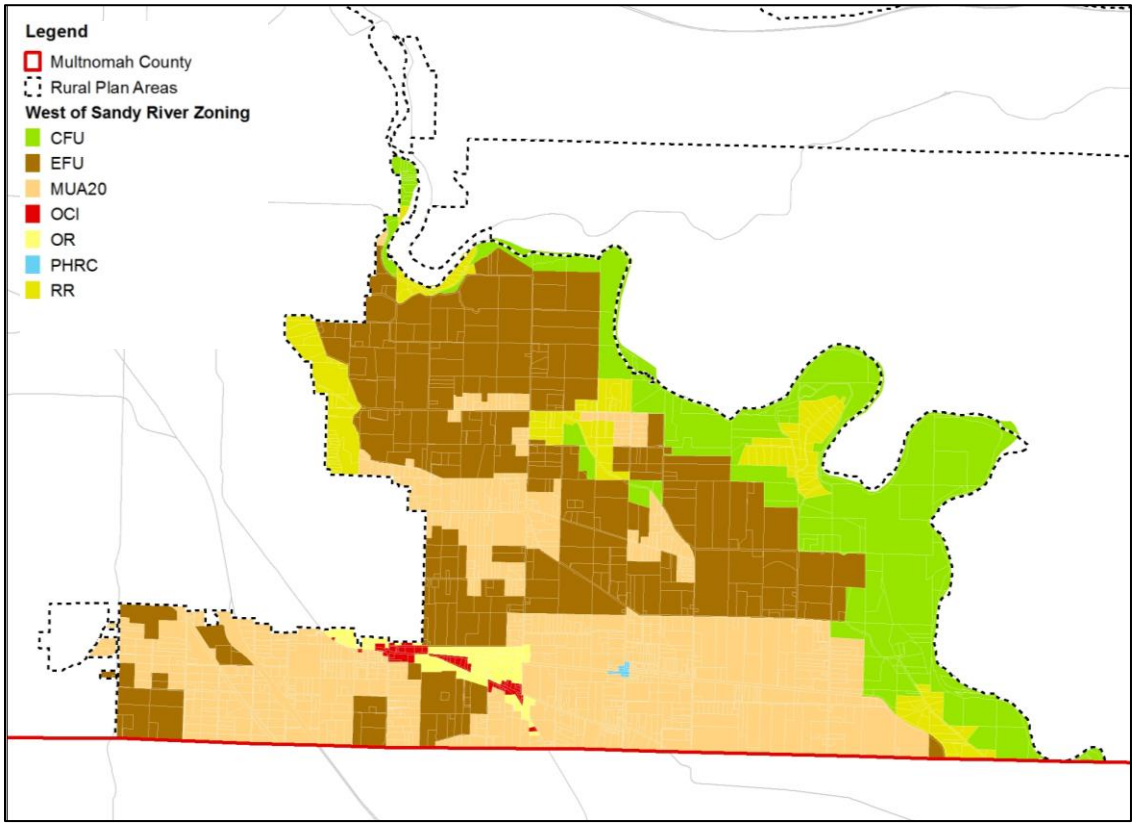
[9] Tract Land is defined in the *Assessor's Certified Ratio Study Procedures Manual* (available online at http://library.state.or.us/repository/2010/201007231056085/index.pdf) as "parcels…where the highest and best use is for development to a suburban or rural homesite, but the land is not divided into urban type lots." This assessor's definition frequently is not consistent with the use, ownership characteristics, state land use planning guidelines or regulation of allowed uses of this land.

WEST OF SANDY RIVER

The West of Sandy River rural area is bounded on the east and north by the Sandy River, on the south by Clackamas County, and on the west by the city limits of Gresham and Troutdale. The area includes a narrow western leg bounded on the north and west by the city limits of Gresham and on the south by Clackamas County, and in island of rural land along Rodlun Road between Gresham and the County line. The area is open to urban influence to a greater degree than the other plan areas due to a lack of physical barriers, such as the steeper topography of West Hills, and the limited access to Sauvie Island and the East of Sandy River area.

The plan area is characterized by rural agricultural land bisected by several riparian corridors. The predominant land uses in the plan area are nurseries, berry farms and pastures. The plan area is located in two major drainage basins, the Sandy River and the Willamette River via Johnson Creek. Three large riparian systems are present: Beaver Creek, which flows northwest through the central portion of the area to the Sandy River; Johnson Creek, which flows west along the southern portion of the area to the Willamette; and the Sandy River, which forms the north and east plan area boundary. Kelly Creek North (a tributary to Beaver Creek) and Kelly Creek South (a tributary to Johnson Creek) as well as many unnamed tributaries to Beaver Creek, Johnson Creek and the Sandy River are present in the plan area.

Figure 8. West of Sandy River Zoning and Parcels



The West of Sandy River subarea consists of roughly 1,719 taxlots in 9,188 acres, or an average parcel size of 5.3 acres. It is more urban in character, with roughly 75% of taxlots below 5 acres in size. Over 95% of taxlots in this subarea are less than 25 acres. Zoning designations and their descriptions are found in Table 19.

Table 19. West of Sandy River Subarea - Zoning Designations

Zone	Detail	Acres	
CFU	Commercial Forest Use	2,153	22%
EFU	Exclusive Farm Use	3,584	36%
MUA20	Multiple Use Agriculture	3,366	34%
OCI	Orient Commercial - Industrial	51	1%
OR	Orient Rural Center Residential	152	2%
PHRC	Pleasant Home Rural Center	5.6	0%
RR	Rural Residential	644	6%

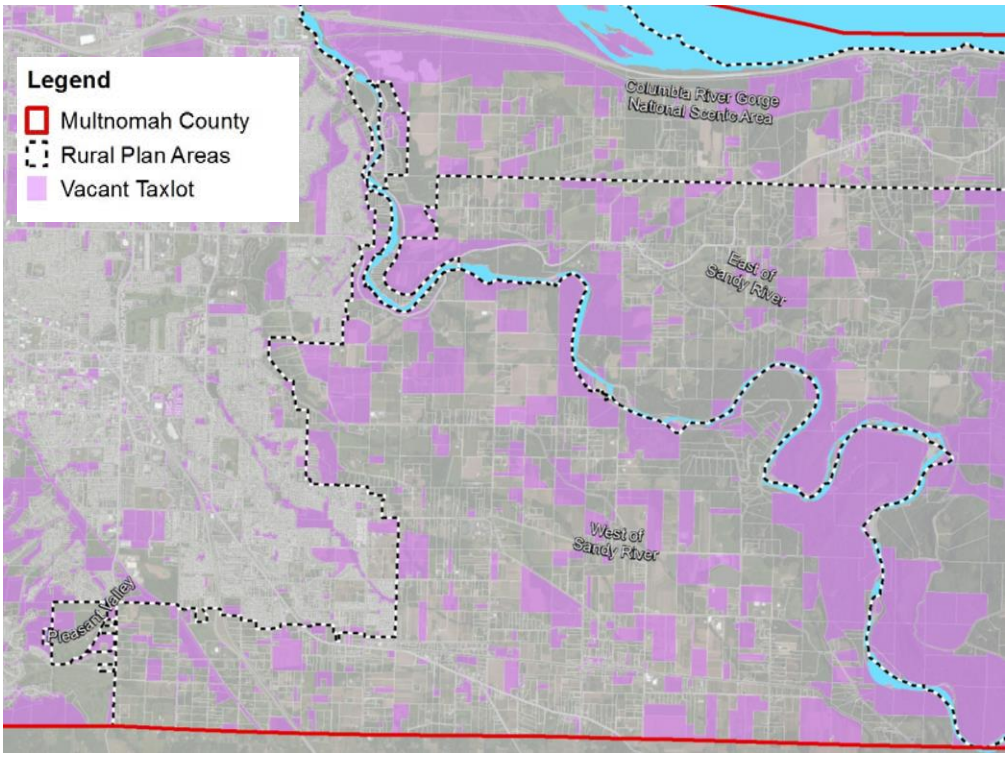
Table 20. West of Sandy River Subarea – Property Classification

Land Use	Number of Taxlots		Total Acres	
TOTAL	**1,719**	**100%**	**9,188**	**100%**
Residential	**400**	**23.3%**	**953**	**10.4%**
Vacant	90	5.2%	285	3.1%
Improved	240	14.0%	489	5.3%
Manufactured Structure	70	4.1%	179	2.0%
Commercial	**52**	**3.0%**	**233**	**2.5%**
Vacant	3	0.2%	2	0.0%
Improved	46	2.7%	214	2.3%
Condominium	1	0.1%	15	0.2%
State Responsibility	2	0.1%	2	0.0%
Industrial	**2**	**0.1%**	**27**	**0.3%**
State Responsibility	2	0.1%	27	0.3%
Tract	**812**	**47.2%**	**2,664**	**29.0%**
Vacant	173	10.1%	1,013	11.0%
Improved	637	37.1%	1,645	17.9%
State Responsibility	2	0.1%	6	0.1%
Farm	**356**	**20.7%**	**4,356**	**47.4%**
Vacant	108	6.3%	1,320	14.4%
Improved	248	14.4%	3,036	33.0%
Forest	**93**	**5.4%**	**937**	**10.2%**
Vacant	20	1.2%	217	2.4%
Improved	73	4.2%	720	7.8%
Multi-Family	**3**	**0.2%**	**4**	**0.0%**
Improved	3	0.2%	4	0.0%
Exempt	**1**	**0.1%**	**13**	**0.1%**
State Responsibility	1	0.1%	13	0.1%

Source: Multnomah County GIS, tax assessor property classification

Land use and development is characterized in Table 20. Farm land is the largest category in terms of acreage, taking up 46.7% of the land in the West of Sandy River subarea. However, Tract land comprises the plurality of taxlots (47.6%). Additionally, 31% of the land is categorized as Vacant (23% of taxlots). While not a significant percentage of the total, the West of Sandy River area contains much more residential and commercial land compared to the East of Sandy River subarea. A significant amount of the vacant land in the area is found on parcels directly adjacent to the Sandy River.

Figure 9. Vacancy – West of Sandy River



PLEASANT VALLEY

The Pleasant Valley subarea is under County zoning but lies within the urban growth boundary and is being planned by Gresham for eventual annexation into the City. Land within this subarea will be zoned and developed in accordance with the Pleasant Valley Plan. This subarea consists of 161 taxlots in 649 acres, or an average parcel size of 15.6 acres. Zoning designations and their descriptions are found in Table 21. The majority of the land in this area is currently zoned for rural residential use. About 18% of the land is now zoned as "Future Urban".

Table 21. Pleasant Valley Subarea - Zoning Designations

Zone	Detail	Acres	
UF20	Urban Future District	116	18%
LM	Light Manufacturing	10	1%
C3	Retail Commercial	5.6	1%
RR	Rural Residential	530	80%

This subarea is predominately Tract lands, 75.8% of taxlots and 65.3% of total acreage. Only a small portion (8.4% of land area) of this tract land is designated as vacant. Improved residential parcels and those with manufactured structures make up just over 12% of the land area.

Table 22. Pleasant Valley Subarea – Property Classification

Land Use	Number of Tax Lots		Total Acres	
TOTAL	**161**	**100%**	**649**	**100%**
Residential	**17**	**10.6%**	**103**	**15.8%**
Vacant	2	1.2%	22	3.4%
Improved	10	6.2%	60	9.3%
Manufactured Structure	5	3.1%	20	3.2%
Commercial	**7**	**4.3%**	**25**	**3.9%**
Vacant	1	0.6%	10	1.6%
Improved	6	3.7%	15	2.3%
Tract	**122**	**75.8%**	**424**	**65.3%**
Vacant	26	16.1%	55	8.4%
Improved	96	59.6%	369	56.9%
Farm	**13**	8.1%	**71**	11.0%
Vacant	3	1.9%	8	1.3%
Improved	**10**	**6.2%**	**63**	**9.7%**
Forest	**2**	**1.2%**	**26**	**3.9%**
Improved	2	1.2%	26	3.9%

Source: Multnomah County GIS, tax assessor property classification

Figure 10. Pleasant Valley Zoning and Parcels

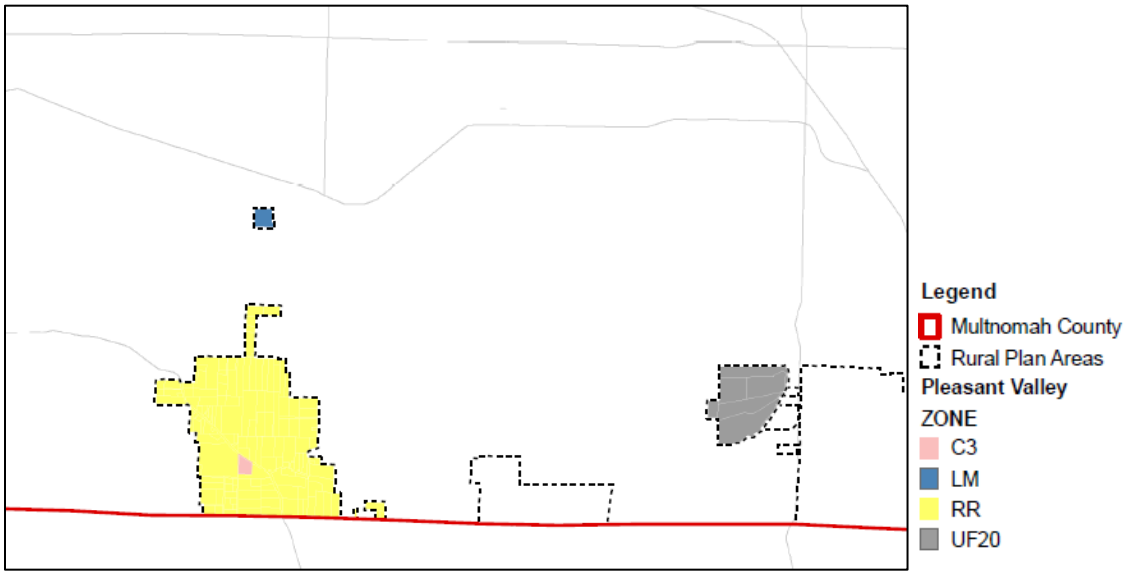
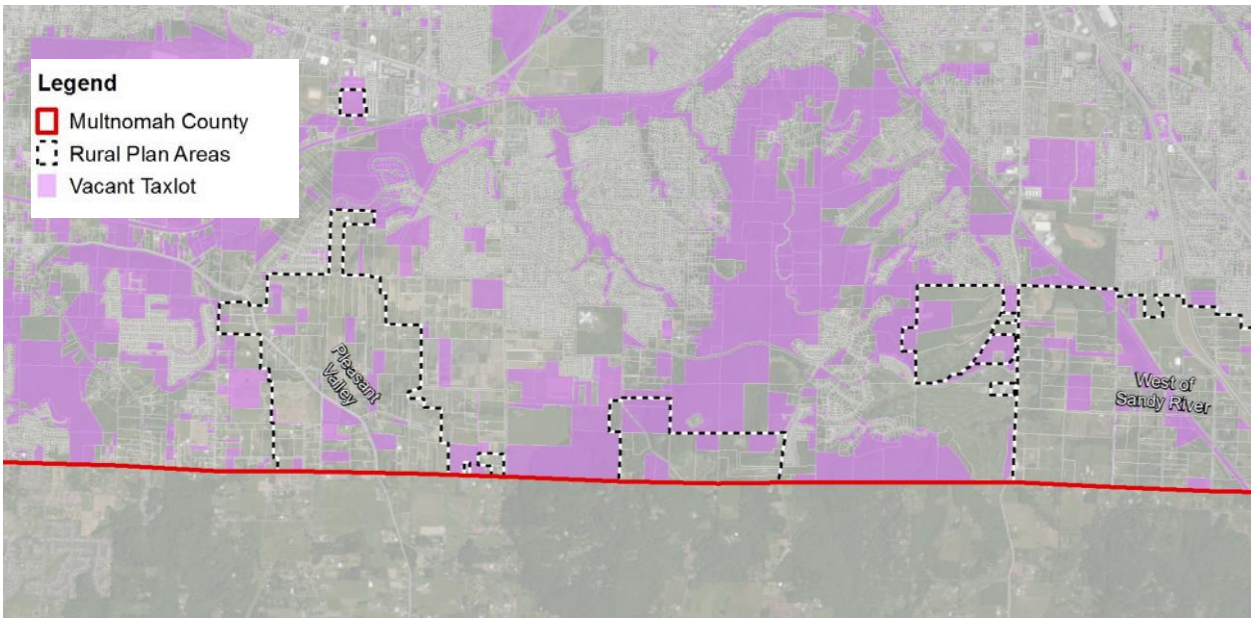


Figure 11. Vacancy Status – Pleasant Valley



INTERLACHEN

Interlachen is a small residential community located between Fairview Lake and Blue Lake and is surrounded by the City of Fairview. It is zoned entirely Urban Low Density Residential and largely built out. Average parcel size is a quarter of an acre. The majority of the area zoned as LR5 represents land covered by the two lakes.

Table 23. Interlachen Subarea - Zoning Designations

Zone	Detail	Acres	
LR10	Urban Low Density Residential	4.6	3%
LR5	Urban Low Density Residential	43.1	27%
LR7	Urban Low Density Residential	113.5	70%

The vast majority is categorized as Improved Residential (90.9%). There is one tax lot designated as Recreation.

Table 24. Interlachen Subarea – Property Classification

Land Use	Number of Tax Lots		Total Acres	
TOTAL	**174**	**100%**	**42**	**100%**
Residential	**173**	99.4%	**41**	99.5%
Vacant	17	9.8%	4	8.5%
Improved	156	89.7%	38	90.9%
Recreation	**1**	0.6%	**0**	0.5%
Improved	1	0.6%	0	0.5%

Source: Multnomah County GIS, tax assessor property classification

Figure 12. Interlachen Zoning and Parcels

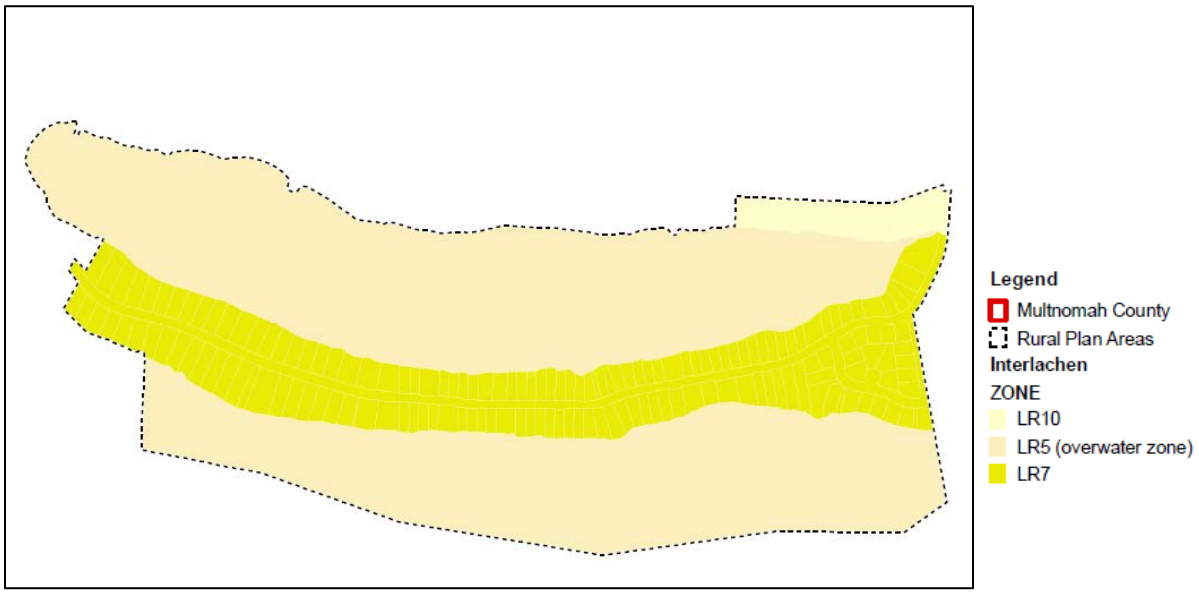


Figure 13. Vacancy Status – Interlachen

COLUMBIA RIVER GORGE NATIONAL SCENIC AREA

The Columbia River Gorge National Scenic Area covers 85 miles along the Columbia River, including portions of Multnomah, Hood River, and Wasco counties in Oregon and Clark, Klickitat, and Skamania counties in Washington, and the Mt. Hood and Gifford Pinchot National Forests. This analysis addresses the portion within Multnomah County.

The purposes of the Columbia River Gorge National Scenic Area Districts, consistent with the Columbia River Gorge National Scenic Area Plan are to protect and provide for the enhancement of the scenic, cultural, recreational, and natural resources of the Columbia River Gorge, and to protect and support the economy of the Columbia River Gorge by encouraging growth to occur in existing urban areas and by allowing future economic development in a manner that protects and enhances the scenic, cultural, recreational, and natural resources of the Gorge. The Special Management Area includes the region's most sensitive lands, concentrated primarily in the western half of the Scenic Area. Congress authorized the Gorge Commission to plan for General Management Area (GMA) lands, which include agricultural, forestry, and residential uses.

The Columbia River Gorge National Scenic Area subarea consists of 1416 taxlots in 32,354 acres, or an average parcel size of 22.8 acres. Zoning designations and their descriptions are found in Table 25.

Table 25. Columbia River Gorge National Scenic Area - Zoning Designations

Zone	Detail	Acres	
CFU3	Commercial Forest Use (min. lot size is 80 acres)	47	0%
CFU4	Commercial Forest Use (min. lot size is 80 acres)	99	0%
GGA20	General Management Area Agriculture	185	1%
GGA40	General Management Area Agriculture	970	3%
GGC	General Management Area - Commercial	2	0%
GGCR	General Management Area - Recreation	8	0%
GGF20	General Management Area – Forest	367	1%
GGF40	General Management Area – Forest	346	1%
GGF80	General Management Area – Forest	298	1%
GGO	General Management Area – Open Space	134	0%
GGOGW	General Management Area – Open Space	108	0%
GGPR	General Management Area – Recreation	140	0%
GGR10	General Management Area – Residential	670	2%
GGR2	General Management Area – Residential	218	1%
GGR5	General Management Area – Residential	660	2%
GGRC	General Management Area – Rural Center	123	0%
GSA40	Special Management Area – Agricultural	446	1%
GSF40	Special Management Area – Forest	5,790	16%
GSO	Special Management Area – Open Space	24,049	67%
GSPR	Special Management Area – Recreational	784	2%
GSR	Special Management Area – Residential	39	0%
MUF19	Multiple Use Forest	23	0%
RC	Rural Center District (min. lot size is 1 acre)	495	1%

Over 2,600 acres (80.4%) of the land in this subarea is designated as Tract land, which comprises over half of the areas taxlots (51.7%). The majority of this land is designated as “Special Management Area - Open Space,” and is comprised of large vacant taxlots in the southern and eastern portions of the subarea. Residential lands represent 29.5% of the taxlots but less than six percent of the total land area, and are concentrated in the western portion of the subarea. The majority of the residential land in this sub-area is vacant (about 70%), with only 1.3% of the total land area identified as improved residential land.

Table 26. Columbia River Gorge National Scenic Area Subarea – Property Classification

Land Use	Number of Tax Lots		Total Acres	
TOTAL	**1,416**	**100%**	**32,354**	**100%**
Residential	**418**	**29.5%**	**1,901**	**5.9%**
Vacant	198	14.0%	1,365	4.2%
Improved	173	12.2%	430	1.3%
State Responsibility	5	0.4%	8	0.0%
Manufactured Structure	42	3.0%	99	0.3%
Commercial	**55**	**3.9%**	**956**	**3.0%**
Vacant	2	0.1%	4	0.0%
Improved	51	3.6%	931	2.9%
Condominium	1	0.1%	19	0.1%
State Responsibility	1	0.1%	1	0.0%
Tract	**732**	**51.7%**	**26,026**	**80.4%**
Vacant	419	29.6%	24,960	77.1%
Improved	312	22.0%	1,066	3.3%
State Responsibility	1	0.1%	1	0.0%
Farm	**74**	**5.2%**	**993**	3.1%
Vacant	19	1.3%	223	0.7%
Improved	55	3.9%	770	2.4%
Forest	**123**	**8.7%**	**1,980**	**6.1%**
Vacant	33	2.3%	495	1.5%
Improved	90	6.4%	1,486	4.6%
Multi-Family	**1**	**0.1%**	**4**	0.0%
Improved	1	0.1%	4	0.0%
Recreation	**13**	**0.9%**	**494**	**1.5%**
Vacant	10	0.7%	388	1.2%
Improved	1	0.1%	49	0.2%
State Responsibility	2	0.1%	56	0.2%

Figure 14. Columbia River Gorge Zoning and Parcels

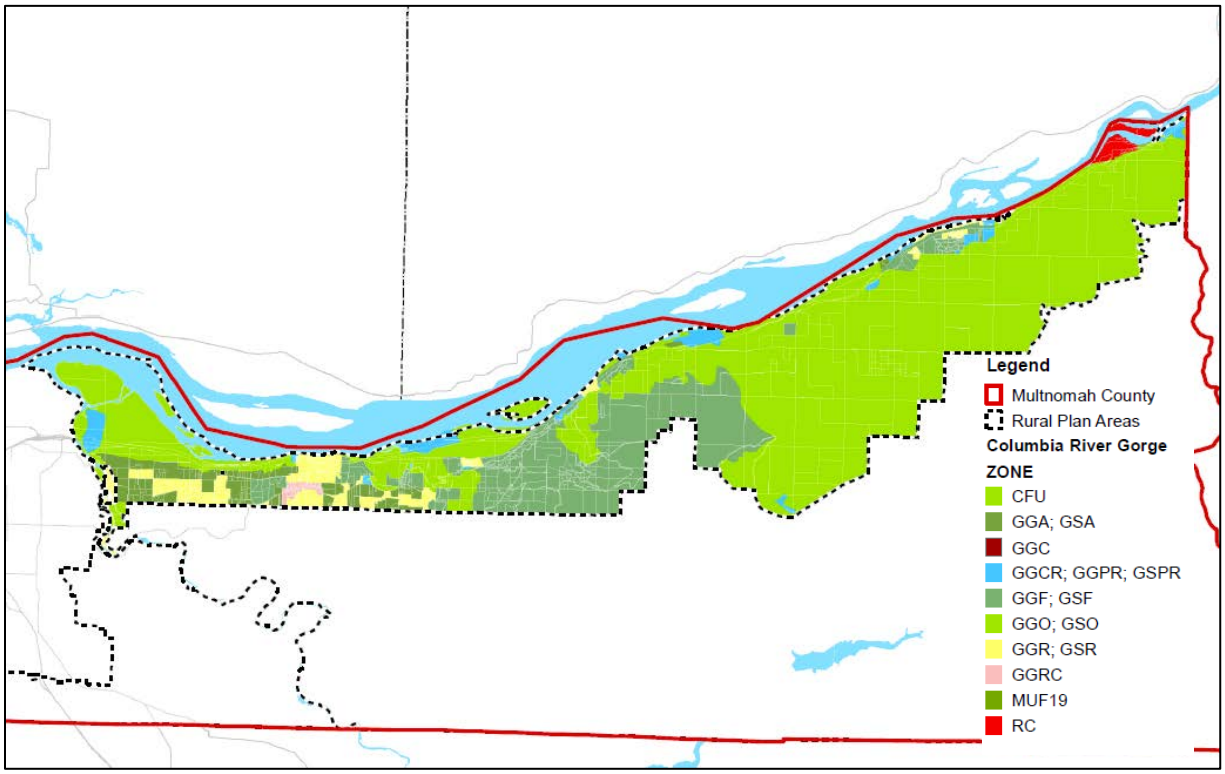
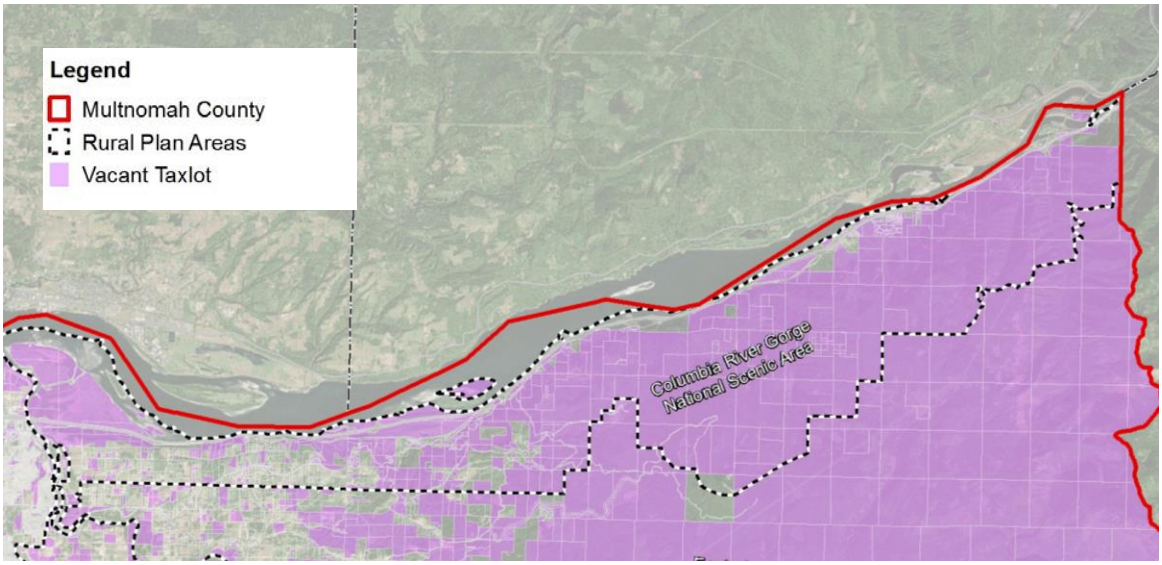


Figure 15. Vacancy Status – Columbia River Gorge



SAUVIE ISLAND

The Sauvie Island Rural Area includes those portions of Sauvie Island and the Multnomah Channel within Multnomah County. The Plan Area is bounded by U.S. Highway 30 on the west, Columbia County on the north, the Columbia River on the east, and the Willamette River and the city of Portland on the south. The area is dominated by agricultural uses and a wildlife refuge, with various water-related uses on and along Multnomah Channel, ranging from protected wetlands to marinas.

The rural area encompasses approximately 15,400 acres of land and several thousand additional acres of water. Approximately 11,800 of these acres are designated in the Comprehensive Framework Plan as Exclusive Farm Use, with the remainder designated as Multiple Use Agriculture.

The Plan Area lies to the north and west of the Portland Metropolitan Area's Urban Growth Boundary, with a direct common boundary only along the west side of Multnomah Channel where it bounds the City of Portland. Sauvie Island and Multnomah Channel provide a mixture of agricultural uses (due to the fine soils on the island protected by the levees of the Sauvie Island Drainage District), recreational uses (due to proximity to the Portland Metropolitan Area), and natural protected areas (primarily wetlands and water areas) which provide excellent wildlife habitat. This combination is unique to both Oregon and the entire nation. The island and channel area have been protected from creeping urbanization and unwanted regional urban-serving facilities by the vigilance of its residents and recreational users and the Oregon State and Multnomah County land use laws.

The Sauvie Island subarea consists of 613 taxlots in 15,417[10] acres, or an average parcel size of 25.2 acres. Zoning designations and their descriptions are found in Table 27.

Table 27. Sauvie Island Subarea - Zoning Designations

Zone	Detail	Acres
EFU	Exclusive Farm Use	12,074
MUA20	Mixed	6,429
RC	Rural Commercial	40

Farm land is the predominant land use in terms of total acreage (84.9%), however it consists of only 48.5% of the taxlots. Residential lands represent 41.4% of all taxlots and 10.4% of the total acreage. While a substantial number of tax lots in the area are classified as residential uses, virtually all of them are zoned for exclusive farm use. The majority of residential tax lots are improved (about 60% of them). However, vacant residential tax lots comprise about 60% of the land area of residential uses. Compared to other rural areas in Multnomah County, “tract” uses make up a much smaller percentage of the number of parcels and land area.

[10] This subarea contains areas over water considered zoned but not within any particular taxlot, accounting for the difference in acreage.

Table 28. Sauvie Island Subarea – Property Classification

Land Use	Number of Tax Lots		Total Acres	
TOTAL	**613**	**100%**	**15,417**	**100%**
Residential	**254**	**41.4%**	**1,607**	**10.4%**
Vacant	90	14.7%	1,056	6.8%
Improved	151	24.6%	475	3.1%
State Responsibility	6	1.0%	28	0.2%
Manufactured Structure	7	1.1%	49	0.3%
Commercial	**13**	**2.1%**	**175**	**1.1%**
Vacant	1	0.2%	0	0.0%
Improved	10	1.6%	175	1.1%
State Responsibility	2	0.3%	0	0.0%
Tract	**30**	**4.9%**	**294**	**1.9%**
Vacant	15	2.4%	144	0.9%
Improved	15	2.4%	151	1.0%
Farm	**297**	**48.5%**	**13,094**	**84.9%**
Vacant	103	16.8%	4,379	28.4%
Improved	194	31.6%	8,714	56.5%
Forest	**15**	**2.4%**	**189**	**1.2%**
Vacant	3	0.5%	1	0.0%
Improved	12	2.0%	187	1.2%
Multi-Family	**1**	**0.2%**	**4**	**0.0%**
Improved	1	0.2%	4	0.0%
Exempt[11]	**3**	**0.5%**	**54**	**0.4%**
Improved	1	0.2%	48	0.3%
Manufactured Structure	2	0.3%	6	0.0%

Source: Multnomah County GIS, tax assessor property classification

[11] "Exempt" property is under government or religious ownership, and is exempt from taxation.

Figure 16. Sauvie Island Zoning and Parcels

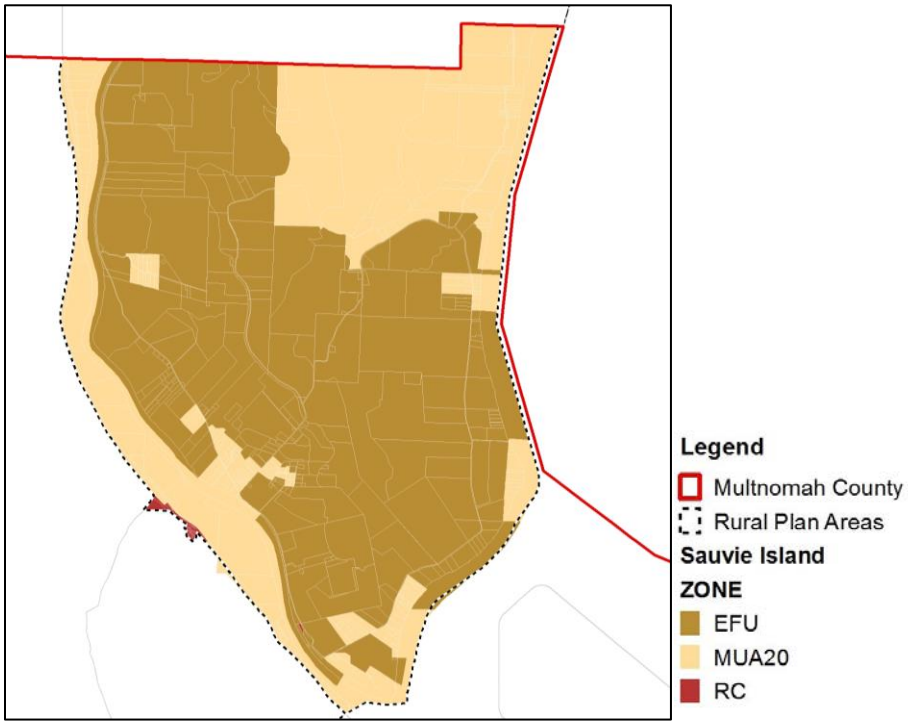
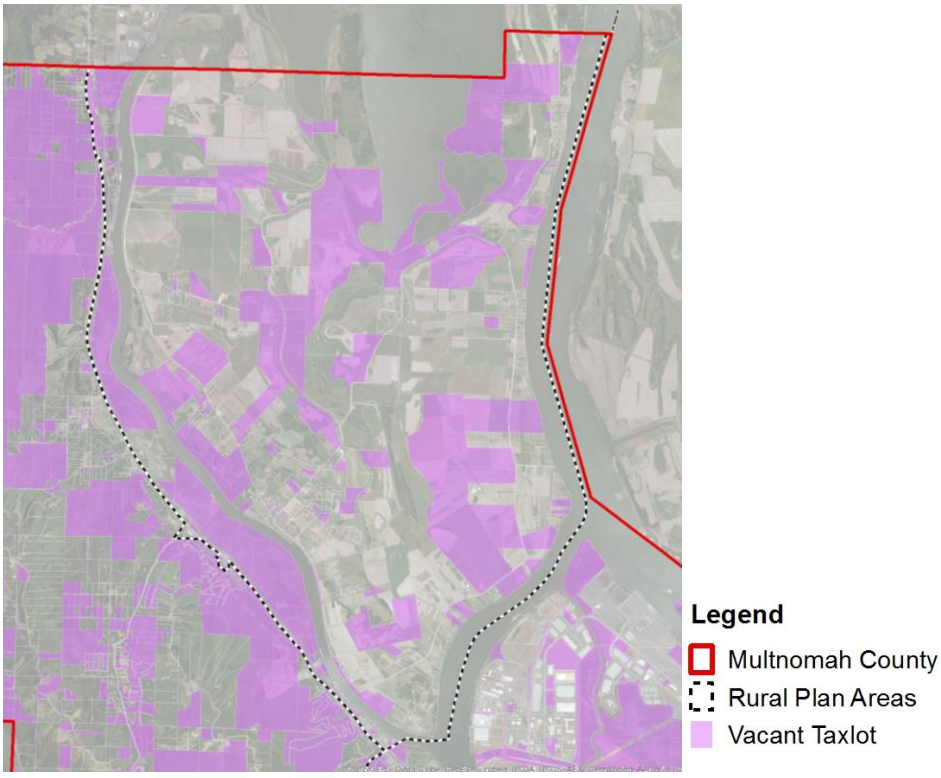


Figure 17. Vacancy Status – Sauvie Island



WEST HILLS

The West Hills subarea consists of roughly 1,888 taxlots in 21,500 acres. The average parcel size is just over 12 acres. Zoning designations and their descriptions are found in Table 29. The majority of land in this subarea (79 percent) is zoned for commercial forest use) while land zoned for rural residential use represents 10% of the total.

Figure 18. West Hills Zoning and Parcels

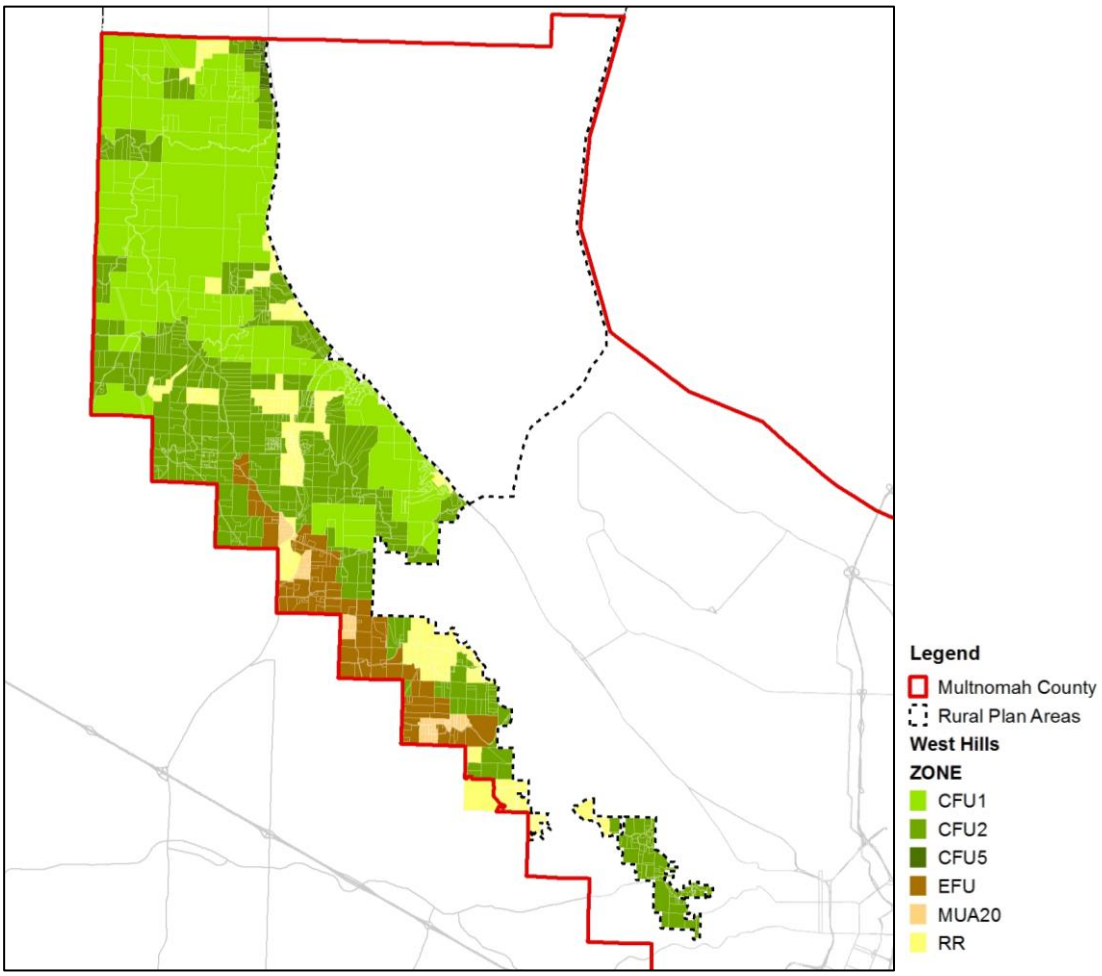


Table 29. West Hills Subarea - Zoning Designations

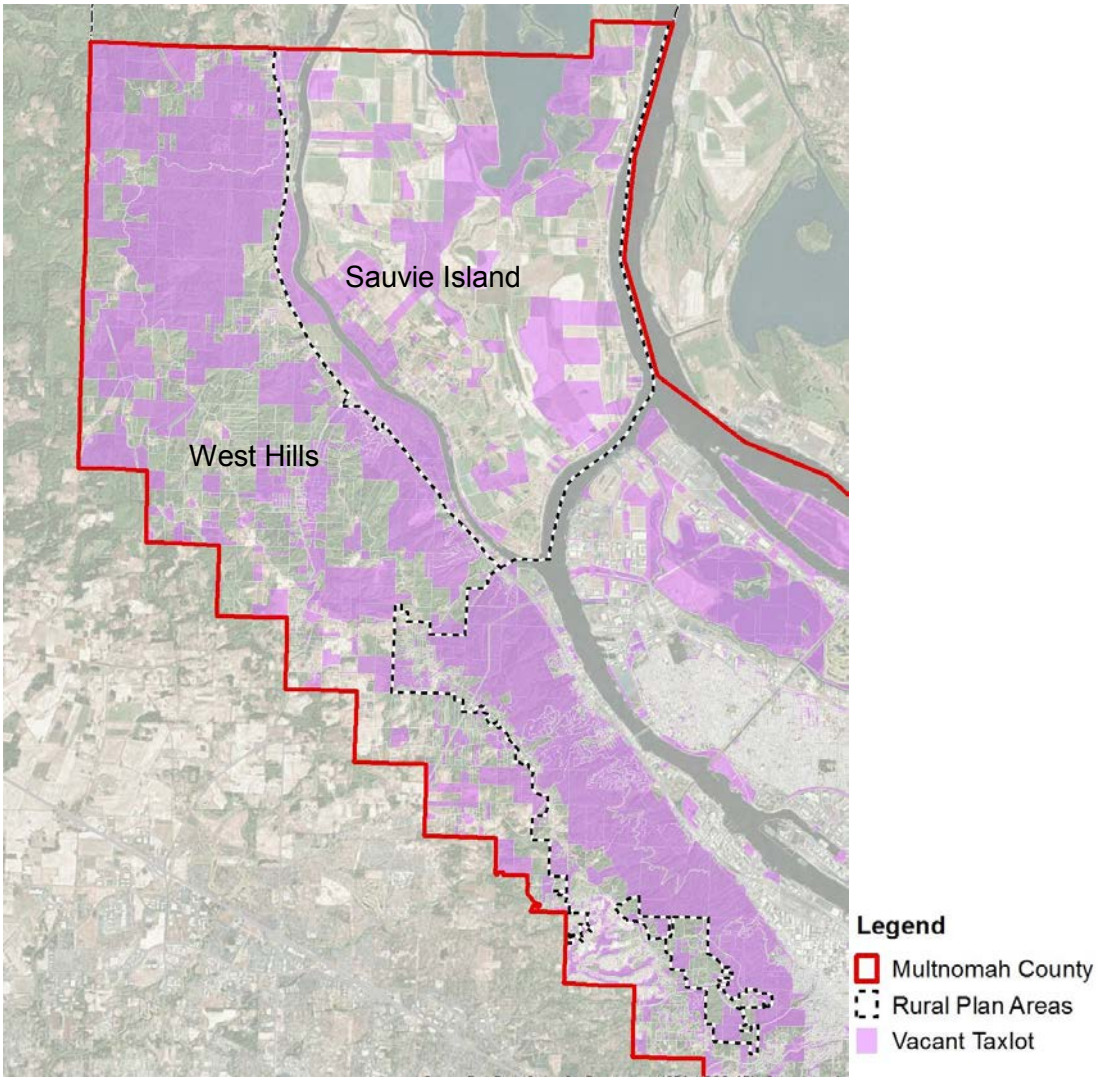
Zone	Detail	Acres	
CFU1	Commercial Forest Use	9,159	42%
CFU2	Commercial Forest Use	8,049	37%
CFU5	Commercial Forest Use	92	0%
EFU	Exclusive Farm Use	1,921	9%
MUA20	Mixed	299	1%
RR	Rural Residential	2,173	10%

Forest uses make up nearly 70% of the total acreage in the West Hills. There are over 700 taxlots (42.2% of total number of tax lots and 67% of the land) identified as in Forest use. There are 959 taxlots identified as having residential uses, representing just over 50% of the total lots. However, these lots total only 18.8% of the total acreage in the subarea.

Table 30. West Hills Subarea – Property Classification

Land Use	Number of Tax Lots		Total Acres	
TOTAL	**1888**	**100%**	**21,446**	**100%**
Residential	**959**	**50.8%**	**4035**	**18.8%**
Vacant	406	21.5%	2019	9.4%
Improved	493	26.1%	1727	8.1%
State Responsibility	29	1.5%	168	0.8%
Manufactured Structure	31	1.6%	121	0.6%
Commercial	**20**	**1.1%**	**141**	**0.7%**
Improved	18	1.0%	140	0.7%
State Responsibility	2	0.1%	1	0.0%
Tract	**88**	**4.7%**	**688**	**3.2%**
Vacant	30	1.6%	219	1.0%
Improved	50	2.6%	460	2.1%
State Responsibility	8	0.4%	9	0.0%
Farm	**95**	**5.0%**	**1494**	**7.0%**
Vacant	25	1.3%	275	1.3%
Improved	70	3.7%	1219	5.7%
Forest	**713**	**37.8%**	**14567**	**67.9%**
Vacant	298	15.8%	7718	36.0%
Improved	415	22.0%	6849	31.9%
Recreation	**13**	**0.7%**	**521**	**2.4%**
Vacant	12	0.6%	396	1.8%
Improved	1	0.1%	125	0.6%

Figure 19. Vacancy Status – West Hills



POLICY GAP ANALYSIS

This section compares the current Comprehensive Framework Plan (Comprehensive Plan) and Rural Area Plans (RAPs) to relevant state and regional planning requirements and policies in order to identify deficiencies in the current plans that should be addressed as part of this update process.

Current plans were reviewed against the following state and regional documents:

1. Statewide Planning Goals and associated Oregon Revised Statutes (ORS) and Oregon Administrative Rules (OARs)
2. Metro Planning Requirements and Policies
3. Selected County Policies and Planning Documents

This section identifies gaps that will inform work to be conducted in Tasks 5 and 6 of this project. Task 5 involves drafting new plan policies and Task 6 will provide draft code amendments to implement those policies. This section does not include transportation-related plans and policies which are covered in a third (following) section of this report.

STATE PLANNING REQUIREMENTS & POLICIES

STATEWIDE PLANNING GOALS

GOAL 1 – CITIZEN INVOLVEMENT: The Comprehensive Plan contains policies for citizen involvement and intergovernmental coordination (Policies 3 and 4) that address Statewide Goal 1. The policy language applies county-wide; it is not necessary for the individual RAPs to have additional policy language for Goal 1. Goal 1 is relatively general in nature and both the County's existing policies and the public involvement process being used to update the Comprehensive Plan appear to be consistent with Goal 1. However, additional policies related to public involvement could be incorporated in the updated Comprehensive Plan, if desired.

GOAL 2 – LAND USE PLANNING: Goal 2 requires local governments to establish, update as needed and implement Comprehensive Plans. The Goal prescribes general planning requirements, how and when local governments can take exceptions to this goals; and guidelines for Plan preparation, content, filing, revision implementation, and coordination with state and federal agencies. The County's Comprehensive Plan, in concert with the County Development Plan and Operations Plan, as well as other supporting functional and specific area plans (e.g., Rural Area Plans) appear to generally conform to the provisions of Goal 2. Although the existing Comprehensive Plan includes a very detailed set of planning policies and recommended implementation strategies, the preliminary policy audit being conducted separately as part of this project may indicate specific policy gaps in the Plan.

Recommendation: Policies related to land use planning should be reviewed further to ensure that they are consistent with County land use development and permitting processes, including development code requirements. The process of updating the Plan also will need to be

consistent with Goal 2 and the updated Comprehensive Plan will need to incorporate contents and reference implementing plans and regulations consistent with Goal 2.

GOAL 3 – AGRICULTURAL LANDS: This goal states that agricultural lands shall be preserved and maintained for farm use, consistent with existing and future needs for agricultural products, forest and open space and with the state's agricultural land use policy expressed in ORS 215.243 and 215.700. The Oregon Department of Land Conservation and Development (DLCD), with assistance from Angelo Planning Group, is currently preparing a set of model ordinance provisions to help counties ensure consistency with state statutes and administrative rules associated with farm and forest. County planning staff have been involved in this effort and a preliminary review of County standards indicates that they are consistent with or exceed state requirements.

Recommendations: As part of this Comprehensive Plan update, the County should use the results of the DLCD effort noted above to confirm that County policies and regulations are consistent with each other and with state requirements at a minimum and further determine whether additional policies or requirements are needed to meet County or community goals. While the project team has not yet done a thorough review and comparison between state requirements and County policies (this will be done as part of Task 5 of the project), an initial assessment indicates that Multnomah County's requirements exceed the minimum state requirements.

GOAL 4 – FOREST LANDS: This goal directs local governments to conserve forest lands by maintaining the forest land base. It also requires local jurisdictions to ensure that forest production is economical and consistent with the goal of protecting land, air and water quality, as well as wildlife habitat. The goal further local governments to inventory forest lands and apply zoning designations to allow for commercial forestry in these areas, including limiting other land uses that could significantly adversely affect forest operations and practices and to establish numeric standards for land divisions and standards for land uses in these areas. The goal refers to consistency with specific statutes. The Goal includes guidelines for planning and implementation related to inventory practices; management of air, land and water quality; land use and land division; reforestation; road and right-of-way location and standards; and managing conflicts between forest lands and adjacent zones and uses.

The County's Comprehensive Plan includes policies and implementation strategies that address the requirements and guidelines of the goal. The County's Development Code includes several commercial forestry zones that also implement and are generally consistent with the goal. The Comprehensive Plan and Development Code also include policies and standards to protect air, land and water quality and wildlife habitat within forest and other zones.

Recommendations: As part of this Comprehensive Plan update, the County should use the results of the DLCD effort noted under Goal 4 to confirm that County policies and regulations are consistent with each other and with state requirements at a minimum and further determine whether additional policies or requirements are needed to meet County or community goals. The project team also should review County policies and standards (this will be done as part of

Tasks 5 and 6 of the project) to ensure that policies and standards properly balance support of forest operations and practices with management of air, land and water quality and with forest property owners ability to economically conduct commercial forestry operations..

GOAL 5 – NATURAL RESOURCES, SCENIC AND HISTORIC AREAS, AND OPEN SPACES:

Because the County is doing a voluntary update of the Comprehensive Plan (outside of a required periodic review process), there is no requirement to conduct a complete Goal 5 inventory. However, the County may choose to add Goal 5 resources to its existing inventories if desired. Currently, the County has Goal 5 inventories and associated ESEEs for the eastern parts of the County (east and west of the Sandy River). The West Hills RAP identifies scenic resources, wildlife habitat, streams and some mineral/aggregate resources that have been inventoried pursuant to Goal 5. In addition, the recent update of the Sauvie Island RAP included a Goal 5 inventory based on a "literature review" of existing, readily available information about applicable natural resources but did not include an associated ESEE analysis or report. It also has not included a determination of significance for Goal 5 resources or any on-the-ground inventory of resources.

In order to add resources to its existing Goal 5 inventories, the County could take the following approaches, depending on "safe harbor" provisions that may or may not be in place:

- If safe harbor provisions, or provisions that can be demonstrated to be equivalent to safe harbor, are in place – the County may add resources to an inventory without conducting an ESEE analysis.
- If safe harbor (or similar) provisions are not in place, then the County must conduct an ESEE analysis for any new resources added to the inventories. Similarly, if the County revises existing code provisions in place to protect Goal 5 resources, and those revisions are not in line with safe harbor provisions – then an ESEE analysis must be conducted for areas and/or resources affected by the new regulations.

Recommendations: As part of this Comprehensive Plan update, the County will need to assess whether or not its existing Goal 5 code provisions are consistent with safe harbor provisions. In addition, the strategies under Policy 16A-L in the Comprehensive Plan will likely need to be revised to reflect inventories, EESE work, and mapping that has been done since the last update.

For wetlands, the County is not required to conduct a local inventory and may rely on state/federal data as needed. However, the Comprehensive Plan indicates that some wetlands and other water resources have been inventoried. If additional wetland inventories are conducted as part of this update, the same safe harbor rules mentioned above will apply.

For wildlife habitat, the County has inventories and ESEE analyses for the areas east and west of the Sandy River. However, these may need to be updated based on more recent habitat surveys if they are available; if that is the case, the ESEEs will need to be updated as well.

Historic resources have been inventoried and the County protects historic resources by applying a Historic Preservation overlay zone to sites that meet the criteria. To ensure consistency with

Goal 5, the County should consider including language with the Historical Site Criteria under Policy 16-I that ensures owner consent (the County cannot impose a historical site designation if the property owner does not consent).

For cultural resources, there are no applicable state requirements and the County is not mandated to conduct an inventory. However, as part of this plan update, the County will consult with the State Historic Preservation Office and tribal agencies to determine if significant cultural resources are present and should be addressed in this update process.

GOAL 6 – AIR, WATER AND LAND RESOURCES QUALITY: All waste and process discharges from future development, when combined with such discharges from existing developments shall not threaten to violate, or violate applicable state or federal environmental quality statutes, rules and standards. With respect to the air, water and land resources of the applicable air sheds and river basins described or included in state environmental quality statutes, rules, standards and implementation plans, such discharges shall not (1) exceed the carrying capacity of such resources, considering long range needs; (2) degrade such resources; or (3) threaten the availability of such resources. It is expected that the County can comply with these requirements by meeting Goal 5 requirements and deferring to state and federal requirements for air and water discharges.

GOAL 7 – AREAS SUBJECT TO NATURAL HAZARDS: There is no specific Administrative Rule or other state requirements associated with Goal 7 beyond the language of the Goal itself. The Goal provides only general guidance regarding reducing risks from natural hazards. The Comprehensive Plan contains policies related to natural hazards under Policy 14 Development Limitations and Policy 16 Natural Resources. In addition, the County Zoning Ordinance contains standards for development in the floodplain and in slope hazard areas. The Federal Emergency Management Agency (FEMA) requires local communities to maintain and enforce minimum floodplain management standards in order to be eligible to participate in the National Flood Insurance Program (NFIP). FEMA accepted floodplain maps compiled by Multnomah County in 1980. Recent and potential future decisions and requirements by the National Oceanic and Atmospheric Administration (NOAA) also may affect the need for potential changes to flood hazard regulations. These include a previous biological opinion issued by NOAA and potential requirements associated with channel migration discussed below.

Recommendations: Channel migration is also considered a potential natural hazard and is currently being evaluated by the National Oceanic and Atmospheric Administration (NOAA) which is considering establishing future federal regulations associated with these potential hazard areas. Those efforts may result in new state requirements for local governments to consider adopting into comprehensive plans that specifically address channel migration. If the NOAA study provides model policy language related to channel migration, the County should consider adoption of that language as appropriate, consistent with future state requirements.

In addition, the Department of Geology and Mineral Industries (DOGAMI) has recently developed new mapping data and protocols using laser-based data (called LIDAR) that can provide a much more accurate depiction of landslide locations than is currently available. LIDAR

maps have been produced for a number of Oregon counties, including Multnomah County. In addition, the Oregon Department of Land Conservation and Development (DLCD) is working with DOGAMI and several cities in northern Clackamas County to develop a model ordinance for use in minimizing risks from landslide and other hazards. Also, Marion County has recently prepared an updated natural hazards ordinance using LIDAR data.

While current state laws and administrative rules do not require it, the County may also want to create a new natural hazards policy section in the Comprehensive Plan that gathers all hazard-related policy language into one place. This will help coordinate hazard-related policy language that exists in the individual RAPs and the County's Hazard Mitigation Plan, as well as any new policy language related to channel migration and LIDAR information that becomes available. The Marion County ordinance and the ongoing work by DLCD could inform these efforts.

GOAL 8 – RECREATIONAL NEEDS: The statewide goal is: To satisfy the recreational needs of the citizens of the state and visitors and, where appropriate, to provide for the siting of necessary recreational facilities. Policies 39 and 40 of the Comprehensive Plan include language about parks and recreation planning and development requirements (mostly pertaining to bicycle and pedestrian connections and landscaped areas).

Recommendation: Policy 39 includes policies specific to a 40-mile loop trail system; this language should be updated to reflect the current status of that project. There are also some references to documents in these policies (for example, the 1984 Multnomah County Neighborhood Park Plan) that are likely outdated and should be revised or deleted as appropriate. Policy 40 seems to focus exclusively on bicycle and pedestrian connections and landscaping. The County may want to expand this section to include additional policies related to parks requirements for development, and to be consistent with the zoning and subdivision ordinances. At the same time, these policies should reflect the current agreement between the County and Metro regarding management of parks within the County.

In addition, policy language in the Comprehensive Plan should include specific reference to the RAPs and the unique recreational value of each (for example, tourism on Sauvie Island and Forest Park in the West Hills). Each RAP contains policy language about recreation that should be updated and incorporated as appropriate.

GOAL 11 – PUBLIC FACILITIES AND SERVICES: The goal requires local governments to plan and develop a timely, orderly and efficient arrangement of public facilities and services to serve as a framework for urban and rural development. Policies 37 and 38 of the Comprehensive Plan address public utilities and facilities; however, it appears they have not been updated since 1999. The Sauvie Island RAP includes a chapter for public and semi-public facilities and identifies key issues. The West Hills RAP refers to a potential new community facility plan for the Burlington Water District, and mentions the lack of public facilities serving the Balch Creek Basin area. The East of Sandy and West of Sandy RAPs contain limited information about public facilities and utilities, most of which is background information and not policy language.

Goal 11 also requires facility plans as follows:

"Cities or counties shall develop and adopt a public facility plan for areas within an urban growth boundary containing a population greater than 2,500 persons. To meet current and long-range needs, a provision for solid waste disposal sites, including sites for inert waste, shall be included in each plan."

"Counties shall develop and adopt community public facility plans regulating facilities and services for certain unincorporated communities outside urban growth boundaries as specified by Commission rules."

Recommendations: New and/or revised policy language is likely needed in the Comprehensive Plan to more specifically address Goal 11 and the requirement to plan and develop a "timely, orderly and efficient" arrangement of public facilities. Language should also be updated to reflect any master planning of public facilities that has been completed since 1999. Policy language should also include updated information about the four rural areas, particularly where deficiencies have been identified or recent projects have been completed. The project team also should review plans for unincorporated communities to ensure they are consistent with Goal 11 requirements and consider including references to those documents in the Public Facilities section of the Comprehensive Plan.

GOAL 12 – TRANSPORTATION: This goal is implemented through the Oregon Transportation Planning Rule (TPR). Consistency with the TPR and with other state, regional and local transportation plans and policies is being addressed in a subsequent section of this Report.

GOAL 13 – ENERGY CONSERVATION: Land and uses developed on the land shall be managed and controlled so as to maximize the conservation of all forms of energy, based upon sound economic principles. Policy 22 of the Comprehensive Plan addresses energy conservation and appears to be consistent with this goal. The four RAPs contain little to no language regarding energy conservation. No changes are recommended for this policy except to update as appropriate to reflect more recent information or current practices.

GOAL 14 – URBANIZATION: This goal provides for an orderly and efficient transition from rural to urban land use, to accommodate urban population and urban employment inside urban growth boundaries and to protect rural, and resource lands from urbanization and urban sprawl. Policies 6-12 of the Comprehensive Plan are the Urban/Rural Growth Management Policies for the County and provide consistency with Goal 14. It defines three Broad Land Area Classifications: urban, rural and natural resource. Policy 6A also establishes policies and strategies for urban and rural reserves, consistent with OAR 660-027 Urban and Rural Reserves in the Portland Metro Area. Changes are recommended for Goal 14 compliance to update information specific to the four RAPs as needed to reflect current information and any rural reserve designations that apply in those areas. Those updates include:

- Portions of the West Hills were designated as Rural Reserves (areas 9C and 9B)
- Portions of West of Sandy were designated as Rural Reserves (area 1B), Urban Reserves (area 1C), and undesignated.
- Portions of East of Sandy were also designated as Rural Reserves are 1B.

- In 2010, all of Sauvie Island was designated as a rural reserve. This is reflected in the recent draft updated Sauvie Island RAP.

GOAL 15 – WILLAMETTE RIVER GREENWAY: The purpose of Goal 15 is to, "To protect, conserve, enhance and maintain the natural, scenic, historical, agricultural, economic and recreational qualities of lands along the Willamette River…" The Goal requires that cities and counties update their comprehensive plans and implementing ordinances to establish boundaries, appropriate uses and acquisition areas consistent with the approved Department of Transportation Greenway Plan.

To address Goal 15, the Multnomah County Comprehensive Plan includes Policy 15 Willamette River Greenway that establishes protections for land within the designated Greenway. Those protections include a Willamette River Greenway overlay zone in the zoning code that is applied to all lands within the designated Greenway. The overlay establishes development and design standards, and an administrative review procedure for development proposed within the overlay. Generally, the provisions related to the Willamette River Greenway apply to areas on Sauvie Island that front on the Willamette River. The Greenway Overlay Zone should be reviewed to ensure consistency with Goal 15 and any proposed acquisition areas identified by the County also should be referenced in the Comprehensive Plan.

ORS 215 COUNTY PLANNING, ZONING, HOUSING CODES

WINERIES: ORS 215 contains relatively new (2012) language regarding commercial wineries on EFU lands. The policy language in the Comprehensive Plan does not currently address wineries. The draft Sauvie Island RAP includes a brief discussion that references the ORS language and states that there are currently no commercial wineries on the island. The other RAPs are silent on the issue of wineries.

Recommendation: Comprehensive Plan Policies 9 and 10 related to agricultural lands could be updated to reference ORS allowances and limitations for wineries. The results of the multi-county model ordinance work referenced under Statewide Goals 3 and 4 also may provide guidance to help update this aspect of the Comprehensive Plan.

OAR 660-033 AGRICULTURAL LAND

This rule establishes requirements for identifying agricultural lands and implements sections of ORS 215. It also establishes minimum parcel size requirements; uses that can be permitted outright or conditionally on designated agricultural lands and associated standards; and limitations on dwellings in conjunction with a farm use. As noted previously, DLCD and APG are working on a model ordinance that Counties will be able to use to ensure consistency with these provisions. Results of that effort will be used to ensure consistency of the Comprehensive Plan and Development Code with these requirements.

METRO PLANNING REQUIREMENTS & POLICIES

METRO REGIONAL FRAMEWORK PLAN: The Framework Plan provides more detailed policy guidance for the 2040 Growth Concept and contains policies for land use, transportation, hazards, water quality and other regional elements. Much of the policy language focuses on those areas within the Urban Growth Boundary (UGB). However, there are recommendations and requirements for local governments that should be considered as part of this Comprehensive Plan update, including policies and requirements for urban and rural reserve planning and protection of agricultural and forest land in those areas that apply to lands outside the UGB and within the rural portions of the County. These include portions of Sauvie Island, the West Hills and the area west of the Sandy River, as well as a small portion land east of the Sandy River.

Recommendation: Consider policy language as needed to ensure coordination with Metro on those policy areas that overlap (policies that apply outside the UGB). Specifically, review Framework Plan policies related to watershed management, natural hazards, urban and rural reserve planning and other requirements, as applicable.

METRO PARKS AND NATURAL AREAS: Metro is in the process of drafting a parks system plan (anticipated completion in December 2015).

Recommendation: It appears that Comprehensive Plan policy language related to parks (Policies 39 and 40) may need to be updated to reflect the Metro parks that are located within unincorporated areas of the county. Language in this section could also be revised to emphasize coordination with Metro in parks planning.

In addition, the West of Sandy, East of Sandy and West Hills RAPs all contain outdated information about parks and reference outdated documents (1997 Oxbow Park Master Plan, 1992 Metro Greenspaces Master Plan, for example). Parks information (and any associated maps) for these areas should be updated to reflect more recent regional park planning efforts and parks that have been created since the RAPs were last updated.

CLIMATE SMART COMMUNITIES SCENARIOS PROJECT: This project responds to a state mandate to reduce greenhouse gas emissions by 2035. Still in draft form, the Draft Toolbox of Possible Actions (Sept. 2014) contains potential actions that can be taken by county governments to help achieve the mandated reductions.

Recommendation: The County could review the actions identified in the Toolbox and consider including new policy language in the Comprehensive Plan as appropriate to support and implement the project.

COUNTY PLANNING REQUIREMENTS & POLICIES

COLUMBIA RIVER GORGE NATIONAL SCENIC AREA: The Columbia River Gorge National Scenic Area Plan protects and provides for enhancement of the scenic, cultural, recreational, and natural resources of the Columbia River Gorge. Policy 41 of the Comprehensive Plan calls for the County to “implement the goals, objectives, policies, and guideline elements contained in

the *Management Plan for the Columbia River Gorge National Scenic Area* and attendant maps (including any future amendments) for that portion of the County designated by Congress as the Columbia River Gorge National Scenic Area." No changes or additions to this policy are recommended as part of this update.

MULTNOMAH FOOD ACTION PLAN: The Multnomah Food Action Plan is designed as a tool to help focus community's resources and efforts on community-established priorities so that our region plans and invests wisely in a sustainable food system.

Recommendation: Consider drafting a new section of policy language for the Comprehensive Plan to address the Food Action Plan goals to the extent they are related to other aspects of the Comprehensive Plan. There is some overlap with other policy sections in the Comprehensive Plan (protecting agricultural lands, social equity, and economy) – those overlapping areas should be consistent with any new food-related policies. This will be especially relevant to Sauvie Island due to the large amount of food grown and sold there.

MULTNOMAH COUNTY EQUITY AND EMPOWERMENT LENS: The Equity and Empowerment Lens is tool used to improve planning, decision-making, and resource allocation leading to more racially equitable policies and programs.

Recommendation: Consider adding new policy language to the Comprehensive Plan that specifically addresses equity in policy and decision making. The Policy and Decision-Making Questions include in the draft Equity and Empowerment Lens provide a framework for potential new policy language, if necessary and relevant to other elements of the Comprehensive Plan.

MULTNOMAH COUNTY HEALTH EQUITY INITIATIVE: This initiative establishes county-wide priority policies to address the root causes of socioeconomic and racial injustices that lead to health disparities.

Recommendation: Consider drafting new policy language for the Comprehensive Plan that addresses health equity. Specific policies could emphasize: access to food/farms, access to public transportation, affordable housing, and a land use review process that considers equity in decision-making. Again, there will be overlap with other policy sections in the Comprehensive Plan so consistency between them should be confirmed.

MULTNOMAH COUNTY NATURAL HAZARDS MITIGATION PLAN: This plan contains updated (2012) county goals for addressing, planning for, and mitigating natural hazards. The emphasis is on the unincorporated rural parts of the county and on Multnomah County government facilities and services. Chapter 4 contains goals and objectives related to coordinating with other government agencies.

Recommendation: Policy 14 Development Limitations already contains some language about zoning regulations intended to avoid or mitigate natural hazards. However, the County could also consider drafting a new strategy under Policy 4 Intergovernmental Coordination that specifies coordination with the County Office of Emergency Management. In addition, Policy 23 of the West Hills RAP recommends revising Comprehensive Plan Policy 14 to designate lands

with average slopes greater than 25% as having development limitations (current policy applies to lands with slopes greater than 20%). This revision will resolve an existing conflict between the Comprehensive Plan and the County Zoning Ordinance. Information in the Hazards Mitigation Plan also should be used address requirements associated with Statewide Goal 7.

MULTNOMAH COUNTY CLIMATE ACTION PLAN: The 2009 Climate Action Plan serves as the 40-year roadmap for the institutional and individual change needed to reduce community-wide greenhouse gas emissions 80% by 2050. The 2014 Climate Change Preparation Strategy identifies Department of Community Services (DCS) as the lead agency on a number of strategy objectives.

Recommendation: Consider drafting some climate change and sustainability policy language for the Comprehensive Plan that addresses applicable objectives in the Action Plan, particularly those related to buildings and energy (Objective 1), urban form and mobility (Objective 2), and local government operations (Objective 8). Also, update Comprehensive Plan policies as needed to reflect the strategies where DCS is identified as the lead agency.

MULTNOMAH COUNTY BOARD LAND USE PLANNING VALUES: These are general value statements adopted by the Board and reaffirmed in 2007. Policy language in the Comprehensive Plan and RAPs generally supports and is consistent with these values. No updates are recommended.

TRANSPORTATION FACILITIES AND PLANS

This section of the report describes Multnomah County plans, state and local plans, Metro plans, and service provider plans that contain plans, policies, or projects that are relevant to the County's Comprehensive Plan Update and related Transportation System Plan Update for the rural unincorporated areas of Multnomah County.

This report identifies the relevant reference background documents, their date and on-line location, and provides a brief summary and description of each document's relevance to the Multnomah County Comprehensive Plan Update. More detailed information can be found in a separate memorandum on this topic.

It should be noted that the County has several documents pertinent to project implementation including the Multnomah County Road Rules and the Design and Construction Manual; however, these types of documents are not included below. The plan and policy documents relevant to Multnomah County rural area transportation include:

- Multnomah County Documents
    - Comprehensive Framework Plan [Policies 33 – 36]
    - Rural Area Plans
        - Columbia River Gorge NSA Rural Area Plan Policy Document (2005)
            - Columbia River Gorge National Scenic Area Management Plan (2011)
        - East of Sandy River Rural Area Plan (1997) [Transportation Section]
        - West of Sandy River Rural Area Plan (2005) [Transportation Section]
        - West Hills Rural Area Plan (1996) [Transportation Section]
        - Sauvie Island/Multnomah Channel Rural Area Plan (1997) [Transportation Section]
    - Transportation System Plans
        - Westside Rural Area Transportation System Plan (1998)
        - Functional Classification of Trafficways Findings and Recommendations Technical Report (2003)
        - Pedestrian Master Plan (1996)
        - Bicycle Master Plan (1990)
    - Transportation Capital Improvement Plan and Program Fiscal Years 2014-2018 (2014)

- Adjacent Jurisdiction Documents[12]
    - Washington County Draft 2035 Transportation System Plan (2014)

[12] TSPs for the Cities of Fairview and Troutdale will be considered; Troutdale's southeastern city limits border the West of Sandy rural area and its County roads.

- Clackamas County Transportation System Plan (2013)
- Hood River County Transportation System Plan (2011)
- Columbia County Long Range Transportation Plan (2004)
- City of Gresham Transportation System Plan (2013)
- City of Troutdale Transportation System Plan (2014)
- Portland Transportation System Plan (2007)
- Multnomah County Urban Pockets Transportation System Plan (2006)

- Metro Documents
  - Metro Regional Transportation Plan (2014)
  - East Metro Connections Plan (June 2012)
  - Metro Regional Framework Plan (January 2011)

- State Documents
  - Oregon Highway Plan (1999 w/ revisions through 2013)
  - Oregon Rail Plan (2014)
  - Oregon Freight Plan (2011)
  - Oregon Transportation Options Plan (On-going)I-84 Corridor Strategy Guidelines (2005)
  - Cornelius Pass Road Safety Evaluation Jobs and Transportation Act (2009)
  - ODOT Statewide Transportation Improvement Program (June 2012)

- Transit Service Provider Plans
  - Trimet- Eastside Service Enhancement Plan (On-going)
  - Trimet - North/Central Service Enhancement Plan (TBD)
  - Columbia County Community-wide Transit Plan and Highwy 30 Transit Access Plan (2009)
  - Sandy Transit Master Plan (2009)

MULTNOMAH COUNTY DOCUMENTS

COMPREHENSIVE FRAMEWORK PLAN

https://multco.us/file/18449/download

This document outlines the county's land use mission statement. It describes the policies that guide decisions made by the Land Use Planning Division as well as the relationship between Multnomah County land use decisions and the policies adopted by the Metro Council and statewide planning agencies. Polices 33a, 33c, 34, 35, 36 specifically deal with the surface transportation system.

Relevance to the Comprehensive Plan/TSP Update: The following policies affecting the transportation system within unincorporated areas will be reviewed with the County to identify gaps in policy and help identify potential subject areas for new policies:

- Policy 33A: Transportation System
- Policy 33C: Bikeways/Pedestrian System
- Policy 34: Traffic Ways
- Policy 35: Public Transportation
- Policy 36: Transportation System Development Requirements

These policies need be considered along with the area specific policies identified in the individual Rural Area Plans and other documents reviewed.

COLUMBIA RIVER GORGE NSA RURAL AREA PLAN POLICY DOCUMENT (JUNE 2005)

https://multco.us/file/27510/download

This Rural Area Plan Policy Document provides guidance on decision making regarding land use, capital improvements, and physical development of the Multnomah County portion of the Columbia River Gorge National Scenic Area.

Relevance to the Comprehensive Plan/TSP Update: The policy document has one reference related to transportation (page 12) that is a policy regarding off-street parking and loading that states the County shall enact standards to reduce traffic congestion and maintain proper function of streets through regulations and standards for parking and loading for specific land uses in the Scenic Area.

COLUMBIA RIVER GORGE NATIONAL SCENIC AREA MANAGEMENT PLAN (SEPTEMBER 2011)

http://www.gorgecommission.org/managementplan.cfm;jsessionid=c430591ff9952ee556d9246e6e2e2516737c?CFID=110929083&CFTOKEN=2ce7fbe763402d39-FAF6C9F6-0B36-5370-DA1045F214E58863&jsessionid=c430591ff9952ee556d9246e6e2e2516737c

This plan was developed to ensure the Columbia River Gorge National Scenic Area is used in ways consistent with the Scenic Area Act. The Management Plan identifies goals, objectives, policies and guidelines for resource protection and enhancement, addresses land use designations, outlines an action program, and focuses on roles of the invested parties. Part 1, Chapter 4 (Recreation Resources) and Part 3, Chapter 3 (Enhancement Strategies) both include goals, objectives, and policies related to transportation that primarily focus on enhancing multi-modal access to the NSA.

Relevance to the Comprehensive Plan/TSP Update: Part 1, Chapter 4 (Recreation Resources) includes goals, objectives, and policies related to “Trails and Pathways” as well as “Transportation” in the NSA. The trails and pathways policies relate to creating connections to

the metro area from the NSA as well as between the various recreational sites in addition to creating new recreational opportunities. The transportation policies are related to promoting alternative modes of travel and specifically ensuring that recreational sites can accommodate transit vehicles.

Part 3, Chapter 3 (Enhancement Strategies) includes transportation related strategies for enhancing recreational resources. These include increasing transportation options and promoting modes that are recreational in nature.

EAST OF SANDY RIVER RURAL AREA PLAN (JULY 1997)

https://multco.us/file/27455/download

A part of the Rural Area Planning Program and the overall Multnomah County Comprehensive Framework Plan, this plan provides guidance on decision making regarding land use, capital improvements, and physical development of the East of Sandy River Area. It includes a brief "Transportation" section.

Relevance to the Comprehensive Plan/TSP Update: The East of Sandy River Rural Area is an unincorporated area of Multnomah County and therefore any policies and projects for this area should be reviewed, updated, and consolidated into the Multnomah County TSP Update.

The East of Sandy River Rural Area Plan includes five transportation related policies (Policy 36 – 41) in the Transportation section that need to be considered in a policy gap analysis and to identify policies that are unique to this area.

The Transportation section of the Plan identifies functional classifications for the ODOT (I-84) and County roadways within the plan area and includes areas that are also within the Historic Columbia River Gorge National Scenic Area (NSA) and included in the NSA Overlay.

The Plan identifies roadways that were designated as part of the County's Bikeways Plan Map in 1992 and also summarizes recommendations to modify that map from the Northeast Multnomah County Community Association. Those recommendations largely include postponing implementation of the Bikeways Plan until there is more community support, removing some segment designations, and to consider the needs of equestrians and other forms of active transportation.

The Plan acknowledges that there are no County plans or policies that establish or designate equestrian trails in the County and that equestrians use the public right-of-way like other non-motorized users; however, improvements such as paving shoulders hamper equestrian use. The Plan suggests the County could encourage a private system for equestrian use through land use approvals and approval of signage on the roadway system.

WEST OF SANDY RIVER RURAL AREA PLAN (DECEMBER 2002)

https://multco.us/file/27459/download

A part of the Rural Area Planning Program and the overall Multnomah County Comprehensive Framework Plan, this plan is intended to guide development in the West of Sandy River area over the next 20 years. It includes a transportation chapter that is titled the "Transportation System Plan" for the area.

Relevance to the Comprehensive Plan/TSP Update: West of Sandy River Rural Area is an unincorporated area of Multnomah County and therefore any policies and projects for this area should be reviewed, updated, and consolidated into the Multnomah County TSP Update.

The West of Sandy River Rural Area Plan includes eleven transportation related policies (Policy 27 – 37) in the Transportation System Plan section that need to be considered in a policy gap analysis and to identify policies that are unique to this area.

The Existing Conditions section of the TSP section identifies functional classifications for the ODOT (US 26) and County roadways within the West of Sandy River Rural Area along with roadway inventory data including pavement width, pavement conditions, bridge/viaduct conditions, crash rates, speed zones, truck restrictions, traffic volumes, and intersection operations and overviews of other modes including the pedestrian and bicycle systems, public transportation, and air, rail, water, and pipeline systems.

The TSP then projects future conditions for the roadway system through the projection of future traffic volumes and describes potential future needs for other modes.

The recommendations within the TSP include several functional classification changes, intersection LOS standards changes in the Orient Rural Center, and a review of truck route signage and restrictions. Several intersection improvements are recommended to improve safety and the Stark Street viaduct is recommended to be replaced.

The TSP Appendix includes a proposed bikeways and walkways network map that identifies routes for improvements. It is based largely on roadways with ADTs above 3,000 and those heavily traveled by cyclists to access Oxbow Park.

The TSP identifies the potential future need for a small park-and-ride in the rural area center.

These projects and recommendations should be reviewed, updated, and consolidated into the Multnomah County TSP Update.

WEST HILLS RURAL AREA PLAN (OCTOBER 1996)

https://multco.us/file/27453/download

The first of the rural plans to be completed by the Rural Area Planning Program, the West Hills Rural Area Plan provides guidance on decision making regarding land use, capital improvements, and physical development of the West Hills area. The plan is a part of the larger Multnomah County Comprehensive Framework Plan. It includes a brief "Transportation" section; however, the "Westside Rural Multnomah County Transportation System Plan" (TSP) was

adopted after the West Hills Rural Area Plan but is consistent with the policies in the Rural Area Plan.

Relevance to the Comprehensive Plan/TSP Update: West Hills is an unincorporated area of Multnomah County and therefore any policies and projects for this area should be reviewed, updated, and consolidated into the Multnomah County TSP Update.

The Rural Area Plan section on Transportation includes functional classifications of roadways, references the County's Bicycle Master Plan routes within the area, and discusses a potential Burlington Northern rails-to-trails project along Cornelius Pass Road. The Plan includes several transportation related policies (Policy 8 – 10). Policy 8 opposes the construction of regional roadways in the West Hills Rural Area (such as a regional by-pass). These policies need to be considered in a policy gap analysis and to identify policies that are unique to this area.

The plan also includes a section on Recreational Trails that refers to two significant regional recreational efforts; one utilizing a Burlington Northern right-of-way that is planned to be vacated (referenced above), and the "Greenway to the Pacific" which has two potential corridors that could impact the West Hills Rural Area. Much has occurred related to regional trail planning since 1996 and the Comprehensive Plan and TSP need to reflect the latest local, regional, and state plans for recreational trails in the area. Policies 16 and 17 in the Rural Area Plan relate to regional trails and should be included in the policy gap analysis and review.

SAUVIE ISLAND/MULTNOMAH CHANNEL RURAL AREA PLAN (OCTOBER 1997; 2014 UPDATE IN PROCESS)

https://multco.us/file/27454/download

This plan is a part of the Rural Area Planning Program and Multnomah County Comprehensive Framework Plan and provides guidance on decision making regarding land use, capital improvements, and physical development of the Sauvie Island/Multnomah Channel area. It is in the process of being updated but the current update has not yet addressed transportation policies and plans. However, this work is scheduled to be conducted as part of a separate planning process to be undertaken concurrently with the TSP process.

Relevance to the Comprehensive Plan/TSP Update: Sauvie Island/Multnomah Channel is an unincorporated area of Multnomah County and therefore any plans and policies for this area should be reviewed, updated, and consolidated into the Multnomah County TSP Update.

The Rural Area Plan section on Transportation includes functional classifications of roadways and references the County's Bicycle Master Plan routes within the area; namely US 30 and Sauvie Island Road. The Plan also highlights the lack of shoulders on Sauvie Island and the inconsistency with the County's Pedestrian Master Plan.

The Plan includes six transportation related policies (Policy 21 – 26) that need to be considered in a policy gap analysis and to identify policies that are unique to this area. The policies largely relate to the need for a Bicycle and Pedestrian Advisory Committee for the area and opposition

to regional roadway facilities in the area (such as a by-pass). Most of the information in this document is expected to be updated as part of the planning process described above.

WESTSIDE RURAL MULTNOMAH COUNTY TRANSPORTATION SYSTEM PLAN (JULY 1998)

https://multco.us/file/28612/download

The Westside Rural Multnomah County TSP covers both the West Hills and Sauvie Island/Multnomah Channel Rural Area Plan areas. This Plan is being updated as part of the process noted in the Sauvie Island Rural Area Plan description listed previously.

Relevance to the Comprehensive Plan/TSP Update: The areas covered by this TSP are unincorporated areas of Multnomah County and therefore any policies and projects for these areas should be reviewed, updated, and consolidated into the Multnomah County TSP Update.

The TSP includes approximately 15 policies falling under five goal areas and are largely related to safety for all modes of travel, the provision and support of transportation options (such as ride-sharing and active transportation facilities), maintaining the proper function of local roadways, and freight movement.

The Existing Conditions section of the TSP section identifies natural hazards and functional classifications for the ODOT (US 30) and County roadways within the plan area along with roadway inventory data including pavement width, pavement conditions, bridge/viaduct conditions, slope stability, and access management. It includes roadway design standards and also includes traffic volumes, intersection operations and overviews of other modes including the pedestrian and bicycle systems, public transportation, and air, rail, water, and pipeline systems. It then includes a safety review and documents roadways where area residents have speed concerns.

The TSP then projects future conditions for the roadway system using both Metro model data and historic traffic volumes to project future traffic volumes and includes a review of the adequacy of the existing functional classifications and looks at future intersection operations.

The recommendations within the TSP include study and improvements to Cornelius Pass Road, several intersection improvements along Highway 30, study of the Sauvie Island Bridge needs, monitoring the need to upgrade Newberry Road to a collector while also trying to preserve it as a local street.

The plan identifies the need for formalizing an informal park-and-ride facility on Sauvie Island and providing a park-and-ride for regional commuters on US 30 near the Columbia County line.

The plan indicates that apart from US 30, none of the roadways identified in the Bicycle Master Plan or Pedestrian Master Plan have paved shoulders and that the primary use of these facilities for walking and biking is recreational. Several roadways are identified as priorities in both the West Hills and Sauvie Island area.

The plan includes a list of twenty-one improvements and potential funding opportunities for them. They primarily include roadway and intersection safety improvements, shoulder widening, and recommended locations for ride-share and vanpool parking. These projects and recommendations should be reviewed, updated, and consolidated into the Multnomah County TSP Update.

Much of the information in this document is expected to be updated as part of the planning process described above.

MULTNOMAH COUNTY FUNCTIONAL CLASSIFICATION OF TRAFFICWAYS FINDINGS AND RECOMMENDATIONS TECHNICAL REPORT (OCTOBER 2003)

https://multco.us/file/28613/download

The report reviews, evaluates, and makes recommendations for updates and changes to the functional classification of roadways in Multnomah County including roadways in both urban and unincorporated areas.

Relevance to the Comprehensive Plan/TSP Update: This document includes recommended roadway functional classifications for both urban and rural area roadways and is more current than any of the County's Rural Area Plans and TSPs. Although largely focused on consistency with Metro and local agency plans in urban areas, it does include information on designated Scenic Routes, recommended updates to the Comprehensive Framework Plan Policies to provide compliance with the Transportation Planning Rule, discusses truck routes and identifies areas of truck restrictions and bridge weight restrictions. These recommendations should be reviewed, updated, and consolidated into the Multnomah County TSP Update.

MULTNOMAH COUNTY PEDESTRIAN MASTER PLAN (APRIL 1996)

https://multco.us/file/28614/download

This plan provides a framework for developing a safe and convenient pedestrian system on both urban and rural roads. It includes a vision for walking in Multnomah County and includes objectives and policies that were recommended for adoption into the Comprehensive Framework Plan. The plan also contains an inventory of existing pedestrian facilities, deficiencies in the system, as well as a Pedestrian Capital Improvement Program (PCIP). The PCIP developed criteria for prioritizing pedestrian projects and identified funding sources for implementation.

Relevance to the Comprehensive Plan/TSP Update: This plan includes pedestrian related policies and improvement priorities. These recommendations should be reviewed, updated, and consolidated into the Multnomah County TSP Update.

MULTNOMAH COUNTY BICYCLE MASTER PLAN (DECEMBER 1990)

https://multco.us/file/23733/download

The Multnomah County Bicycle Master Plan outlines development of a safe and efficient road and bicycle system. The plan amends the Comprehensive Framework Plan Bicycle Map to update the bicycle routes. It includes guidance on appropriate facility types (shared lanes or shoulder bikeways in the rural area) by roadway functional classification and characteristics. It also includes objectives and policies and a Bicycle Capital Improvement Plan (BCIP) as a means to implement the Plan.

Relevance to the Comprehensive Plan/TSP Update: This plan includes bicycle related policies, facility type guidance, and future network map. These recommendations should be reviewed, updated, and consolidated into the Multnomah County TSP Update.

MULTNOMAH COUNTY TRANSPORTATION CAPITAL IMPROVEMENT PLAN AND PROGRAM FISCAL YEARS 2014-2018 (MAY 2014)

https://multco.us/file/9289/download

This document establishes a list of priority transportation improvements to enhance and maintain the County's transportation system. Funding information including sources and amounts is also included.

Relevance to the Comprehensive Plan/TSP Update: Projects and programs on the CIP should be reviewed to determine if they are still warranted, if additions need to be made, and to update priorities.

ADJACENT JURISDICTION DOCUMENTS

WASHINGTON COUNTY 2035 TRANSPORTATION PLAN (2014)

http://www.co.washington.or.us/LUT/Divisions/LongRangePlanning/PlanningPrograms/TransportationPlanning/Transportation2035/

This document is the long-range transportation plan for Washington County. The plan identified existing and future needs as well as projects and funding to address the identified needs. The plan addresses the major roadway system, transit, pedestrian, and bicycle transportation issues and focuses on specific and system requirements.

Relevance to the Comprehensive Plan/TSP Update: This plan addresses the neighboring unincorporated areas to the west of the Multnomah County. Roadway functional classifications, regional trails, and planned projects effecting roadways to and from Multnomah County's Rural Westside TSP area should to be identified and reviewed.

CLACKAMAS COUNTY TRANSPORTATION SYSTEM PLAN (MARCH 2014)

http://www.clackamas.us/planning/documents/compplan/Chapter%205%20Transportation.pdf

(policies)

http://www.clackamas.us/planning/comprehensive.html

(maps and tables)

The Clackamas County Transportation System Plan is the long-range transportation plan for Clackamas County. The plan evaluates existing and long term transportation facilities for deficiencies and opportunities for improvements. It includes projects identified as 20-Year Capital Projects (projects likely to be funded in a 20-year timeframe), Preferred Capital Projects (priority projects that would be funded if additional funding were available), and Long-term Capital Projects (projects necessary to meet all future needs but that are not likely to be funded).

Relevance to the Comprehensive Plan/TSP Update: This plan addresses the county to the south adjacent to unincorporated areas of the Multnomah County. Roadway functional classifications, regional trails, and planned projects effecting roadways to and from Multnomah County's West and East of Sandy River Areas should to be identified and reviewed.

HOOD RIVER COUNTY TRANSPORTATION SYSTEM PLAN (NOVEMBER 2011)

http://www.co.hood-river.or.us/vertical/sites/%7B4BB5BFDA-3709-449E-9B16-B62A0A0DD6E4%7D/uploads/Final_HRC_TSP_11-21-11.pdf

This plan evaluates the existing and future needs of the transportation system and serves as guidance for the design, implementation and management of transportation facilities in Hood River County.

Relevance to the Comprehensive Plan/TSP Update: This plan addresses the areas east of the East of Sandy River Area Plan area. Roadway functional classifications, regional trails, and planned projects effecting roadways to and from Multnomah County's rural areas should to be identified and reviewed.

COLUMBIA COUNTY LONG RANGE TRANSPORTATION PLAN (IN-PROCESS)

http://columbiacountytsp.org/

Columbia County is in the process of updating the Columbia County Transportation System Plan as a guide for the County to address transportation needs through the year 2035.

Relevance to the Comprehensive Plan/TSP Update: This plan addresses the county to the north of the West Hills and Sauvie Island/Multnomah Channel rural Areas of Multnomah County. Roadway functional classifications, regional trails, and planned projects effecting roadways to and from Multnomah County's West Hills and Sauvie Island areas should to be identified and reviewed.

CITY OF GRESHAM TRANSPORTATION SYTEM PLAN (DECEMBER 2013)

https://greshamoregon.gov/tsp/

The City of Gresham's Transportation System Plan documents the existing and future transportation system within Gresham. It has four primary elements: guiding tenets, system of street function and design, project list, and funding mechanisms. This document is used to guide improvements to the transportation system in Gresham over the next 20 years.

Relevance to the Comprehensive Plan/TSP Update: This plan addresses the incorporated area west of Multnomah County's West of Sandy River Planning Area. Roadway functional classifications, regional trails, and planned projects effecting roadways to and from Multnomah County's West and East of Sandy River Areas should to be identified and reviewed.

CITY OF TROUTDALE TRANSPORTATION SYSTEM PLAN (MARCH 2014)

http://www.ci.troutdale.or.us//publicworks/documents/InfrastrucureMasterPlans/Final_tsp_03-04-2014.pdf

The transportation system plan for the City of Troutdale evaluated the existing multi-modal transportation system within Troutdale as well as the system in 20 years. Issues were identified and projects were developed to address the transportation issues. The plan is used as a guide for future transportation investments within Troutdale and is consistent with the East Metro Connections Plan.

Relevance to the Comprehensive Plan/TSP Update: This plan addresses the incorporated areas just west of Multnomah County's West and East of Sandy River Rural Areas. Roadway functional classifications, regional trails, and planned projects effecting roadways to and from Multnomah County's rural areas should to be identified and reviewed.

PORTLAND TRANSPORTATION SYSTEM PLAN (MAY 2007)

https://www.portlandoregon.gov/transportation/52495

This document is the long-range transportation plan for the city of Portland. The plan identified existing and future needs as well as projects and funding to address the identified needs.

Relevance to the Comprehensive Plan/TSP Update: This plan addresses the incorporated area southeast of the Westside Rural Area TSP. Roadway functional classifications, regional trails, and planned projects effecting roadways to and from Multnomah County's rural areas should to be identified and reviewed.

MULTNOMAH COUNTY URBAN POCKETS TSP (2006)

https://multco.us/file/28615/download

This document is the long-range transportation plan for unincorporated areas of Multnomah County within urban areas. The plan identified existing and future needs as well as projects and funding to address the identified needs.

Relevance to the Comprehensive Plan/TSP Update: This plan addresses unincorporated urban areas that are all currently within the planning areas of cities within Multnomah County. Roadway functional classifications, regional trails, and planned projects effecting roadways to and from Multnomah County's rural areas should to be identified and reviewed.

METRO DOCUMENTS

METRO REGIONAL TRANSPORTATION PLAN (JULY 2014)

http://www.oregonmetro.gov/regional-transportation-plan

Updated every four years, this document is Metro's guide for future investments for the region's transportation system. Existing and future transportation issues are evaluated to develop projects to help address the identified issues. All modes of travel are considered as well as an evaluation of costs and funding sources for projects.

Relevance to the Comprehensive Plan/TSP Update: This plan addresses the area adjacent to unincorporated areas of the Multnomah County. Roadway functional classifications, regional trails, and planned projects effecting roadways to and from Multnomah County's rural areas should to be identified and reviewed.

EAST METRO CONNECTIONS PLAN (JUNE 2012)

http://www.oregonmetro.gov/east-metro-connections-plan

The East Metro Connections Plan identifies transportation projects that advance economic and community development in the East Metro area by providing better access and mobility. Projects were developed with three focus areas in mind: north/south connections, downtowns and employment areas, and regional mobility. The study area includes the cities of Gresham, Fairview, Wood Village, and Troutdale, and the unincorporated Pleasant Valley, and Springwater areas.

Relevance to the Comprehensive Plan/TSP Update: This plan addresses both the incorporated and unincorporated portion of Multnomah County within the Metro urban growth boundary and generally lying south of I-84 and east of 181st Avenue. Roadway functional classifications, regional trails, future transit plans, and planned projects effecting roadways to and from Multnomah County's rural areas should to be identified and reviewed.

METRO REGIONAL FRAMEWORK PLAN (JANUARY 2011)

http://www.oregonmetro.gov/regional-framework-plan

The Metro Regional Framework Plan is based on the *2040 Growth Concept*, which provides a set of objectives for building better communities. While *2040 Growth Concept* provides objectives, the Regional Framework Plan goes a step further providing overall guidance for more detailed policies including regional transportation and mass transit systems.

Relevance to the Comprehensive Plan/TSP Update: This document provides guidance for regional transportation in the metro area, which is adjacent to unincorporated areas of Multnomah County. Policies and guidance addressing roadways into unincorporated areas should to be identified and reviewed.

STATE DOCUMENTS

OREGON HIGHWAY PLAN (1999)

http://www.oregon.gov/ODOT/TD/TP/pages/ohp.aspx

The Oregon Highway Plan outlines long-range policies and investments strategies for Oregon's multimodal transportation system. Guidance is given within this plan but responsibility for identifying specific projects is left to corridor plans and transportation system plans. The plan is a part of the Oregon's Statewide Transportation Plan.

Relevance to the Comprehensive Plan/TSP Update: This document provides policy for Oregon's State Highway System, many parts of which go through unincorporated areas of Multnomah County including Interstate-84, US 26, and US 30. Policies affecting these roadways through Multnomah County's unincorporated areas should to be identified and reviewed. These primarily include access spacing standards, vehicle mobility standards, and design standards.

OREGON STATE RAIL PLAN (SEPTEMBER 2014)

http://www.oregon.gov/ODOT/TD/TP/RailPlan/Adopted_Oregon_SRP.pdf

This plan is an element of the Oregon Transportation Plan and documents the freight and passenger rail system, provides a needs assessment, and includes an investment decision-making framework in addition to goals, policies and strategies for improving the rail system in Oregon. Rail is a critical component of the state's multimodal transportation network.

Relevance to the Comprehensive Plan/TSP Update: The freight and passenger rail system spreads across the state with many links within Multnomah County. Class 1 railroad exists along the Interstate-84 Corridor and Class 1 and Non-Class 1 railroads exist in the US 30 Corridor. In addition, there are some abandoned lines in Multnomah County. The existing railroad classifications and policy implications of those classifications for the railroads in unincorporated

areas should be identified and reviewed. In addition, the goals, policies and strategies in the plan should be reviewed to ensure County policies are consistent and updated as necessary.

OREGON FREIGHT PLAN (2011)

http://www.oregon.gov/odot/td/tp/pages/ofp.aspx

This plan is an element of the Oregon Transportation Plan. The purpose of the Oregon Freight Plan is to improve freight connections to local, state, tribal, regional, national and international markets with the goal of increasing trade-related jobs and income for Oregon workers and businesses. The plan documents the economic importance of freight movement in Oregon, identifies transportation networks important to freight-dependent industries and recommends multimodal strategies to increase strategic freight system efficiency. The plan identifies, sixteen freight issues and strategies with action steps to address the issues.

Relevance to the Comprehensive Plan/TSP Update: US 30, US 26, and Interstate-84 traverse the County's rural areas and play critical roles in the movement of freight in addition to providing access to the Port of Portland and the Port of St. Helens. This plan documents different types of commodity flows, policies, and strategies to enhance the movement of freight that could be relevant to the County TSP.

OREGON TRANSPORTATION OPTIONS PLAN (ON-GOING)

The Oregon Department of Transportation (ODOT) is developing Oregon's first Transportation Options Plan (TO Plan). The TO Plan is one of several statewide transportation mode and topic plans that further refine and implement the Oregon Transportation Plan's (OTP) goals, policies, strategies, and key initiatives.

The purpose of the Plan is to establish a vision and policy guidance that integrates transportation options in local, regional, and state transportation planning, programming, and investment. The TO Plan will be grounded in an examination of existing programs, investments, and unmet transportation needs in the state. The Plan will include policies and recommendations that support and advance TO program activities, suggest ways to integrate TO into transportation planning and investments, and support TO program activities and integration with capital investment planning at the local and regional level.

Relevance to the Comprehensive Plan/TSP Update: The assessment of existing programs, investments, and unmet transportation need should be reviewed as it relates to the Multnomah County rural areas and the applicable rural areas policies, strategies, and initiatives should be incorporated into the Travel Demand Management (TDM) elements of the TSP.

OREGON DEPARTMENT OF TRANSPORTATION – STATEWIDE TRANSPORTATION IMPROVEMENT PROGRAM (JUNE 2012)

ftp://ftp.odot.state.or.us/outgoing/STIP/OnlineSTIP_Public.pdf

The STIP is Oregon's capital improvement program which details transportation projects and programs, funding, and schedule across the state of Oregon. It includes projects on the federal, state, city, and county transportation systems.

Relevance to the Comprehensive Plan/TSP Update: Projects and programs effecting roadways to, from, and within Multnomah County's unincorporated areas should to be identified and reviewed.

SERVICE PROVIDER PLANS

TRIMET EASTSIDE SERVICE ENHANCEMENT PLAN (ON-GOING)

http://future.trimet.org/east

Through 2014 and early 2015, Trimet will be working on an Eastside Service Enhancement Plan to improve bus service, bus stops and street crossings in the communities of East Portland (generally east of I-205), Fairview, Gresham, Troutdale and Wood Village.

Relevance to the Comprehensive Plan/TSP Update: Trimet provides service near to the West of Sandy River Rural Area (Route 84) so potential service changes or opportunities to enhance service to this area should be monitored.

TRIMET NORTH/CENTRAL SERVICE ENHANCEMENT PLAN (TBD)

http://future.trimet.org/northcentral

In late 2014, Trimet will be initiating a North/Central Service Enhancement Plan to identify bus service, bus stops and street crossing improvements in Northwest Portland, North Portland, Downtown Portland, Southeast neighborhoods north of Division and extending east to I-205, and Northeast neighborhoods extending east to I-205. The plan will identify:

- near-term bus service improvements that can be made soon with modest cost
- long-term bus service improvements to implement over time
- partnerships with cities, the county and businesses to improve access to bus and light rail stops

Relevance to the Comprehensive Plan/TSP Update: Trimet provides service to Sauvie Island (Route 16) so potential service changes or enhancements to this area should be monitored and opportunities for improving transit should be explored in the Sauvie Island/Multnomah County TSP Update process.

COMMUNITY-WIDE TRANSIT PLAN AND HIGHWAY 30 TRANSIT ACCESS PLAN (2009)

http://www.ci.scappoose.or.us/vertical/sites/%7B057DE76A-C977-4C5C-A3EF-593B648863F4%7D/uploads/Columbia_County_Transit_Plan_-_Report.pdf

In 2009 Columbia County updated previous community-wide and coordinated transit service plans, drafted in 2002 and 2008 respectively. This update provides direction to the County for planning and implementing transit services, operations, facilities, and funding within a 10-year horizon. This plan also incorporates the US 30 Transit Access Plan for transit facility improvements along the US 30 transit corridor.

The Plan provides a set of recommendations for transit services throughout Columbia County. These include fixed routes bus, demand-response bus, vanpool, and carpool, supported by transit facilities, including upgraded bus stops and new park and ride lots. Additionally, the document addresses fares, current and future routes, and coordination with neighboring transit services.

Relevance to the Comprehensive Plan/TSP Update: Several of Columbia County Transit's routes travel along roadways within Multnomah County to get reach destinations including Portland and Hillsboro. Opportunities for coordination of services should be identified.

SANDY TRANSIT MASTER PLAN (2009)

http://www.ci.sandy.or.us/vertical/sites/%7B08758F4D-2A53-4D1D-B7C5-B13B658BB891%7D/uploads/%7B337CB89B-26AB-463F-A777-1E85DBC49314%7D.PDF

Relevance to the Comprehensive Plan/TSP Update: Several of Sandy Transit's routes travel along Highway 26 in the West of Sandy River Rural Area to reach destinations including Gresham and Estacada. Opportunities for coordination of services should be identified.

Appendix B Existing and Future Conditions Memo

KITTELSON & ASSOCIATES, INC.
TRANSPORTATION ENGINEERING / PLANNING
354 SW Upper Terrace Drive, Suite 101, Bend, Oregon 97702 P 541.312.8300 F 541.312.4585

TECHNICAL MEMORANDUM #2

Multnomah County Comprehensive Plan Update

Existing and Future Transportation Conditions

Date: June 9, 2015 Project #: 17944

To: Joanna Valencia, Multnomah County

From: Susan Wright, PE, and Jenny Miner

cc: Matt Hastie, Angelo Planning Group

Multnomah County is currently updating their Comprehensive Plan, including the transportation element for rural areas. Today, the Comprehensive Plan is supported by separate Transportation System Plans (TSPs) for the Rural Westside, and West of Sandy River areas (taking into account the West Hills, Sauvie Island, and West of Sandy River Area Plans) and, the transportation components of the East of Sandy River Area Plan and the Columbia River Gorge Scenic Area Management Plan. The updated Multnomah County TSP will incorporate relevant elements from all of these plans into one document.

This memorandum provides an inventory and assessment of existing and future conditions of the transportation system in the unincorporated rural areas of Multnomah County. This information can provide a baseline for the TSP update, and was assembled using Geographic Information System (GIS) files, data provided by Multnomah County, inventory conducted using Google Earth aerial images, field observations, and studies provided or produced by Multnomah County and the Oregon Department of Transportation (ODOT).

The information contained in this memorandum is organized into a series of sections, listed below.

The majority of the inventory and analysis results are presented in figures and tabular form with supplemental text provided, as needed, to further explain the illustrated information. The identified transportation needs contained herein are based on the County and ODOT's adopted performance measures. Based on information summarized in this memorandum, a series of policies, projects, programs, pilot projects and refinement studies will be identified to support the transportation system over the next twenty years.

EXISTING CONDITIONS

The following section describes the population, demographics, and land uses within the rural areas (herein referred to as the "study area"), and provides an overview of the existing inventory and conditions (if applicable) for all transportation modes and major elements of the transportation system.

STUDY AREA

The Transportation System Plan (TSP) focuses on the five rural areas of the county, including West Hills, Sauvie Island, West of Sandy River, East of Sandy River, and Columbia River Gorge National Scenic Area. The study area for the TSP is illustrated in Figures 1A and 1B.

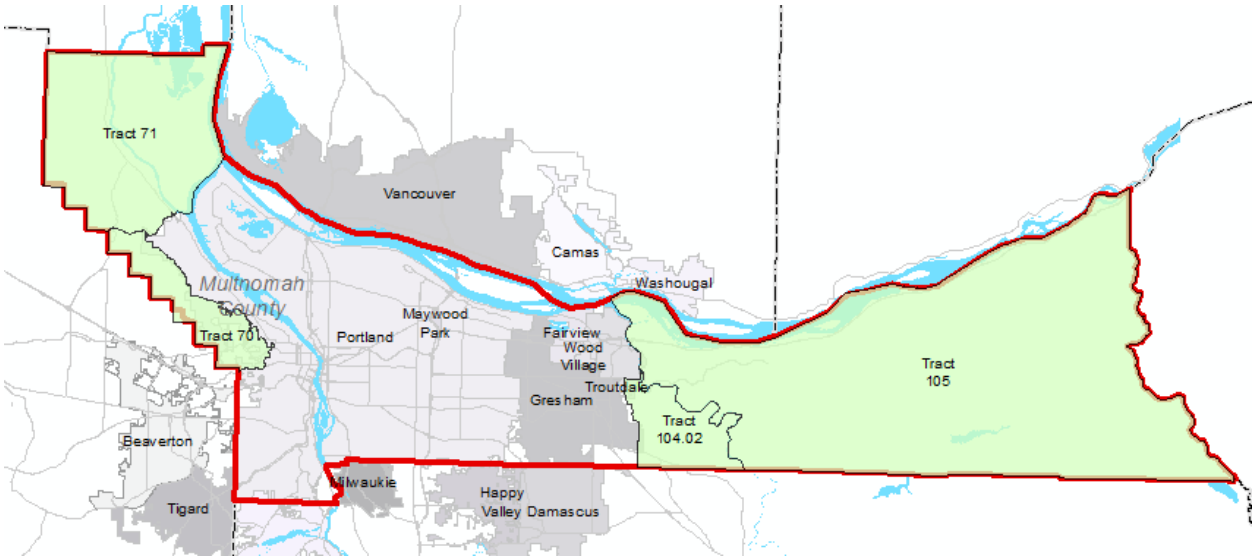
The Sauvie Island and Multnomah Channel (SIMC) TSP is being completed separately and in congruence with this TSP update. The SIMC area will still be included in this evaluation.

POPULATION AND DEMOGRAPHICS

Information about the rural area population and demographics was gathered to support the existing and future conditions analysis, particularly as the project team works with the community to develop future alternative scenarios that capture the County's vision. This data presented is based on the best available information that can be obtained from US Census, given that the Census Block boundaries don't perfectly align with the study areas and some information is not available. Given these

inconsistencies, this memo refers to the study areas as West Multnomah County and Eastern Multnomah County in some sections. West Multnomah County consists of Census Tracts 70 and 71 and the areas of Sauvie Island and West Hills. East Multnomah County consists of Census Tracts 104.02 and 105 and the areas of East of Sandy River and West of Sandy River. Exhibit 1 shows the study area census tracts.

Exhibit 1 Study Area Census Tracts (70, 71, 104.02, and 105)



For further information on land use and population, please see the "Population Demographics, Zoning, and Development" section of the Baseline Report memo prepared for the Comprehensive Plan Update by Angelo Planning Group dated December, 2014.

Population and Growth

Table 1 reports the population of Multnomah County and its sub-areas. Multnomah County's population in 2010 was just over 735,000 whereas the 2000 Census figure was 660,446. The county grew by 11.3%, or about 1.08% per year, from 2000 to 2010. This growth follows a similar trend to that experienced by the overall State of Oregon, which grew by 11.97%, or about 1.14% per year, during the same period.

Table 1 Year 2010 Area Populations

Area	2010 Census
Multnomah County	735,334
East of Sandy River	3,926
West of Sandy River	10,184
West Hills	10,052
Sauvie Island	888

Source: 2010 Census Block Group Data

Table 2 reports the population growth in the rural areas of the County. In comparison to the County as a whole, the rural areas grew at a higher rate from 2000 to 2010. While the growth in the rural areas do not represent a significant change in total population of the County as a whole, the rate of growth is relatively high for a rural area in Oregon, particularly compared to other rural parts of the state.

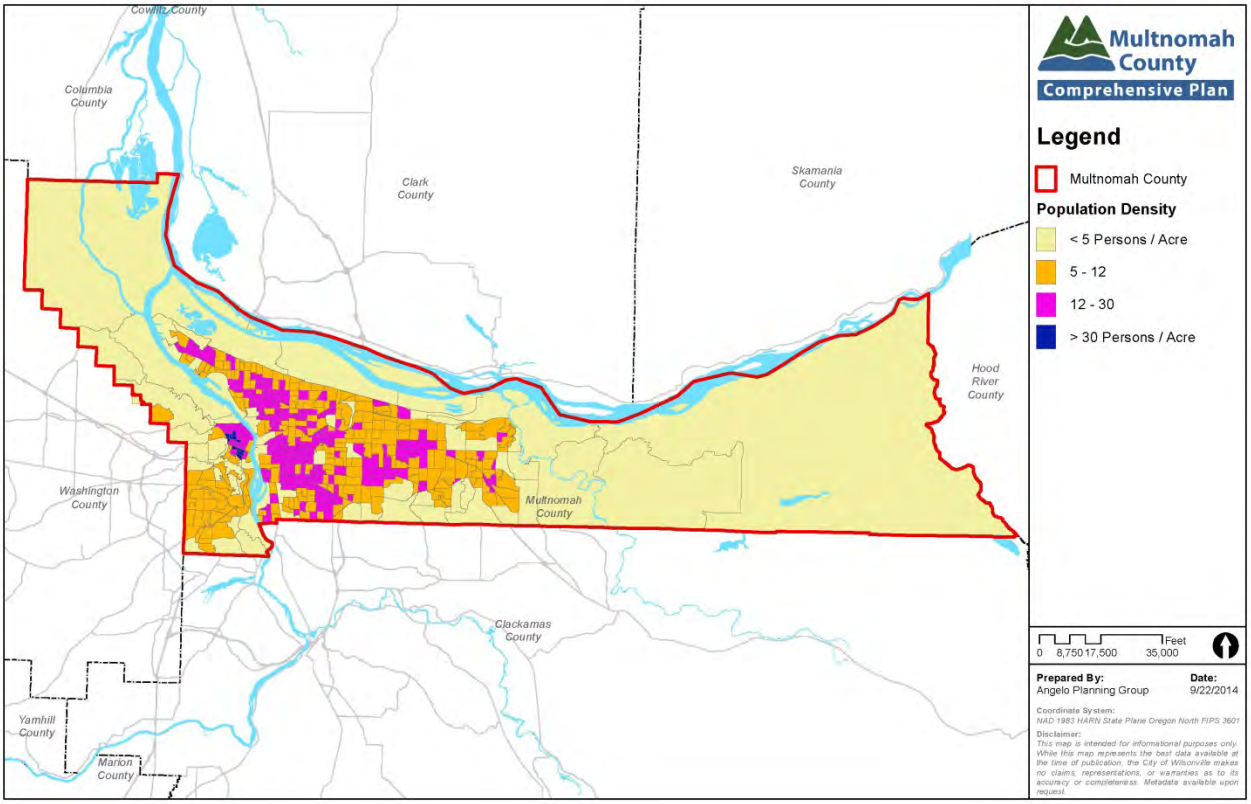
Table 2 Change in Population from 2000 to 2010 Census

Area	2000	2010	% Change	Average Annual Growth	Population Density***
Multnomah County	660,486	735,334	11.3%	1.08%	2.47 People/Acre
West Multnomah County*	7,963	10,940	37%	3.2%	0.25 People/Acre
East Multnomah County**	8,668	10,061	16%	1.5%	0.11 People/Acre
State of Oregon	3,421,399	3,831,074	11.9%	1.14%	--

*Includes Sauvie Island and West Hills subareas
**Includes East of Sandy River and West of Sandy River subareas
***Calculated as 2010 population / total acres within Census Block Groups
Source: 2000 and 2010 Census Tract Level Data

In addition to growth rates, Table 2 also reflects the 2010 estimates of people per acre within the County. This information is graphically represented in Exhibit 2 and Figures 2A and 2B by Census Block group.

Exhibit 2 Population Density Map



Family and Household Data

Table 3 reports the number and type of households by area. A family household is defined by the US Census Bureau as "a group of two or more people related by birth, marriage, or adoption and residing together." Approximately 53% of households meet this definition within Multnomah County. With the exception of Sauvie Island, which has about 57% family households, the rural areas of Multnomah County have higher than a 70% family household rate. The state as a whole has a family household rate of about 63%.

Multnomah County and the State of Oregon have similar median ages within the households with 35.7 and 38.4, respectively. The rural areas report a higher median age, in the range of 40 to 45, with the exception of Sauvie Island that has a median age of 50.

Table 3 Household Demographics

	East of Sandy River	West of Sandy River	West Hills	Sauvie Island	Multnomah County	State of Oregon
Number of Households	1,433 (100%)	3,573 (100%)	3,938 (100%)	410 (100%)	304,540 (100%)	1,518,938 (100%)
Family Households	1,063 (74.2%)	2831 (79.2%)	2,832 (71.9%)	233 (56.8%)	163,539 (53.7%)	963,467 (63.4%)
Nonfamily Households	370 (25.8%)	742 (20.8%)	1,106 (28.1%)	177 (43.2%)	141,001 (46.3%)	555,471 (36.6%)
Mean Household Size	2.65	2.85	2.56	2.14	2.35	2.47
Median Age	44.8	40.1	43.9	50	35.7	38.4

Economic Characteristics

Table 4 describes selected economic characteristics of the study area. The rural areas of the county have a higher median household income than the county as a whole. West County generally has a higher income, lower unemployment rate, and lower poverty rate than East County or Multnomah County as a whole, particularly Tract 70, which approximates the West Hills rural plan area. Due to the small sample size, however, margins of error are fairly high.

Table 4 Economic Characteristics

	West County		East County		Multnomah County
	Tract 70	Tract 71	Tract 104.2	Tract 105	--
Median Household Income	$148,832 (+/- $19,429)	$78,894 (+/-$14,306)	$76,630 (+/-$9,464)	$65,938 (+/-$10,090)	$51,582 (+/-$739)
Unemployed	7.4% (+/-2.8%)	6.1% +/-4.3%)	14.8% (+/-6.5%)	12.1% (+/-6.1%)	10.4% (+/-0.4%)
Individuals below poverty level in past 12 months	4.5% (+/-3.8%)	3.4% (+/-2.8%)	9.7% (+/-2.8%)	13.4% (+/-%7.3%)	17.1% (+/-0.6%)

LAND USE AND ZONING

This section describes the zoning designations, land use, parcel size, and vacancy status in each of the plan subareas. Figures 3A and 3B depict the zoning designations.

As shown, the majority of the rural areas of Multnomah County are zoned for agricultural and forest uses. Rural residential and single family residential make up most of the rest of the lands with little commercial and industrial development in the rural areas.

The East of Sandy River Rural Area is generally characterized by natural and commercial timber forests, much of which is within the Mt. Hood National Forest. The western-most portion of this Rural Area contains the most of the non-forest uses in the area, mainly consisting of agricultural, rural residential and rural service development.

The West of Sandy River Rural Area's predominant land uses in the plan area are nurseries, berry farms, and pastures, consistent with the agricultural zoning. The area is located in two major drainage basins, the Sandy River and the Willamette River via Johnson Creek. The area is open to urban influence to a greater degree than the other plan areas due to a lack of physical barriers, such as the steeper topography of West Hills, and the limited access to Sauvie Island and the East of Sandy River area.

Pleasant Valley and Interlachen are small unincorporated areas located due west of Columbia River Gorge National Scenic Area and West of Sandy River study areas, respectively. The Pleasant Valley subarea is under County zoning but lies within the urban growth boundary and is being planned by Gresham for eventual annexation into the City. The majority of the land in this area is currently zoned for rural residential use.

Interlachen is a small residential community located between Fairview Lake and Blue Lake and is surrounded by the City of Fairview. It is zoned entirely Urban Low Density Residential and largely built out.

The Columbia River Gorge National Scenic Area is zoned primarily for forest uses.

The West Hills Rural Area Plan is zoned for commercial forest use or exclusive farm use; lands zoned for rural residential use represents about a tenth of the total.

The Sauvie Island and Multnomah Channel Rural Area is zoned primarily for agricultural uses. Land Uses on the Island are predominantly farming-related (due to the fine soils on the island protected by the levees of the Sauvie Island Drainage District) as well as the wildlife refuge, various water-related uses on and along Multnomah Channel, ranging from protected wetlands to marinas, and recreational uses (due to proximity to the Portland Metropolitan Area). The rural area encompasses approximately 15,400 acres of land and several thousand additional acres of water. Approximately 11,800 of the 15,400 acres are designated in the Comprehensive Framework Plan as Exclusive Farm Use, with the remainder designated as Multiple Use Agriculture.

Key Destinations and Community Centers

Figures 4A and 4B show the key destinations and community centers in the rural areas that are likely origins and destinations for pedestrian, bicycle, and vehicle trips. As shown, many of the key destinations and community centers in the rural areas are schools. Others which are more likely to be accessed via vehicle include National Parks and public recreational areas. Sauvie Island has public beaches as well as farm lands that attract visitors with corn mazes, pumpkin patches, and fresh produce for sale. East County has a number of key destinations in National Forest, National Scenic Area and State parks including but not limited to recreation areas in the Mount Hood National Forest, Sandy River Delta Park, Multnomah Falls, Mt. Hood National Forest, and the Columbia River Gorge Scenic Area.

STREET SYSTEM AND TRAFFIC ANALYSIS

Primary roadway facilities, their characteristics, and existing operational performance are summarized below for each of the study areas.

Street System Overview

The following sections describe the key attributes of the roadways within the study area.

Roadway Jurisdiction

As shown in Figures 5A and 5B, the majority of the roads in the rural areas are under the County's or local jurisdiction. The state facilities within Multnomah County provide interstate, statewide, and regional connectivity. These facilities include Interstate 84 (I-84), Oregon Highway 30 (US 30), and a small section of Oregon Highway 26 (US 26). Highway 30 provides access to both the west and east sides of the county. I-84 serves the east area of the county.

Pavement Conditions

Figures 6A and B illustrate the pavement condition ratings for each of the roadways in the study area. The roadways are rated are based on a pavement conditions index from 0 and 100, with 100 representing the best possible condition and 0 representing the worst possible condition. The County's goal is to maintain pavement conditions at 70 or above but accepts 50 and above for rural roadways. As shown in the figures, the majority of the roadways in the study area are rated at 50 or above. The areas not meeting the standard of 50 or above are primarily located in the West of Sandy River area as well as the West Hills.

Functional Classification

Functional classification systems are used to establish a hierarchy of roadways based on their primary function (e.g., moving people across regions or providing access to local destinations). These

classification levels are identified by ODOT for state facilities, the County for County facilities, and local agencies for their own classification levels within their community. The classification levels also determine the recommended roadway cross-section for different facilities. The functional classification of roadways that Multnomah County established is based on the following hierarchy:

Minor Arterials represent the lowest order arterial facility in the regional street network. They typically carry less traffic volume then principal and major arterials, but have a high degree of connectivity between communities. Access management may be implemented to preserve traffic capacity. Land uses along the corridor are a mixture of community and regional activities. Minor arterial streets provide major links in the regional road and bikeway networks; provide for truck mobility and transit corridors; and are significant links in the local pedestrian system.[1]

Rural Arterials are the primary means of access into the County's large rural districts, and often connect between counties to accommodate through movements. Rural arterials connect to freeways or highways, and link rural collector and local roads to the urban area and other regions. Rural arterial roads carry greater traffic volumes then rural collector roads, including commuters and other home-based trips, natural resource trips involving trucks, and recreational trips involving autos, bicycles and equestrians.[1]

Major Collectors serve several purposes including linking neighborhoods to the regional system of bicycle and automobile streets, and basic transit services. They typically provide direct access between residential and commercial developments, schools and parks and carry higher volumes of traffic then neighborhood streets. Major collector streets area also utilized to access industrial and employment areas and other locations with large truck and over-sized load volumes.[1]

Neighborhood Collectors provide access primarily to residential land uses and link neighborhoods to higher order roads. They generally have higher traffic volumes than local streets.[1]

Local Urban and Rural provide access to abutting land uses on low traffic volume and low speed facilities. Their primary purpose is to serve local pedestrian, bicycle and automobile trips and limited public transportation use in urban areas; and auto and farm vehicle circulation with local pedestrian, bicycle and equestrian use in rural areas.[1]

Figures 7A and 7B depict the functional classifications of the roadways in the five rural study areas. As shown, the areas are mostly served by collectors and local roadways. Key arterials and state facilities that connect the rural areas to the regional system include I-84, Highway 30, Cornelius Pass Road, Orient Drive, Stark Street, Corbett Hill Road, and Troutdale Road.

[1] Multnomah County Functional Classification (Policy 34). https://multco.us/transportation-planning/multnomah-county-functional-classification-policy-34. Accessed May 2015.

Expectations about speed limits generally correspond with the functional classification of the roadway with higher classification (e.g. arterials) having greater speeds and lower classifications (e.g. locals) having lesser speeds. Figures 8A and 8B show the speed limits on roadways within the study area.

Roadway Cross-Section Standards

Expectations about roadway cross-sections are provided for each of the County's functional classifications. These cross-sections identify the required width for pedestrian facilities, bicycle facilities, landscaping/drainage, and number and width of vehicular travel lanes. The cross-section standards typically inform new roadways or roadway modification projects. Older roadways are typically upgraded to current standards when modified or reconstructed.

The County's current Design and Construction Manual[2] identifies rural roadway design standards. These standards are summarized below in Table 5.

As shown in the table, rural roadways in the County are not currently required to have bike lanes or marked bicycle facilities. The roadway design standards indicate that bicyclists shall be accommodated on the shoulder, when appropriate, based on the facility's traffic volumes. The Design and Construction Manual indicates that shoulders on collectors and arterials should be paved for a minimum of five feet. Rural roadways are also not required to have separate pedestrian facilities. Instead, rural roadway shoulders are typically used by pedestrians, bicycles, oversized vehicles, and for emergency pull-off purposes.

Table 5 Multnomah County Standards for Typical Rural Sections

Classification	Right-of-Way Width (ft)	Paved Width (ft)	Number of Lanes	Shoulder Width (ft)	Travel Lane Width (ft)
Arterial	60-90	20-55	2-4	6-8 (min. 5 ft. paved)	10-14
Collector	50-80	20-24	2	5-8 (5 ft. paved)	10-12
Local	50-60	20-24	2	5-6	10-12

Paved Width refers to the travel way and does not include shoulders

Figures 9A and 9B show the current width of roadways in the study area including both travel way and paved shoulders. As shown, most roads are 28 feet or less with many 23 feet or less. This indicates that many of the rural roadways have narrow or no paved shoulders.

[2] Multnomah County Design and Construction Manual. https://multco.us/file/16499/download.

Rural Intersections

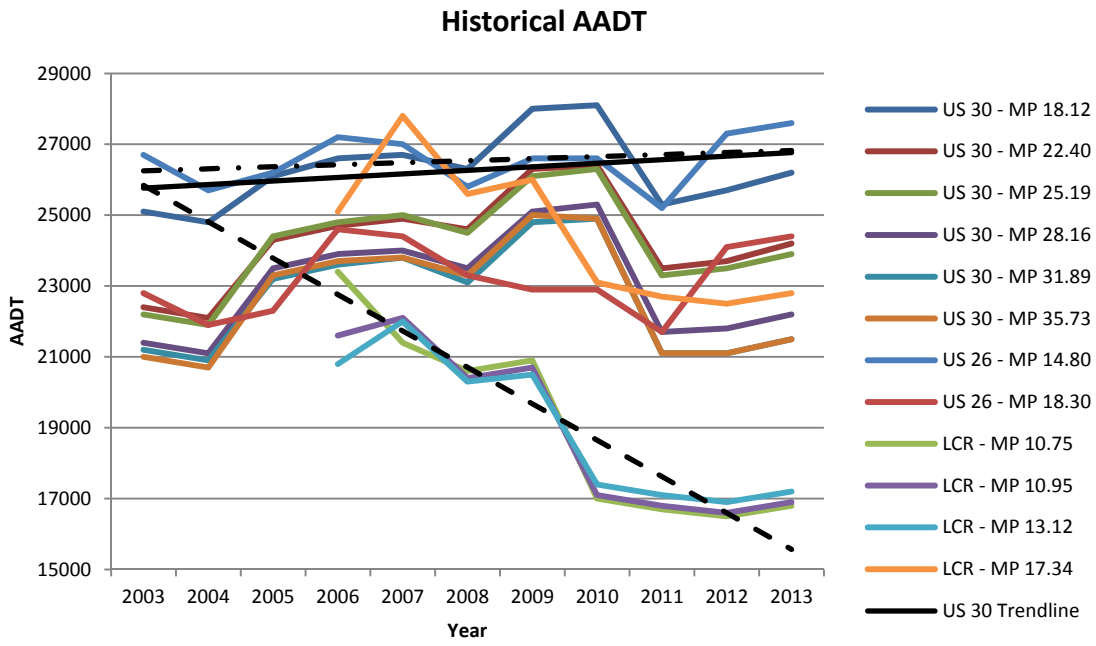
Figures 10A and 10B show the location of the all of the intersections within the study areas. Most of these locations are stop-controlled with the exception of two locations on the Westside. These include: Highway 30 and Sauvie Island Road, and Highway 30 and Cornelius Pass Road. Intersection operations and safety analyses will be conducted at key intersections serving the rural areas as part of the forthcoming Alternatives Analysis Memo.

Traffic Volumes

Average annual daily traffic on roadway segments throughout the study area are shown in Figures 11A and 11B. As shown, the majority of the roadways carry less than 1,000 vehicles per day on average. As expected, the arterial roadways, such as Cornelius Pass Road, SE Foster Road and Troutdale Road carry higher volumes of traffic.

From the Sauvie Island and Multnomah Channel TSP update, average daily traffic volumes on most of the roadways throughout Sauvie Island are less than 3,000 vehicles per day serving residents and daily business operations. The popularity of the beaches, hunting and fishing areas, recreational cycling opportunities, seasonal festivals, and agri-tourism activities lead to significant fluctuations in average daily traffic volumes during the peak seasons, summer and fall. During these times, the Sauvie Island Road can have as many as 17,000 vehicles per day. The peak traffic conditions are a result of both seasonal all-day events (such as access to public beaches and pumpkin patches) as well as limited duration events (such as concerts and farm-to-table dinners).

ODOT records annual average daily traffic (AADT) volumes on all state highways. depicts the historical AADTs, as well as trendlines, for the state facilities in the study area. Table 7 provides a summary of historical AADTs for the state facilities in the study area. As shown in Exhibit 3, traffic volumes generally followed the overall state trends related to decreases during the recession and an increase since 2011. Volumes on the Lower Columbia River (US 30) have gone down since 2006 and is reflected in the trendline. Overall growth between 2003 and 2013 has averaged to less than one percent per year on US 26 and US 30 in East County. Volumes on US 30 (Lower Columbia River Highway) in West County are still at levels lower than recorded in 2007. Appendix 3 provides a table with more details on the historical AADT.



LCR – Lower Columbia River (US 30); No counts were recorded on LCR for 2003, 2004, and 2005

Exhibit 3 Historical AADT on State Highways in Rural Multnomah County

HISTORIC CRASH ANALYSIS

Crash data from the latest five years (January 1, 2009 through December 31, 2013) was obtained from ODOT for all State and County roadways within the study areas.

County Crash Patterns

A total of 1,403 crashes were reported in in the study areas between 2009 and 2013. Of the 1,403 crashes, 401 were reported on I-84. Table 6 summarizes the reported crashes by severity. Half of the reported crashes involved an injury, and 24 crashes involved a fatality. Of the fatal crashes, 14 were reported as a fixed object crash. The second most common crash type reported for fatalities was head-on collisions. One fatality was the result of a collision between a pedestrian and motor vehicle. This crash occurred under dark light and wet road conditions. The report states the pedestrian was in the roadway illegally and wearing non-visible clothing. The majority of the fatal crashes occurred in clear weather, on dry roads, and in the daylight. Excessive speed was reported in 10 of the 24 fatal crashes.

Figures 12A and 12B provide the location of each of the recorded crashes in the study areas. As shown, many of the recorded crashes occurred along I-84 and US 30, as well as key arterials such as Cornelius Pass Road, Skyline Boulevard, Germantown Road, and Corbett Hill Road.

Table 6 Reported Crashes by Severity in Multnomah County Rural Areas (2009 – 2013)

	Crash Severity			Total
	Fatal	Injury	Property Damage Only	
Number of Reported Crashes	24	511	467	1,002
Percentage of Total Crashes	2%	51%	47%	100%

Seasonal Trends

To understand any possible weather and/or seasonal trends, Exhibit 4 shows the number of crashes reported by month over the five year period.

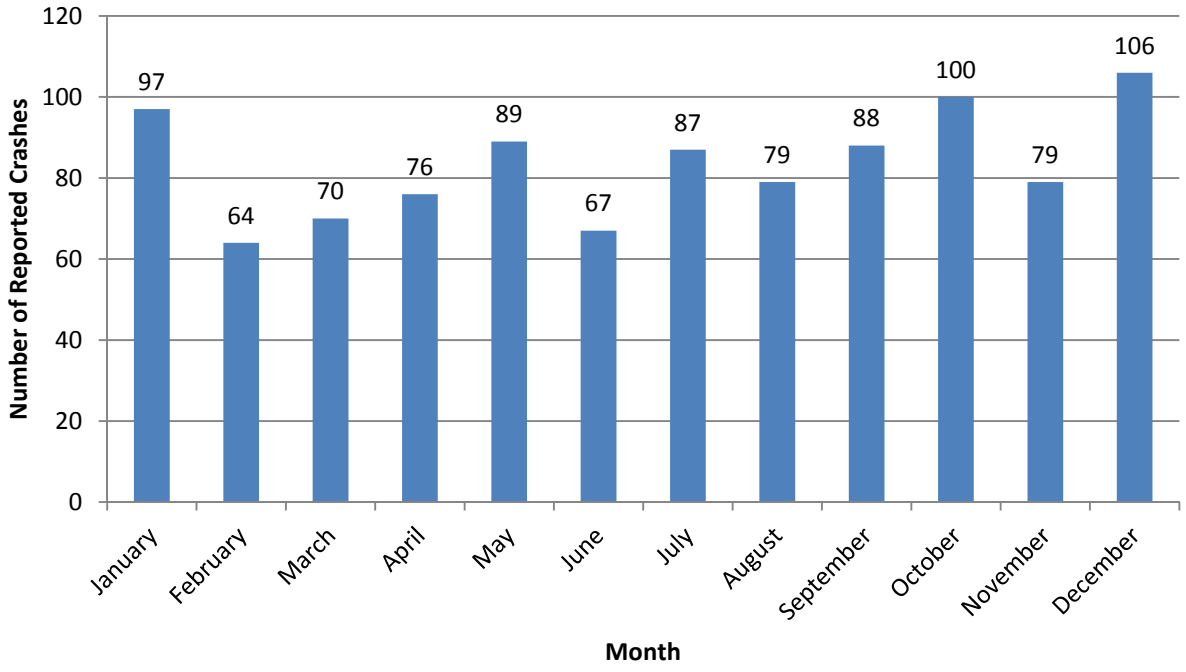


Exhibit 4 Reported Crashes by Month (2009-2013)

As shown in Exhibit 4, the highest crash frequency occurred during late fall winter months, from October through January. Winter months in Multnomah County can include inclement weather conditions producing wet, icy, and/or snowy conditions. Further review of crashes in October, November, December, and January (382 crashes) indicate that 60% (228 crashes) occurred on roadway surfaces that were wet, icy, or snow-covered. Additionally, 55% (210 crashes) occurred in dark, dawn, or dusk lighting conditions.

Crash Type Analysis

Over the study period, 54% of crashes (537 crashes) were single vehicle crashes including fixed object, overturn, and non-collision crashes. Speed was a contributing factor in one-third (327 crashes) of all crashes. Over 40% (409 crashes) occurred on roadway surfaces that were wet, icy, or snow-covered. Forty-two percent (417 crashes) occurred in dark, dawn, or dusk lighting conditions.

Four pedestrian crashes were reported in the study period with one resulting in a fatality. The fatality occurred in dark, rainy conditions. The report states the pedestrian was in the roadway illegally and wearing non-visible clothing. The pedestrian crashes occurred at the following locations:

- US 30 – 2,000 feet south of Watson Road
- Lusted Rd – 3,300 feet from Cottrell Road
- Hurlburt Rd – 260 feet east of Kimbley Rd (west access)
- Haines Road and Thompson Mill Road

Eleven bicycle crashes were reported in the study period all resulting in non-fatal injuries. All but one crash occurred under clear weather conditions, dry road surface, and in the daylight. The majority (seven) of the crashes were attributed to not yielding to the right-of-way. The other causes were following too closely, non-motorist illegally in the roadway, and other improper driving. The bicycle crashes occurred at the following locations:

- Skyline Boulevard and Brooks Road
- Laidlaw Road and Thompson Road – two crashes occurred here
- HCRH and Crown Point Highway – two crashes occurred here
- Foster Road and Richey Road
- Lusted Road 2,000 ft north of Dodge Park Boulevard
- Lusted Road at Sam Barlow High School
- HCRH – 400 feet west of Lucas Road
- Dodge Park Boulevard and Short Road
- HCRH and Evans Road

Intersection and Segment Crash Analysis

In addition to the countywide data, ten locations, four intersections and six segments within the study areas, were analyzed and compared to statewide averages for similar facilities, when possible.

Intersection Crash Rates

Reported crashes at four key intersections are summarized in Table 7. Intersection exposure was measured in terms of total entering vehicles (TEV), derived from the link volumes data. To provide a basis of comparison, ODOT identifies 90th percentile crash rates for similar facilities in the Analysis

Procedures Manual, Exhibit 4-1 (Reference 1). As shown, all of the study intersections reported higher crash rates than ODOT's 90th percentile crash rates for the respective intersection type.

Table 7 Reported Crashes at Study Intersections

Intersection ID and Name	# of Crashes	TEV (in millions)	Crash Rate	90th Percentile Crash Rates	Crash Type						Severity		
					Angle	Rear-End	Turning	Ped/Bike	Fixed-Object	Other	PDO	Injury	Fatality
A - Reeder Road/Sauvie Island Road	6	4.95	1.21	0.475	0	0	2	0	4	0	3	2	1
B - Foster Road/172nd Avenue	25	17.82	1.40	0.475	0	14	8	0	2	1	6	19	0
C - Foster Road/Richey Road	10	17.82	0.56	0.475	1	2	1	0	4	2	5	5	0
D - Orient Drive/282nd Avenue	17	13.78	1.23	0.579	3	6	6	0	2	0	9	8	0

[1]TEV = Total entering vehicles
[2]PDO = Property damage only
[3]Crash Rate = Crashes per million entering vehicles

One fatality occurred at the study intersections above. It was a single-vehicle, fixed-object crash that occurred at the Reeder Road/Sauvie Island Road intersection. It occurred in the rain, with wet road surface, and in the dark. Speeds too fast for conditions was a contributing factor.

Segment Crash Rates

Reported crashes along study roadway segments are summarized in Table 8. Exposure on the segments was measured based on average daily traffic (ADT) volumes from available link volume data. ODOT publishes statewide average roadway segment crash rates for the past five years for urban and rural areas, by functional classification. The statewide average roadway segment crash rates for rural minor collectors are provided in Table 8 for comparison to calculated crash rates for highways in the study areas. As shown, all of the study segments reported higher crash rate than the state average crash rates for the respective functional classification.

Table 8 Reported Crashes at Study Roadway Segments

ID	Segment Name	Segment Boundaries	Segment Length (miles)	Number of Crashes	ADT	Crash Rate (2009 – 2013 average)	State Average	Crash Type		Severity		
								Fixed-Object	Other	PDO	Injury	Fatality
E	Germantown Road	Between Skyline Road and Old Germantown Road	2.0	25	4800	2.85	1.30	14	11	12	11	2
F	Skyline Boulevard	From ½ miles north of Rock Creek Road to ¾ miles south of Rock Creek Road	1.25	8	1340	3.27	1.30	6	2	1	7	0
G	Corbett Hill Road	Between I-84 and Historic Columbia River Highway	1.4	29	2520	6.32	0.71	6	23	12	17	0
H	Lusted Road	¼ of a mile east starting 1/3 of a mile east of Cottrell Road	0.25	7	650	5.90	1.30	4	3	3	3	1
I	Hurlburt Road	From Springdale School to Kimbley Road (East)	1.5	11	1490	4.05	1.30	5	6	4	7	0
J	Stark Street	Between 36th Street and Historic Columbia River Highway	1.3	21	5410	2.13	0.71	12	9	8	11	2

Findings from the study intersection and segment crash analysis indicate the following:

- Corbett Hill Road, which is an arterial connecting to I-84, has the highest crash frequency among the study segments.
- The intersection of Reeder Road and Sauvie Island Road has the highest crash frequency among the study intersection.
- Over 46% of reported crashes along the studied intersections and segments areas occurred on a wet, icy, or snowy roadway.
- Over a third (52 crashes) of the crashes recorded at the study intersections and segments indicated speeding or speed too fast for conditions as a contributing cause.
- Of the six fatal crashes on the study segments, five were fixed object crashes with four of attributing speed too fast for conditions or speeding as a contributing factor. The other fatal crash involved a pedestrian who was in the roadway illegally.

- Four pedestrian and bicycle crashes were reported at the study intersections and segments throughout the five year analysis period, one of which was fatal and described above. Three of the four crashes occurred with clear weather conditions, on dry roadways, in the daylight. The two reported causes were "did not yield right-of-way" and "non-motorist illegally in roadway."
- Among the injury crashes, the majority were single-vehicle crashes. Speed was a contributing factor in approximately half of the reported injury crashes. Over half of the injury crashes occurred with some sort of precipitation on the roadway.

Potential Countermeasures

Given that many of the recorded crashes are single vehicle, low-cost systemic treatments such as shoulder widening and installation of centerline and shoulder rumble strips may be effective in helping to reduce the severity and frequency of crashes on rural roadways in the study area. Treatments addressing speed as well as informing drivers of inclement roadway conditions may also be effective measures. A summary of potential countermeasures is provided below.

Shoulder Widening

Wider paved shoulders could provide drivers more opportunity to recover before departing the roadway and/or to slow their vehicles to a controlled stop, thereby reducing single vehicle crashes.

Shoulder Rumble Strips

Installing shoulder rumble strips on both sides of the roadway has the potential to reduce vehicles inadvertently "running off the road." Although shoulder rumble strips for rural two-lane roads are not currently included in the Highway Safety Manual (HSM) (Reference 2), NCHRP Report 641 *Guidance for the Design and Application of Shoulder and Centerline Rumble Strips* evaluated their effectiveness in a rural two-lane road setting (Reference 3). NCHRP Report 641 indicates shoulder rumble strips on rural two-lane roads can reduce run off the road crashes by 15 percent. The report also indicates shoulder rumble strips on rural two-lane roads can reduce fatal and injury run off the road crashes by 29 percent.

NCHRP Report 641 indicates shoulder rumble strips are more effective when placed close to the edgeline than when they are placed further from the edgeline. The report also stated shoulder rumble strips appear to have a positive safety benefit in low-light conditions.

Centerline Rumble Strips

Research has shown centerline rumble strips can help reduce rural roadway crashes. NCHRP Report 641 indicates the presence of centerline rumble strips can result in a nine percent reduction in total crashes and 12 percent reduction in fatal/injury crashes. The largest crash reduction for centerline

rumble strips is realized for targeted crashes which are defined as head-on and opposite-direction sideswipe crashes. On low volume roads, crashes involving a vehicle crossing the centerline end up recorded as single-vehicle run off the road crash. Research shows the combination of centerline and shoulder rumble strips could potentially reduce the total number of crashes along a corridor; including fatal and injury crashes.

Speed Treatments

Speed Feedback Signs

Electronic signs can measure and dynamically display the speed of approaching vehicles. Certain signs may also be accompanied by a "SLOW DOWN" or similar message. Average speed reductions of approximately 6 miles per hour have been observed with installation of the feedback signs.

Optical Speed Bars

Transverse markings placed in and across travel lanes with the intent of increasing the optical flow of information and creating a sense of increasing speed could be installed leading up to horizontal curves and intersections. Studies have shown speed reductions of 1 to 9.5 mph.

High Friction Surface Treatment

To address weather-related crashes, the County and ODOT could consider installing high friction surface treatment (HFST) to increase traction for vehicles. HFST maintains pavement friction by applying durable aggregates using a polymer binder to a specific area. The Federal Highway Administration (FHWA) has tested HFST in a number of types of applications. HFST may be applied on areas where high friction or anti-skidding properties are particularly desired. This could include segments having horizontal curves or pavement surfaces susceptible to icing like bridges.

BRIDGES

Within the study areas, the County owns 26 bridges and associated supporting structures. With the exception of the Willamette River bridges, the majority of the County's bridges are in the rural areas. The locations of the County bridges are shown Figures 13A and 13B as well as Table 11. The table also provides information about the structural sufficiency rating for each bridge. ODOT maintains an inventory of bridge conditions within Multnomah County. State, County, and City owned facilities over 20-feet in length are assigned a sufficiency rating based on inspections conducted at regular intervals, usually every two years. The sufficiency rating is a measure between 0 and 100 calculated by the Federal Highway Administration (FHWA), based on factors such as condition, materials, load capacity, and geometry (i.e., dimensions). FHWA uses the rating as a tool to prioritize the allocation of funds for bridge repairs. In general, bridges with a sufficiency rating of less than 50 are given priority. The sufficiency rating is used to identify deficiencies, which may include structural issues or functional

issues. For example, older bridges may be narrow and not designed to the same width or height clearance of today's standards. Therefore, a sufficiency rating does not necessarily indicate a structural issue. Structural sufficiency rating data was limited for the study areas; information was provided for four of the 26 bridges. The Latourell Falls Road Bridge is currently considered structurally deficient.

Table 9 Multnomah County Bridges

Map ID	County Bridge ID	Name	Sufficiency Rating	Sufficiency
1	511	Burnside Bridge	N/A	N/A
2	2757	Hawthorne Bridge	N/A	N/A
3	2758	Morrison Bridge	N/A	N/A
4	4522	Beaver Creek Bridge	N/A	N/A
5	6757	Broadway Bridge	N/A	N/A
6	6879	Sellwood Bridge	N/A	N/A
7	9321	223rd/Marine Drive Overpass	N/A	N/A
8	11112	Stark Street Bridge	N/A	N/A
9	11113	Stark Street Viaduct	N/A	N/A
10	17211	207th Ave over UPRR	N/A	N/A
11	17356	238th Ave over UPRR	N/A	N/A
12	18206	207th over Fairview Creek	N/A	N/A
13	20136	Sauvie Island Bridge	N/A	N/A
14	20722	282nd over Johnson Creek	N/A	N/A
15	25T05	Halsey Street Box Culvert	N/A	N/A
16	25T08	252nd Avenue Bridge	N/A	N/A
17	25T16	Jenne Road/174th Av Bridge	N/A	N/A
18	51B002	Highland Drive over Johnson Creek	N/A	N/A
19	51C09	Littlepage Rd Box Culvert	N/A	N/A
20	51C10	Latourell Falls Road Bridge	32.9	Structurally Deficient
21	51C12	Smith Road Bridge	91	Not Deficient
22	51C13	Gordon Creek Road Viaduct	59.7	Not Deficient
23	51C14	Gordon Creek Bridge	57	Not Deficient
24	51C15	Circle Avenue Bridge #1	N/A	N/A
25	51C34	Circle Avenue Bridge #2	N/A	N/A
26	6967A	257th over UPRR	N/A	N/A

RAIL

Figures 14A and 14B depict the railroads traversing Multnomah County as well as the locations of public and private railroad crossings in the rural areas. The Portland and Western railroad has two routes through the west side of the County, one going up the West Hills and the other along Highway 30. Union Pacific has a route on the east side of the County that follows I-84. The majority of the

railroad crossings throughout the rural areas are private crossings (crossings of private roads, driveways, and accesses). There are two public County owned crossings in the Multnomah Channel area; one at-grace crossing located on Lower Rocky Point Road on the east side of Highway 30 and one grade-separated crossing on NW McNamee Road.

BICYCLE SYSTEM

Figures 15A and 15B depict the bicycle system in the study area. As shown, only three facilities have on-street bike facilities, including Highway 30 (ODOT facility) in West County, and Highway 26 (ODOT facility) and Stark Street in East County. Figures 15A and 15B identify three design treatments used to accommodate bicycle travel on roadways and four design treatments used to accommodate bicycle travel that is separated from the roadway. These design treatments are described below.

Bike Lane — Some roadways dedicate a portion of the roadway for preferential use by bicyclists. Bike lanes are appropriate on urban arterials and major collectors where motor vehicle speeds are significantly higher than bicycle speeds. Bike lanes on local streets are appropriate where bicycle volumes are high, vehicle speeds are higher than 25 miles per hour, and/or poor sight distance exists. Bike lanes must always be well-marked to call attention to their preferential use by bicyclists.

Shoulder Bikeways – In rural areas, paved shoulders that are a minimum of 4 feet wide, are commonly considered shoulder bikeways. These facilities are not shown on the map as paved shoulder width data is not currently available. However, Figures 9A and 9B show paved widths. Two-lane roadways with a paved width of 28 – 31 may have 4 foot paved shoulders. Two-lane roadways with a paved of 32 feet or greater are likely to include 4 foot paved shoulders on each side of the roadway. As shown in Figures 9A and 9B, very few rural facilities have a 28 foot or greater paved width.

Bicycle Boulevard – The bicycle boulevard is a refinement of the shared roadway treatment. On bicycle boulevards, the typical operation of a local street is modified to function as a through street for bicyclist while maintaining local access for motor vehicles. Traffic calming devices reduce motor vehicle speeds and through trips and traffic controls limit the potential for conflicts between bicyclists and motorists.

Low Traffic Through Street (Shared Roadway) — On a shared roadway, bicyclists and motorists share the same travel lanes. A motorist will usually have to cross over into the adjacent travel lane to pass a bicyclist. Shared roadways are common on neighborhood streets and on low volume rural roads and highways and may, or may not, include “sharrows” (pavement marking that indicate the shared use of the roadway). Allowing bicycle traffic to mix with automobile traffic is acceptable where the average daily traffic (ADT) on a roadway is less than 3,000 vehicles per day. Generally, most collectors in the rural parts of Multnomah

County carry less than 3,000 ADT, but most arterials, and some collectors within UGBs, carry more than 3,000 ADT.

Regional, Community, and Local Multi-Use Trails — Multi-use trails are separated from the roadway by an open space or barrier. Multi-use trails are typically used by pedestrians and bicyclists as two-way facilities. Multi-use trails are appropriate in corridors with high traffic volumes not well served by the street system. Such paths can also be used to create pedestrian and bicycle short cuts and can serve as elements of a community recreational trail system. They can be used for regional travel as well as within a community and locally.

Despite the lack of bike lanes and shoulder bikeways, many of the County's rural roadways are popular cycling routes.

PUBLIC TRANSPORTATION SYSTEM

Three transit agencies serve Multnomah County's rural areas, including TriMet, Columbia County Rider, and Sandy Area Metro. The highlights of this service include:

- TriMet primarily serves Portland Metro urban areas but has transit stops located near the perimeter of several of the County's rural areas including the West Hills, Sauvie Island, Troutdale and Gresham.
- TriMet has a Park-and-Ride located on Sauvie Island and several in Gresham that could serve residents of East County.
- Columbia County Rider has a route along Highway 30 but it does not currently stop on Sauvie Island but may in the future.
- Sandy Area Metro has a route along Highway 26 in the West of Sandy River area.

Figures 16A and 16B show the transit routes, stops, centers, and park n' ride locations in and near the rural areas. As shown in Figures 16A and 16B, the County's rural areas are not served by fixed route transit; however, fixed route transit and park-and-ride facilities are provided at the urban fringes to help provide access to commuters from rural areas.

TRUCK FREIGHT ROUTES

Figures 17A and 17B show the freight routes in the study areas. ODOT has two freight routes through the rural areas: Highway 30 in West County and on Interstate 84 in East County. Multnomah County has a number of freight routes extending into the rural areas from the ODOT freight routes.

AIR TRANSPORTATION SYSTEM

The Sandy River Airport is the only public airport located in the study areas. In addition, Lehman Airport is a private airport located three miles southeast of Corbett. Portland International Airport serves most air passenger and freight transportation needs for Multnomah County.

FUNDING ANALYSIS

This section summarizes the historical transportation funding sources for Multnomah County. The information summarized below will be used to assist in identifying potential funding gaps associated with future county projects and programs.

Historically, transportation funds have been collected through local sources, private contributions, state government, federal government, and non-jurisdiction work which includes non-road and street work and work for other jurisdictions. Local sources include, but are not limited to, fuel taxes and local governments such as cities. Motor vehicle registration fees were introduced and collected starting in the year 2011 and are a part of the funds from local sources. Federal stimulus funds (ARRA) dedicated to transportation projects represent a new federal funding source for 2010. The transportation program includes streets, sidewalks, bike paths, railroad crossings, and transit.

Exhibit 5 reports the total transportation funding for Multnomah County for the year 2005 through 2014. Table 12 details the County's transportation funding by source. As shown, 2013 and 2014 received the most funding over the last decade with over double the funding of prior years. In 2013, funding from local sources spiked due to sales of bonds totaling $128,000,000. Funds from fuel tax have remained fairly consistent over the last decade contributing between $6,500,000 and $7,400,000 each year. Like fuel tax, state funds have remained within a relatively narrow range, between $29,000,000 and $39,000,000, with the exception of 2005 which saw a contribution of about $55,600,000. State funding is the biggest funding source throughout the past ten years, excluding the 2013 sale of bonds as previously mentioned.

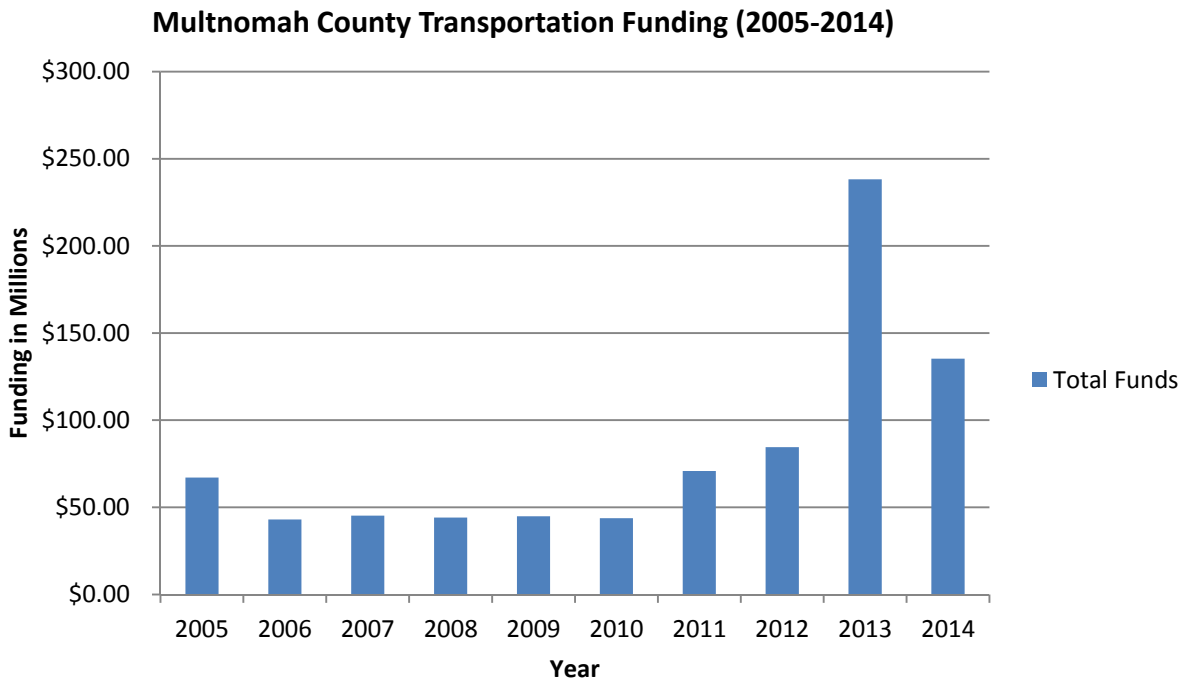


Exhibit 5 Multnomah County Funding for Transportation (2005-2014)

Table 10 Multnomah County Funding for Transportation Years 2005-2014

Year	Source						Total
	Fuel Tax	Local Sources	Private Contributions	State Funding	Federal Funding	Non-Jurisdictional Work	
2005	$6,744,233	$2,037,616	$0	$55,586,395	$1,869,318	$837,315	$67,074,877
2006	$7,114,721	$2,337,147	$213,243	$31,040,765	$1,417,995	$943,352	$43,067,223
2007	$7,110,272	$1,567,375	$130,880	$32,385,736	$1,105,605	$2,963,682	$45,263,550
2008	$7,356,083	$1,339,539	$0	$29,298,036	$3,418,294	$2,681,591	$44,093,543
2009	$6,878,197	$2,569,042	$0	$30,370,214	$2,884,584	$2,179,068	$44,881,105
2010	$6,982,150	$1,311,827	$0	$29,004,662	$4,363,057	$2,121,595	$43,783,291
2011	$7,052,045	$17,519,052	$0	$33,561,224	$9,883,713	$2,856,357	$70,872,391
2012	$6,811,257	$26,294,096	$0	$36,227,457	$12,990,232	$2,222,274	$84,545,316
2013	$6,573,115	$188,254,386	$0	$38,972,767	$2,399,555	$1,992,451	$238,192,274
2014	$6,627,984	$61,920,847	$0	$38,527,230	$26,201,381	$2,059,726	$135,337,168

Exhibit 6 reports the total expenditures of Multnomah County for transportation in the years 2005 through 2014. Table 11 summarizes the County's transportation expenditures by source. Years 2013 and 2014 had the most spending with over double what the majority of the other years spent. Those years also saw additional local funding from bonds as discussed above. Spending on Capital Projects

and Payments to other Governments/Jurisdictions were the two largest expenditures over the past decade. Payments to other governments and jurisdictions included payments to counties, cities, other local agencies, and state and state highway projects.

Spending on capital projects increased significantly starting in 2012. The majority of the spike in spending went to system preservation. The year 2012 increase was almost evenly split between project engineering and system preservation, each with approximately $21 million, but 2013 and 2014 spent about $56 million and $73 million, respectively, on system preservation alone. Prior to the bond funds, average annual spending on capital projects was approximately $13 million including both engineering and preservation projects.

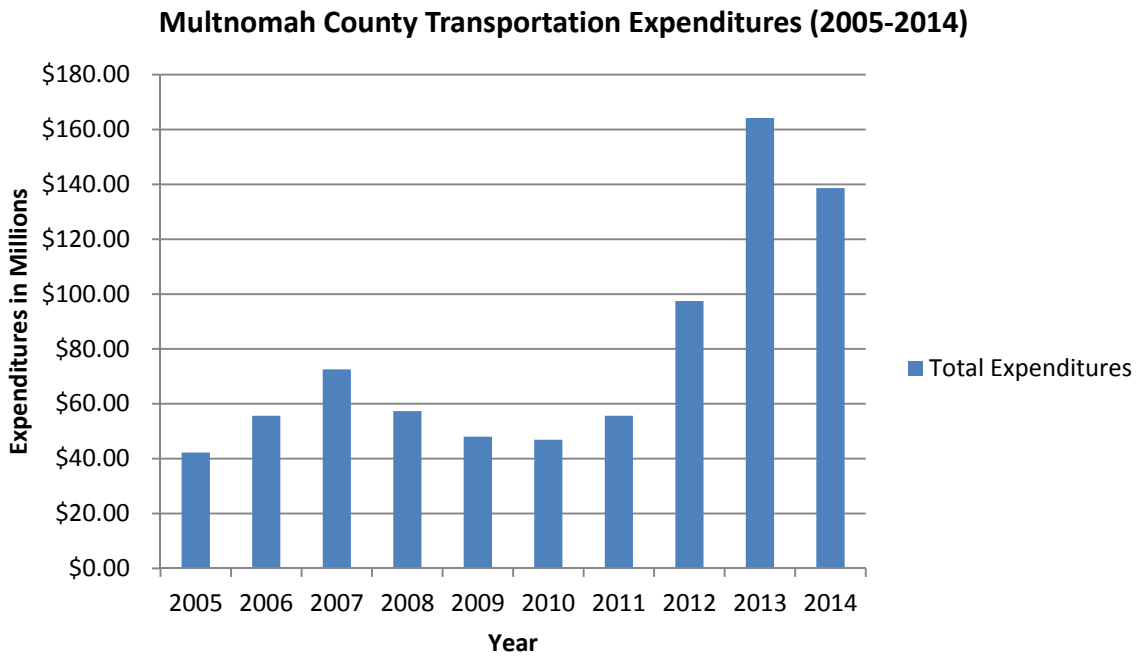


Exhibit 6 Multnomah County Expenditures for Transportation (2005-2014)

Table 11 Multnomah County Expenditures for Transportation Years 2005-2014

Year	Source							Total
	Capital Projects	Operations & Maintenance	Administration & General Engineering	Match Payments for Local Agency Projects	Debt Service on Local Obligations	Payments to Other Governments /Jurisdictions	Reimburse -ments[1]	
2005	$8,822,124	$7,403,780	$3,423,016	$0	$288,022	$21,349,429	$942,708	$42,229,079
2006	$7,788,562	$7,164,162	$3,943,756	$0	$291,289	$35,333,705	$1,440,134	$55,661,608
2007	$21,856,624	$5,821,601	$4,080,165	$14,534,934	$287,996	$23,493,283	$2,513,914	$72,588,517
2008	$18,669,634	$5,942,808	$3,931,355	$3,065,694	$287,996	$22,903,091	$2,508,531	$57,309,109
2009	$11,156,600	$7,797,336	$4,318,754	$1,356,283	$288,000	$20,885,234	$2,179,068	$47,981,275
2010	$8,481,991	$9,107,884	$3,126,007	$1,458,258	$288,000	$20,008,305	$2,432,796	$46,903,241
2011	$15,646,108	$8,445,260	$2,828,115	$1,487,761	$288,000	$24,673,775	$2,263,774	$55,632,793
2012	$54,067,309	$9,061,593	$3,215,765	$780,522	$701,151	$27,415,906	$2,222,275	$97,464,521
2013	$69,568,440	$8,075,180	$4,563,300	$0	$52,495,665	$27,523,385	$1,990,000	$164,215,970
2014	$85,669,337	$7,554,458	$4,582,540	$0	$9,929,719	$28,793,395	$2,109,428	$138,638,877

[1]Expenditures that are reimbursed for work done on others' roads/streets

EXISTING CONDITIONS SUMMARY

The key highlights of the existing conditions are summarized below.

- The primary transportation issue in Multnomah County's rural areas is safety. Identifying and prioritizing safety improvements will be a primary objective of the TSP Update.
- General County-wide trends indicate that some low-cost systemic treatments such as shoulder widening and installation of centerline and shoulder rumble strips may be effective on County facilities in addition to treatments addressing speed and improving intersections with poor geometry.
- Paved shoulders serve multiple functions in rural areas. They increase safety for vehicles, provide space for farm equipment and emergency pull-offs, but they also act as pedestrian and bicycle facilities. The needs and priorities for shoulder improvements for vehicle safety should also be coordinated with additional considerations below.
- Despite the lack of shoulder bikeways, many of the County's rural roadways are popular cycling routes. A desired network and priorities of shoulder bikeway facilities for the purpose of transportation and tourism should be included in the TSP Update.
- County's rural areas are not served by fixed route transit; however, fixed route transit and park-and-ride facilities are provided at the urban fringes to help provide access to commuters from rural areas. Access to these park-and-rides for pedestrians and bicycles should be considered in the TSP Update.
- Multnomah County has a number of designated freight routes extending into the rural areas from the ODOT freight routes. These should be considered in the prioritization of shoulder improvements.

FUTURE CONDITIONS

The following describes future projections for population and employment in unincorporated Multnomah County, projected traffic volumes on ODOT facilities, and an overview of currently planned projects to address existing and future needs.

EMPLOYMENT AND HOUSEHOLD PROJECTIONS

Metro provided information about anticipated employee and household growth in Multnomah County's unincorporated areas. This information is summarized in Table 12. Employment is projected to grow at approximately 3.5 percent per year from 2010 to 2040. Households are projected to grow at about 3.2 percent per year from 2010 to 2040. However, these projections include both the urban and rural areas of unincorporated Multnomah County.

Table 12 Employee and Household Projections for Unincorporated Areas in Multnomah County

Year	2010	2025	2035	2040	2010-2040 Growth	Annual % Growth
Employees	3,961	5,866	7,170	8,100	4,139	3.48%
Households	4,911	6,555	7,092	9,579	4,668	3.16%

Figures 18A and 18B and 19A and 19B depict the projected changes in employees and households by TAZ from 2010 to 2040, respectively. As shown, minimal increases in jobs and housing are projected for the majority of the East County rural areas with the exception of moderate projected growth in households and employment in the western portions of the West of Sandy River area. In West County, Sauvie Island is projected to have moderate growth in employment and the northern portion of the West Hills Rural Area is projected to have moderate growth in both employment and households.

FUTURE TRAFFIC VOLUMES

As discussed in the existing conditions, ODOT collects traffic volumes on all state facilities. They also provide information about future anticipated growth on these same facilities. Table 13 provides estimates of future traffic volumes at the state facilities in the rural areas.

Table 13 Projected Future State Highway Traffic Volumes

Primary Road	HWY	MP	Description	Future Year		Annual Growth Rate (from 2013 to 2033)
				2033	Source	
Columbia River Highway (US 30)	002	18.12	0.30 mile east of Jordan Interchange	31,900	Historic Growth	1.09
	002	22.40	0.30 mile east of Corbett Interchange	30,200	Historic Growth	1.24
	002	25.19	0.20 mile east of Rooster Rock State Park Interchange	30,400	Historic Growth	1.36
	002	28.16	0.30 mile east of Bridal Veil connection	28,400	Historic Growth	1.40
	002	31.89	0.50 mile east of Multnomah Falls Interchange	27,400	Historic Growth	1.37
	002	35.73	0.10 mile east of Historic Columbia Highway (US30)	27,500	Historic Growth	1.40
Mt. Hood Highway (US 26)	026	14.80	0.05 mile south of S.E. Palmquist Road	32,500	Model	0.89
	026	18.30	0.05 mile northwest of S.E. Haley Road	33,300	Model	1.82
Lower Columbia River (US 30)	092	10.75	0.08 mile south of Sauvie Island Road	23,300	Model	1.93
	092	10.95	0.12 mile north of Sauvie Island Road	23,800	Model	2.04
	092	13.12	0.10 mile south of Cornelius Pass Road	24,200	Model	2.03
	092	17.34	0.05 mile south of Rocky Point Road	30,300	Model	1.64

PLANNED PROJECTS

Multnomah County has several different plans that identify transportation improvements in the County's rural unincorporated areas. These projects will be evaluated in the Alternatives Analysis phase of this project to determine if they are still warranted, how they should be prioritized, and if there are additional needs that require additional projects, programs, or policies to address them. Table 14 provides a summary of the currently planned projects by area in the County's Capital Improvement Plan (CIP) and in each of the Rural Area Plans and TSPs (if applicable). The multimodal project locations are shown in Figures 20A, 20B, 21A and 21B.

Table 14 Planned Projects

Document	Project Number	Project Name	Project Description
Sauvie Island/Multnomah Channel			
Westside Rural TSP	1	Sauvie Island Road	Safety improvement – Add to shoulders (4 ft) and add guardrail from Gillihan Road to Reeder Road. Replace culverts. $3,675,000
	2	US 30	Commuter rail study – Conduct study to determine feasibility of commuter rail from Portland to Astoria. $100,000
	3	Gillihan Road	Safety improvement – Add to shoulders (4 ft). $2,055,000
	4	Reeder Road	Safety improvement – Add to shoulders (4 ft). $5,925,000
	5	US 30	Ride share parking – Provide parking for 100 spaces next to truck scale near county line. $325,000
	6	US 30	Speed zone study – Conduct speed zone study to determine safe speed zone from Linnton north. $5,000
	7	US 30/Cornelius Pass Road	Public transportation – Provide commuter transit service from Columbia County over Cornelius Pass Road to Washington County. $78,000/year
	8	Reeder Road	Improve parking and intersection safety with Sauvie Island Road. $250,000
	9	US 30	RAZ service expansion – Expand assuming 20 hours of additional service per work day for one bus. $78,000/year
	10	Sauvie Island Wildlife Refuge	Recreational bike path – Conduct study to determine feasibility of a bike path north of Reeder Road for recreational purposes only, followed by implementation of the findings. $1,060,000
	11	Sauvie Island Road	Improve park and ride – Delineate parking and traffic circulation. $300,000
	12	US 30	Exclusive car pool lane study – Conduct study to determine feasibility and cost of adding a reversible exclusive car pool lane on US 30. $100,000
	13	US 30	Harborton sign installation – Provide signing for Harborton. $ 1,000
	14	US 30	Scenic viewing opportunities – Access provided across railroad tracks adjacent to Burlington Bottoms using existing road approaches (per location). Exact locations to be determined. Providing pull outs of widening along US 30 will not be acceptable on the basis of safety. $350,000
Multnomah County CIPP	15	Sauvie Island Road: Bridge to Reeder Road (PN 159)	Reconstruct road to rural collector standards with 2 travel lanes. Requires working on dike. $8,275,636
	16	Sauvie Island Road: Gillihan Road to Reeder Road	Bike path. $2,114,214
	17	Sauvie Island: Reeder to Ferry Road	Shoulder bikeway. $535,851
Sauvie Island/Multnomah Channel Rural Area Plan	18	Multnomah Channel/U.S. 30	*Ride share parking* – Provide parking for 100 spaces next to truck scale near county line. Project to be coordinated with ODOT, Multnomah, and Columbia Counties.
	19	U.S. 30/Cornelius Pass Road	*Public transportation* – Provide commuter van pool or transit service from Columbia County over Cornelius Pass

			Road to Washington County.
	21	U.S. 30	*Scenic viewing opportunities* – Access provided across railroad tracks adjacent to Burlington Bottoms using existing road approaches (per location).Exact locations to be determined. Providing linear pull outs or widening adjacent to U.S. 30 will not be acceptable on the basis of safety and access management standards.
	21	Cornelius Pass Road	*U.S. 30 intersection improvements* – Include a northbound turn lane and shared northbound left-turn/right-turn lane.
	22	Gillihan Loop Road	*Safety improvement* – Add to 6. 13 miles of shoulders (4 ft).
	23	Reeder Road	*Safety improvement* – Add to 4.33 miles of shoulders (4 ft).
	24	Reeder Road	*Safety improvements* – Improve intersection sight distance with Sauvie Island Road.
	25	Sauvie Island Road	*Safety improvement* – Add to 2.15 miles of shoulders (4 ft) and add guardrail from Gillihan Road to Reeder Road. Replace culverts.
	26	Sauvie Island Road	*Create park and ride* – Delineate parking and traffic circulation. (**Completed since 1998 TSP)**
West Hills			
Westside Rural TSP	27	Cornelius Pass Road	Safety improvement – Find ways to enforce posted speed limits and safe travel speeds. Install photo radar. $20,000
	28	Cornelius Pass Road	Safety improvement – Install reflectors, delineators, and traffic striping. $200,000
	29	Newberry Road	Safety spot improvement – Install guardrail ¼ mile south of US 30 and install speed hump 1.2 miles from US 30. $450,000
	30	Cornelius Pass Road	Speed Zone Study – Conduct speed zone study to determine average running speed, safe operating speed, and needs for enforcement. $5,000
	31	Germantown Road	Safety improvement – Add to 2.22 miles of shoulders (4 ft). $6,744,000
	32	Skyline Boulevard	Safety improvement – Add to shoulders from UGB to Cornelius Pass Road (1.49 miles). $ 2,039,000
	33	Skyline Boulevard	Safety improvement – Add to shoulders from Cornelius Pass Road to Rocky Point Road (4 ft). $ 11,153,000
	34	Skyline Boulevard	Cornelius Pass Road intersection improvements – install signal, provide westbound left-turn lane and through/right lane on Skyline Boulevard. $695,000
	35	Cornelius Pass Road	Safety and capacity needs – Study to look at climbing lanes, guardrail, drainage, addition of shoulders, and alternate routes. $180,000
	36	Germantown Road	Safety spot improvements – Widen lanes on curves only, install center skip like reflective markers, and install mirror at intersection with Old Germantown Road. $750,000
	37	Cornelius Pass Road	Safety Improvement – contract with the City of Portland for speed enforcement. Assume 0.25 staff per year including equipment and overhead. $50,000/year

	38	Skyline Boulevard	Speed zone study – Conduct speed study to determine appropriate speed limit for Skyline Boulevard from Cornelius Pass Road east to city limits of Portland. $5,000
	39	Springville Road	Safety improvement – Add to shoulders (4 ft). $3,160,000
	40	Laidlaw Road	Safety improvement – Add to shoulders (4 ft). $643,000
	41	Thompson Road	Safety improvement – Add to shoulders (4 ft). $100,000
	42	Cornelius Pass Road	Realignment – Recuce curvature and eliminate switchback while minimizing grade increase of 1,500-foor section (assume average cut of 60 feet). $2,020,000
	43	Skyline Boulevard	Safety improvement – Install traffic calming devices such as speed humps to reduce speeds from UGB to Cornelius Pass Road. $485,000
	44	Skyline Boulevard	Scenic viewing opportunities – Acquire property through fee or donation for development of parking area adjacent to roadway. $350,000
	45	Cornelius Pass Road	Safety improvement – Construct pullouts at a number of locations for the purposes of speed enforcement. $750,000
	46	Germantown Road	Safety improvement – Install traffic calming devices such as speed humps to reduce speeds. $887,000
Multnomah County CIPP	47	Cornelius Pass Road: MP 3.0 to MP 3.5 (PN 103a)	Realign and widen Cornelius Pass Road to provide southbound passing lane. $35,135,976
	48	Cornelius Pass Road: MUS 30 to MP 2 (PN 389)	Reconstruct Cornelius Pass Road including passing lane, safety, shoulder and drainage improvements. $54,159,714
	49	Cornelius Pass Road: MP 2 to MP 3 (PN 103)	Widen Cornelius Pass Road, including new box culvert and passing lane. $21,893,536
	50	Germantown Road/Old Germantown Road (PN 726)	Widen Germantown Road to create left turn pocket and improve sight distance. $780,835
	51	Skyline Boulevard: McNamee to Cornelius Pass	Shoulder bikeway. $2,629,164
	52	Skyline Boulevard: Cornelius Pass to Rocky Point	Shoulder bikeway. $15,153,851
	53	Springville Road: Skyline Boulevard to County Line	Shoulder bikeway. $4,254,950
	54	Cornelius Pass Road: (old) St. Helens Road to MP 2	Shoulder bikeway. $3,684,602
East of Sandy River			
Multnomah County CIPP	55	Ogden Road: Mershon to Woodard	Shoulder bikeway. $463,789
	56	Larch Mt. Road: HCRH to End of Road	Shoulder bikeway. $26,341,706
	57	Knieriem Road: Littlepage Road to HCRH	Shoulder bikeway. $3,122,720
	58	Hurlburt Road: HCRH to Littlepage Road	Shoulder bikeway. $4,344,240
	59	Evan Road: Hurlburt Road to HCRH	Shoulder bikeway. $4,463,908
	60	Woodard Road: HCRH to Ogden Road	Shoulder bikeway. $2,338,065

	61	Mershon Road: Ogden to HCRH	Shoulder bikeway. $4,009,646
East of Sandy River Rural Area Plan			
No major capital improvement improvements are proposed within the study area			
West of Sandy River			
West of Sandy River Rural Area Plan	62	Orient Road/Dodge Park Boulevard Realignment	Realign the intersection to create a more perpendicular angle. Driveway modifications would be required to serve the autobody shop in the northwest quadrant of the intersection.
	63	Division Drive/Troutdale Road Realignment	Eliminate the northeast leg of the intersection between SE Division Drive and SE Troutdale Road to create one intersection. Realign each end of the segment proposed for closure. While projected 2020 PM peak hour traffic volumes satisfy signal warrants, signalization is not recommended until additional warrants are satisfied. All-way stop control would provide LOS D with projected 2020 PM peak hour traffic volumes, while adding an eastbound right turn lane would provide LOS C.
	64	302nd Avenue/Orient Drive/Bluff Road Realignment	Potential options include realigning SE Orient Drive to intersect SE Bluff at a more perpendicular angle or creating a left turn lane for eastbound traffic on SE Orient Drive. Either option may require realignment of SE Teton Drive. Further engineering analysis will be necessary to determine a preferred alignment. Signalize realigned intersection when warranted.
	65	Oxbow Drive/327th Avenue Realignment	Channelizing the broad paved area on SE 327th Avenue at the approach to SE Oxbow Drive to create a more perpendicular intersection is recommended to improve sight distance and reduce the potential for conflict between westbound left turns and northbound left turns.
	66	Lusted Road/302nd Avenue/Pipeline Road Realignment/Intersection Consolidation	Further engineering analysis is recommended to determine if intersection consolidation is feasible fiven the surrounding vertical grades and the location of a sewage holding tank in the center of the intersection. Recent parking restrictions enacted by the County may be adequate for the near term.
	67	Lusted Road/Powell Valley Road/282nd Avenue Consolidation	Realignment to connect SE Lusted Road directly with SE Powell Valley Road is included in the County's Capital Improvement Plan and Program. The project would require further engineering analysis and coordination with the City of Gresham to develop a recommend alignment. A traffic signal is warranted based on projected 2020 PM peak hour volumes, and would provide LOS B operations.
	68	282nd Avenue/Stone Road Turn Lanes	The addition of turn lanes in the northbound and southbound direction on 282nd would reduce the high incidence of rear end crashes at this location. Some roadway widening would be necessary.
	69	Shoulder Widening to Meet Updated Standards	Prioritization for shoulder improvements within the West of Sandy River rural area should be given to roadways connecting to school sites, especially Barlow High School. Proposed shoulder widening should be evaluated based on potential impacts on drainage and adjacent productive lands. For shoulders wider than 1.8 meters, the adopted County standards require paved width of 1.5 meters. The remaining 0.3 meters may be unpaved. Shoulder widening should be incorporated into routine roadway maintenance wherever possible.
Multnomah County CIPP	70	Cochran Drive: Troutdale Road to westerly 2175' (PN 145)	Reconstruct to major collector standards: 2 travel lanes, center lane/median, sidewalks, bike lanes, and culvert replacement. $7,442,765

	71	Troutdale Road: Stark St to Division Drive (PN TBD)	Reconstruct with 2 travel lanes; construct center turn lane/median, sidewalks, bicycle lanes between Stark and Strebin. Reconstruct Troutdale Road/Division Drive intersection including new fish culverts. $8,297,000
	72	Sweetbriar Road: Troutdale Road to E City Limit (PN 149)	Widen to neighborhood collector standards with 2 travel lanes, sidewalk and bike lanes. $2,740,748
	73	Orient Drive/Bluff Road (PN 706)	Widen Orient Drive to create eastbound left turn lane to Bluff Road, realign Bluff and Teton to create perpendicular intersection. $685,247
	74	Orient Drive/Dodge Park Boulevard (PN 703)	Widen Orient Drive to create eastbound left turn lane. $373,616
	75	Oxbow Drive/Altman Road (PN 707)	Widen Oxbow Drive to create westbound left turn lane to Altman Road, realign intersection to a 5 perpendicular intersection. $ 790,693
	76	302nd Avenue/Lusted Road (PN 704)	Realign Lusted Road and Pipeline Road to create perpendicular intersection at 302nd, add left turn lane to each leg of intersection. $5,613,717
	77	Division Drive/Troutdale Road (Included in Collector project above) (PN 186)	Realign intersection, eliminating NE leg, producing a 4-way intersection. Replace 3 existing culverts identified as fish barriers. $ -
	78	Dodge Park Boulevard: 302nd to County Line	Shoulder bikeway. $7,592,686
	79	302nd Avenue: Division to Bluff	Shoulder bikeway. $3,878,852
	80	Orient Drive: Welch Road to Dodge Park Boulevard	Shoulder bikeway. $1,523,441
	81	Oxbow Park Road: Oxbow Drive to Road End	Shoulder bikeway. $1,834,695
	82	Oxbow Drive: Division Drive to Hosner Road	Shoulder bikeway. $5,393,681
	83	Oxbow Drive: Hosner Terrace to Oxbow Park Road SE	Shoulder bikeway. $1,259,838
	84	SE Division Drive: UGB to Troutdale Road	Bike lanes. $945,518
	85	Troutdale Road: Strebin Road to 282 Avenue	Bike lanes. $3,292,979
	86	SE Division Drive: Troutdale to Oxbow Parkway	Bike lanes. $3,371,407
Pedestrian Master Plan	87	Stark St: Eavans Ave to 35th St	Add sidewalk to south side
Columbia River Gorge National Scenic Area			
Multnomah County CIPP	88	Historic Columbia River Highway RR Overcrossing: Half miles east of 244th Avenue (PN 199)	Reconstruct railroad bridge to accommodate wider travel lanes, sidewalks, and bike lanes. $9,314,500
	89	Corbett Hill Road/Historic Columbia River Highway (PN 147)	Improve intersection alignment by making stops at right angle. $3,770,920
Other Plans and Projects			

East Metro Connections Plan	90	Sandy River to Springwater multi-modal connection	Projects to provide mutli-modal connections from Downtown Troutdale to Mt. Hood Community College and the Springwater Corridor Trail. CATALYST PROJECTS: Master plan for new multi-modal corridor.
	91	Pleasant Valley	Projects develop the necessary public infrastructure for development of Pleasant Valley Community Plan. CATALYST PROJECTS: Improvements to 174th and Foster.
	92	Catalyst for Springwater District	Projects help develop the necessary public infrastructure for private investment and jobs in this regionally significant employment area. Projects include a new interchange on US 26 and an extension of Rugg Road to connect US 26 and Hogan, as well as collector street improvements to provide needed access for future jobs and employment. CATALYST PROJECTS: New interchange on US 26 and arterial connections.
Pedestrian Master Plan	93	Interlachen Lane: Marine Dr to Blue Lake Rd	Add sidewalks to both sides

FUTURE CONDITIONS SUMMARY

The following highlights key information that can be used as part of future alternatives analyses tasks.

- Population and employment in the rural areas is expected to grow at approximately 3 – 3.5 percent per year. Although not projected to result in traffic congestion in the rural areas, this growth will continue to have impacts on safety and conflicts between different modes.
- Multnomah County has several different plans that identify transportation improvements in the County's rural unincorporated areas. These projects will be evaluated in the Alternatives Analysis phase of this project to determine if they are still warranted, how they should be prioritized, and if there are additional needs that require additional projects, programs, or policies to address them.

NEXT STEPS

The information in this memorandum will be reviewed by County staff and shared with the Transportation Subcommittee of the County's Comprehensive Plan Update Project Advisory Committee. Input will be requested on the existing and future conditions and currently planned project list to provide direction for the alternatives analysis.

REFERENCES

1. ODOT Analysis Procedures Manual
2. Highway Safety Manual
3. NCHRP Report 641 *Guidance for the Design and Application of Shoulder and Centerline Rumble Strips*

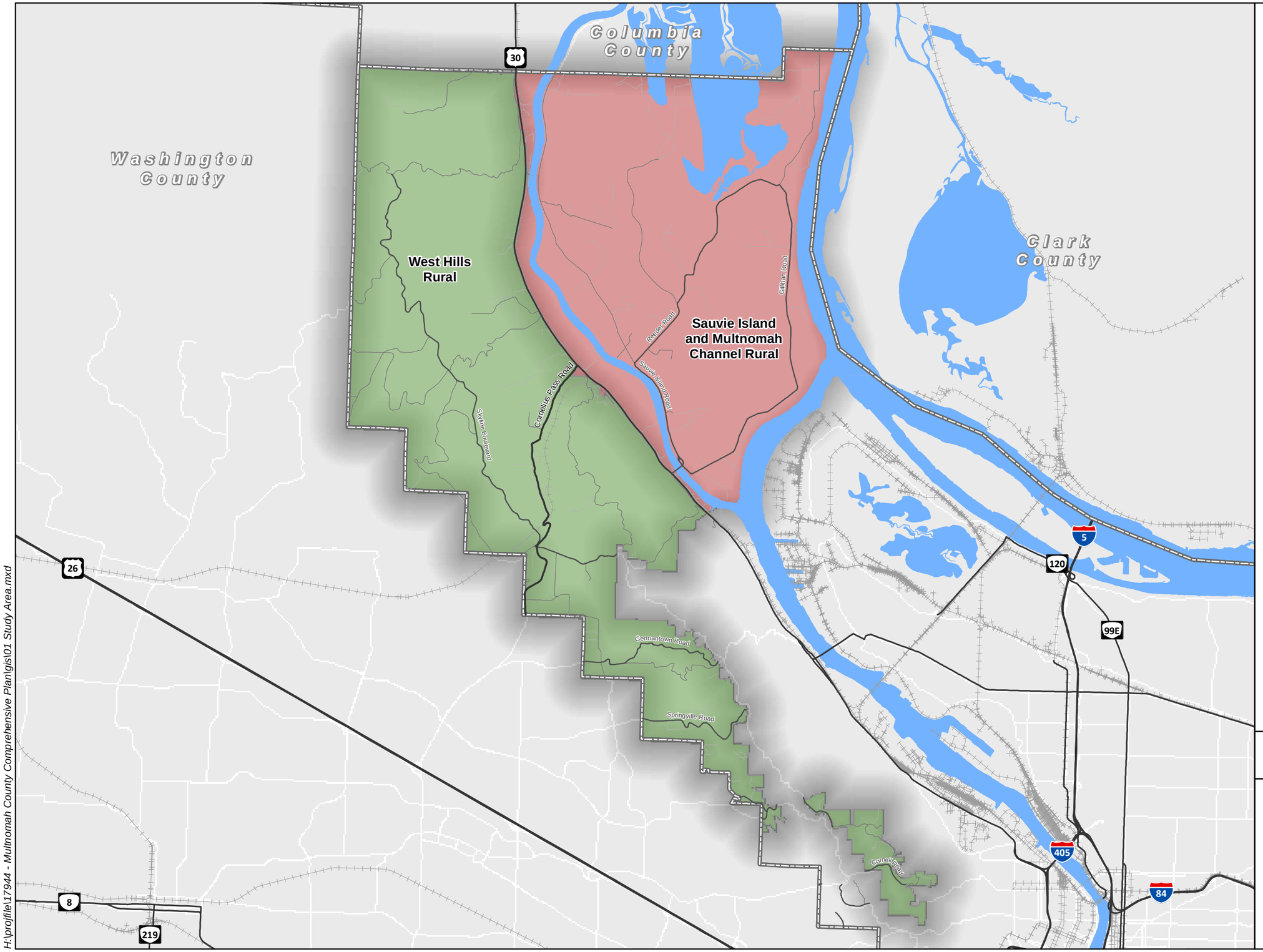
MAP ATLAS

Appendix 1 Map Atlas

Multnomah County
Comprehensive Plan

Figure 1A

Study Area



Plan Areas

- Sauvie Island and Multnomah Channel Rural
- West Hills Rural
- County Boundaries

0 0.5 1 2 Miles

Prepared By:
Kittelson & Associates, Inc.

Date:
6/8/2015

Coordinate System:
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Multnomah County
Comprehensive Plan

Figure 1B
Study Area

Clark County
Skamania County
Hood River County
Clackamas County

Government Island
Interlachen Urban
Troutdale UPA
Pleasant Valley Urban
Springwater
West of the Sandy River Rural
East of the Sandy Rural Area
Columbia RIver Gorge National Scenic Rural
Bonneville Dam

Marine Drive
223rd Avenue
Halsey Street
Glisan Street
257thKane Drive
Stark Street
Woodard Road
Hurlburt Road
Evans Road
Brower Road
Lusted Road
Division Drive
Orient Drive
Bluff Road
Gordon Creek Road
Larch Mountain Road
Troutdale Road
302nd Avenue
Quigley Drive

84
30
212
224
211
26

Plan Areas
- Bonneville Dam
- Columbia River Gorge National Scenic Rural Area
- East of Sandy Rural Area
- Government Island
- Interlachen Urban
- Pleasant Valley Urban
- Springwater
- Troutdale UPA
- West of the Sandy River Rural
- County Boundaries

0 1 2 4 Miles

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Multnomah County
Comprehensive Plan

Figure 2A

Existing Household Density

Columbia County

Washington County

Clark County

Gillihan Road

Reeder Road

Sauvie Island Road

Cornelius Pass Road

Skyline Boulevard

Germantown Road

Springville Road

Cornell Road

30

26

8

219

5

120

99E

405

84

Existing Housing Density / Housholds per Acre by TAZ

- 0.00 - 0.07
- 0.08 - 0.16
- 0.17 - 0.60
- 0.61 - 2.03
- 2.04 - 4.52
- Plan Areas
- County Boundaries

0 0.5 1 2 Miles

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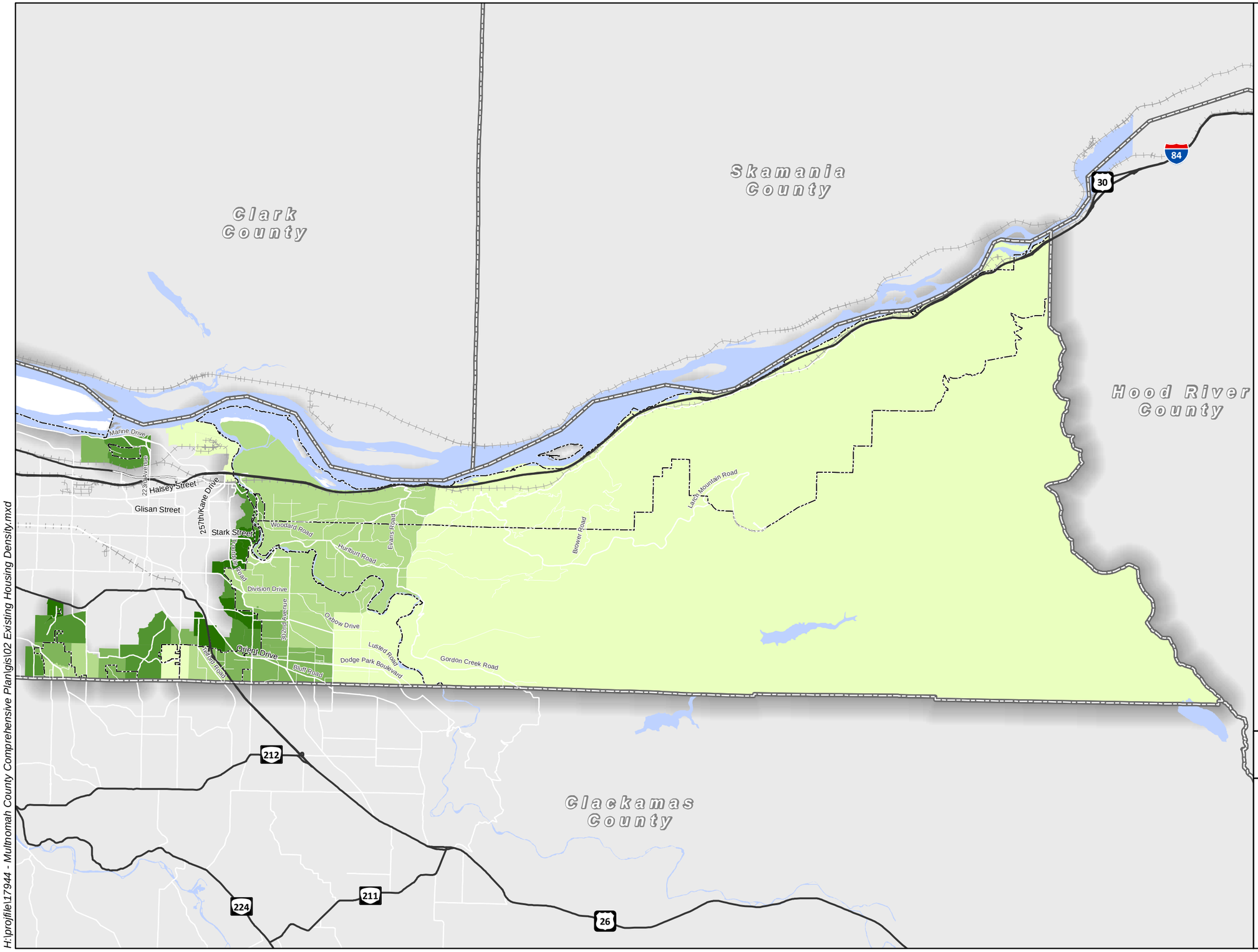

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Multnomah County
Comprehensive Plan

Figure 2B

Existing Household Density

Existing Housing Density / Housholds per Acre by TAZ

- 0.00 - 0.07
- 0.08 - 0.16
- 0.17 - 0.60
- 0.61 - 2.03
- 2.04 - 4.52
- Plan Areas
- County Boundaries

0 1 2 4 Miles

Prepared By:
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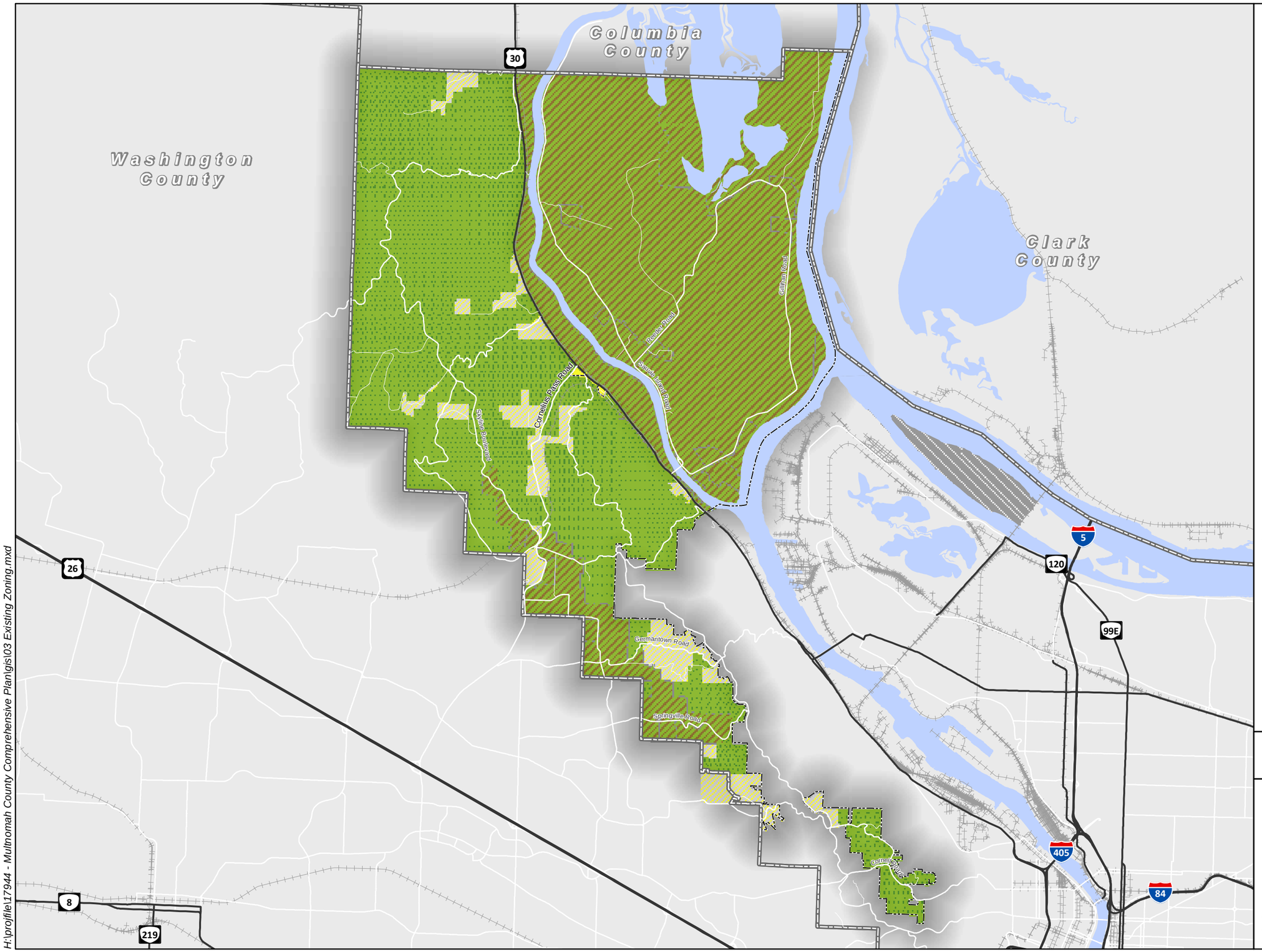
Multnomah County
Comprehensive Plan

Figure 3A

Existing Zoning



Zoning

- Rural Residential
- Rural Center Residential
- Farm Use Areas
- Forest Use Areas
- Portland Zoning Management
- Rural Plan Areas
- County Boundaries

0 0.5 1 2 Miles

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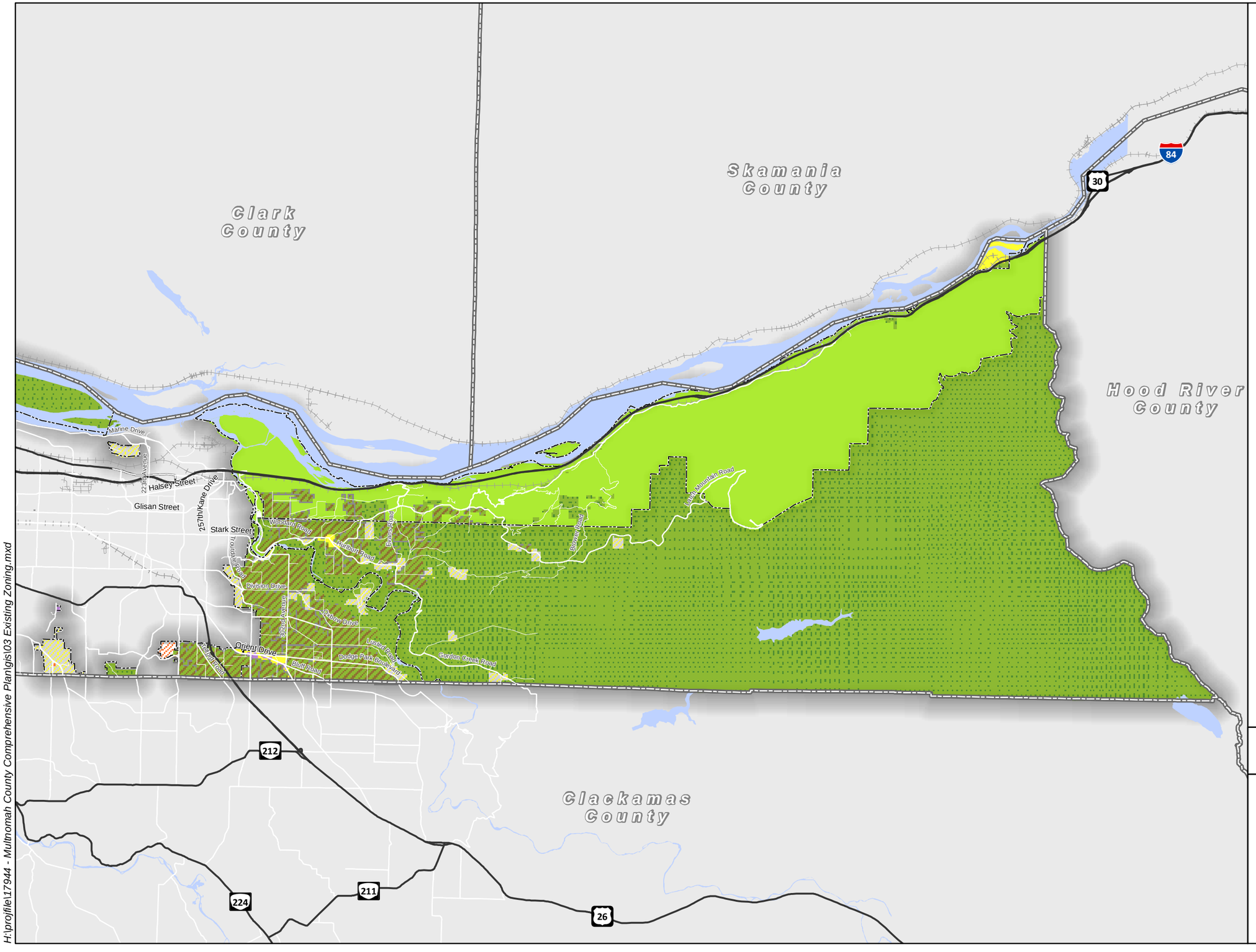
Multnomah County
Comprehensive Plan

Figure 3B
Existing Zoning



Zoning

- Urban Future District
- Rural Residential
- Retail Commercial
- Rural Center Residential
- Industrial, Manufacturing
- Farm Use Areas
- Forest Use Areas
- Columbia River Gorge NSA General Management Area
- Gresham Zoning Management
- Rural Plan Areas
- County Boundaries

0 1 2 4 Miles

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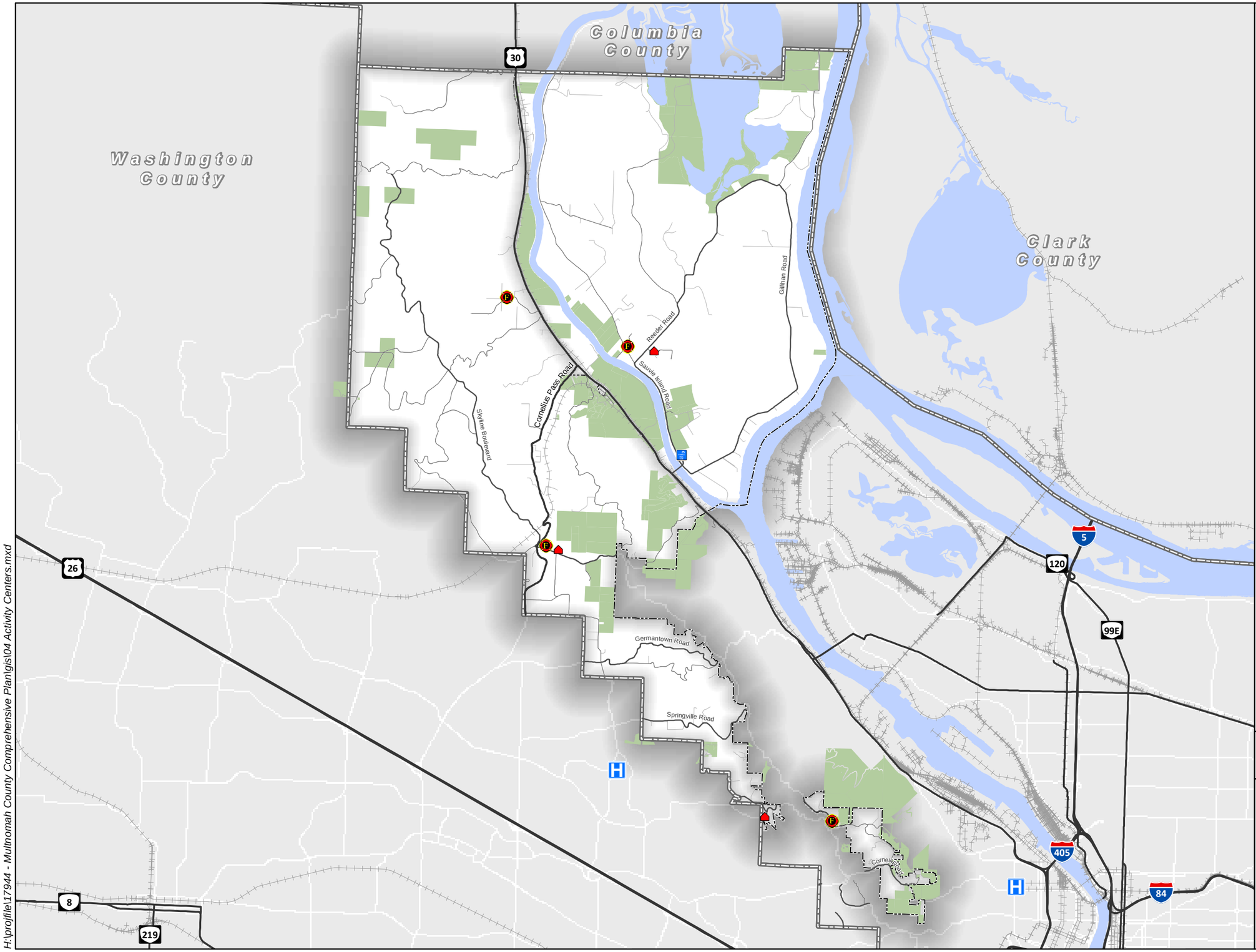

Multnomah County
Comprehensive Plan

Figure 4A
Activity Centers

Activity Centers

- Hospital
- School
- Park N' Ride
- Fire Station
- Public Lands
- Plan Areas
- County Boundaries

0 0.5 1 2 Miles

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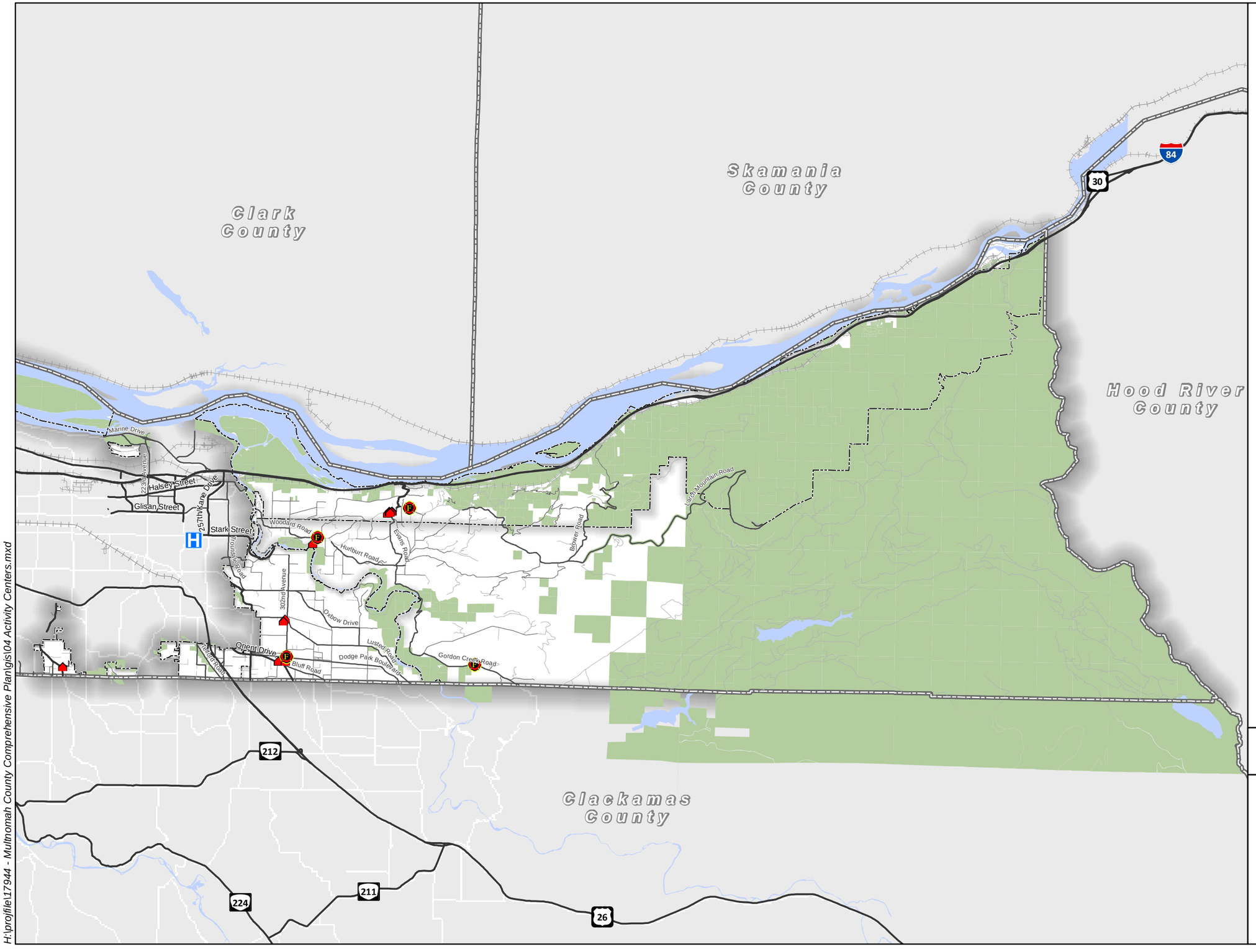
Multnomah County
Comprehensive Plan

Figure 4B
Activity Centers



Activity Centers

- Hospital
- School
- Park N' Ride
- Fire Station
- Public Lands
- Plan Areas
- County Boundaries

0 1 2 4 Miles

Prepared By:
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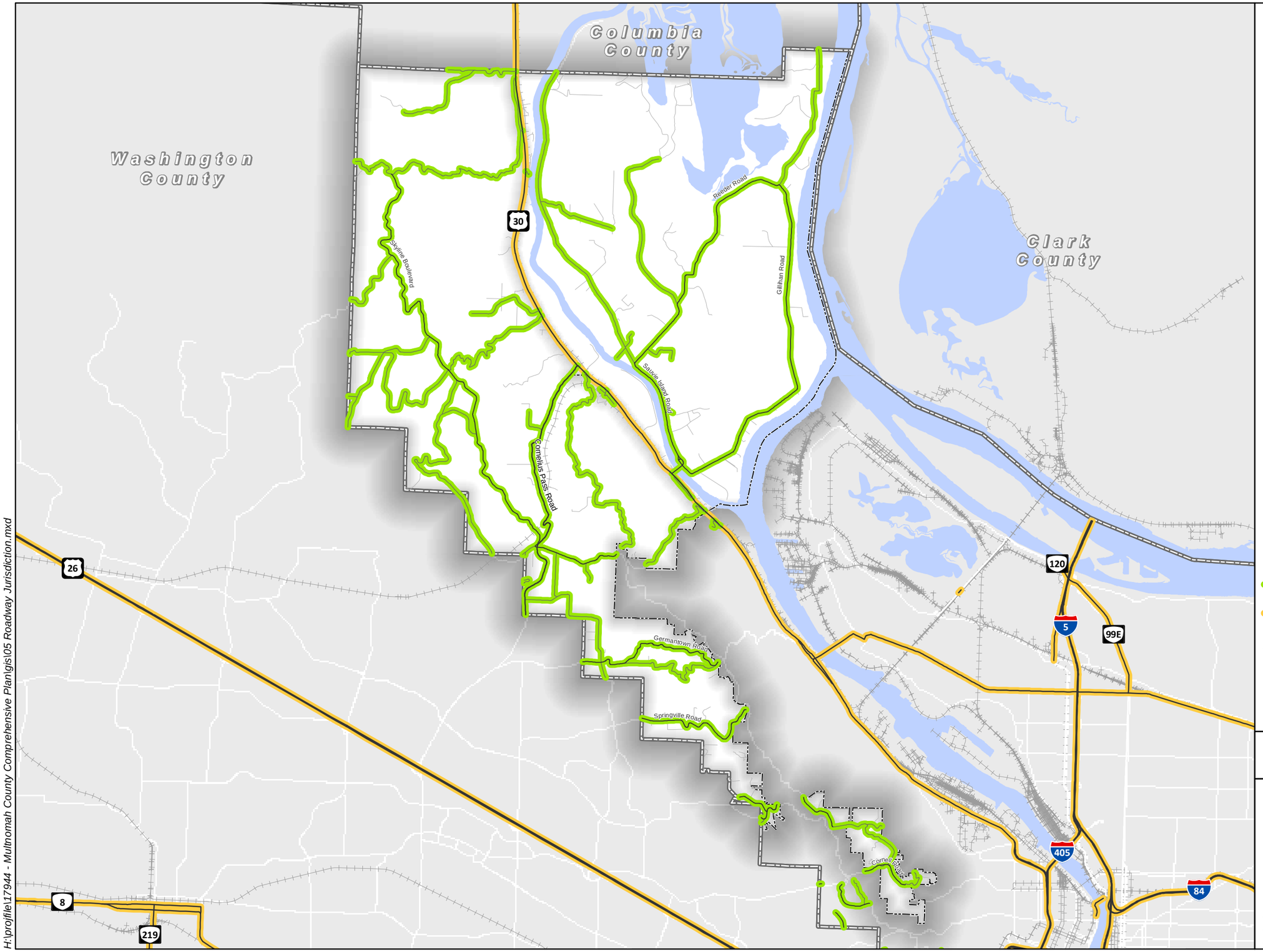

Multnomah County
Comprehensive Plan

Figure 5A

Roadway Jurisdiction

- Multnomah County Roadways
- ODOT Roadways
- Local Roads (not maintained by county)
- Plan Areas
- County Boundaries

0 0.5 1 2 Miles

Prepared By:
Kittelson & Associates, Inc.

Date:
6/8/2015

Coordinate System:
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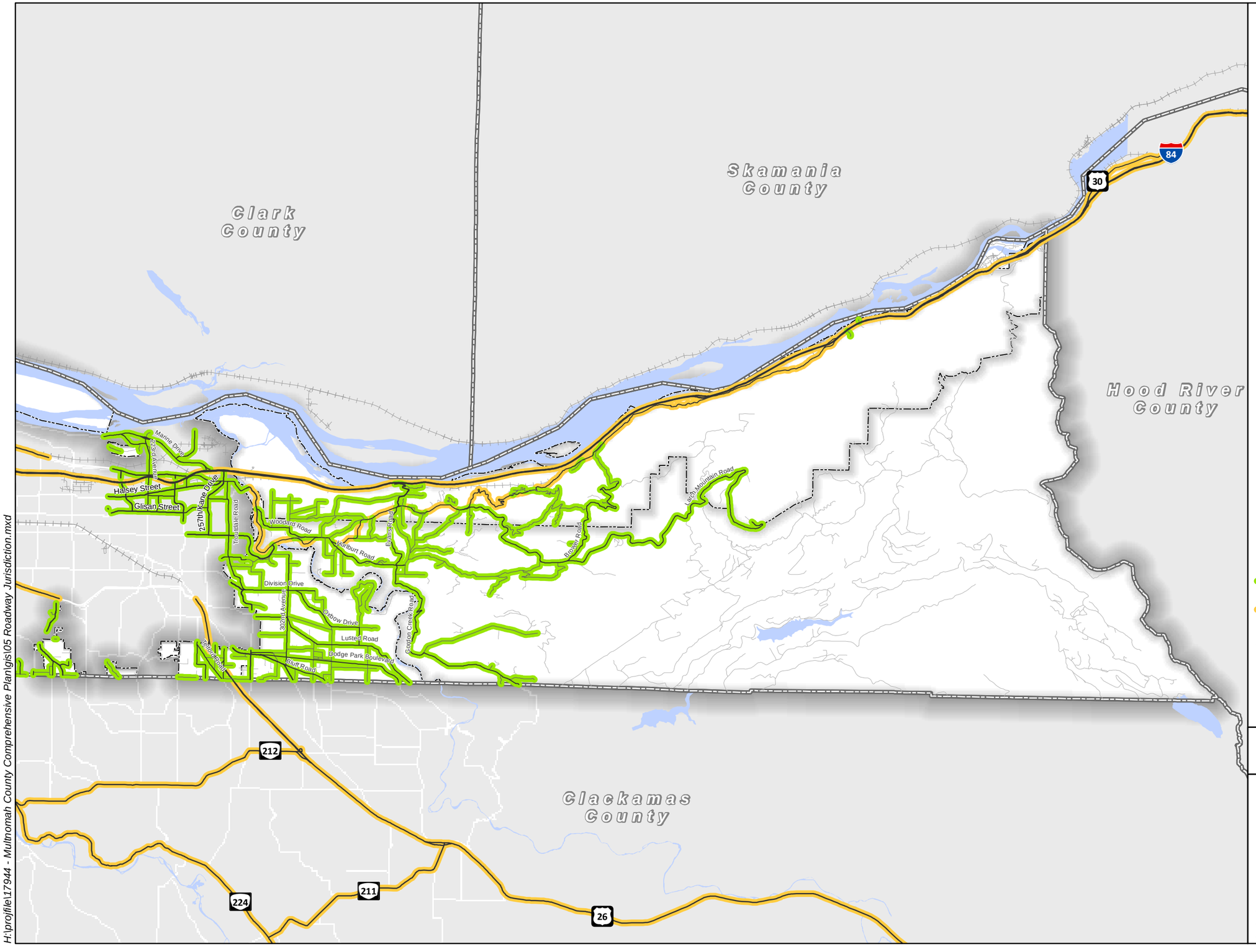
Multnomah County

Comprehensive Plan

Figure 5B

Roadway Jurisdiction



Multnomah County Roadways

ODOT Roadways

Local Roads (not maintained by county)

Plan Areas

County Boundaries

0 1 2 4 Miles

Prepared By:
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Date:
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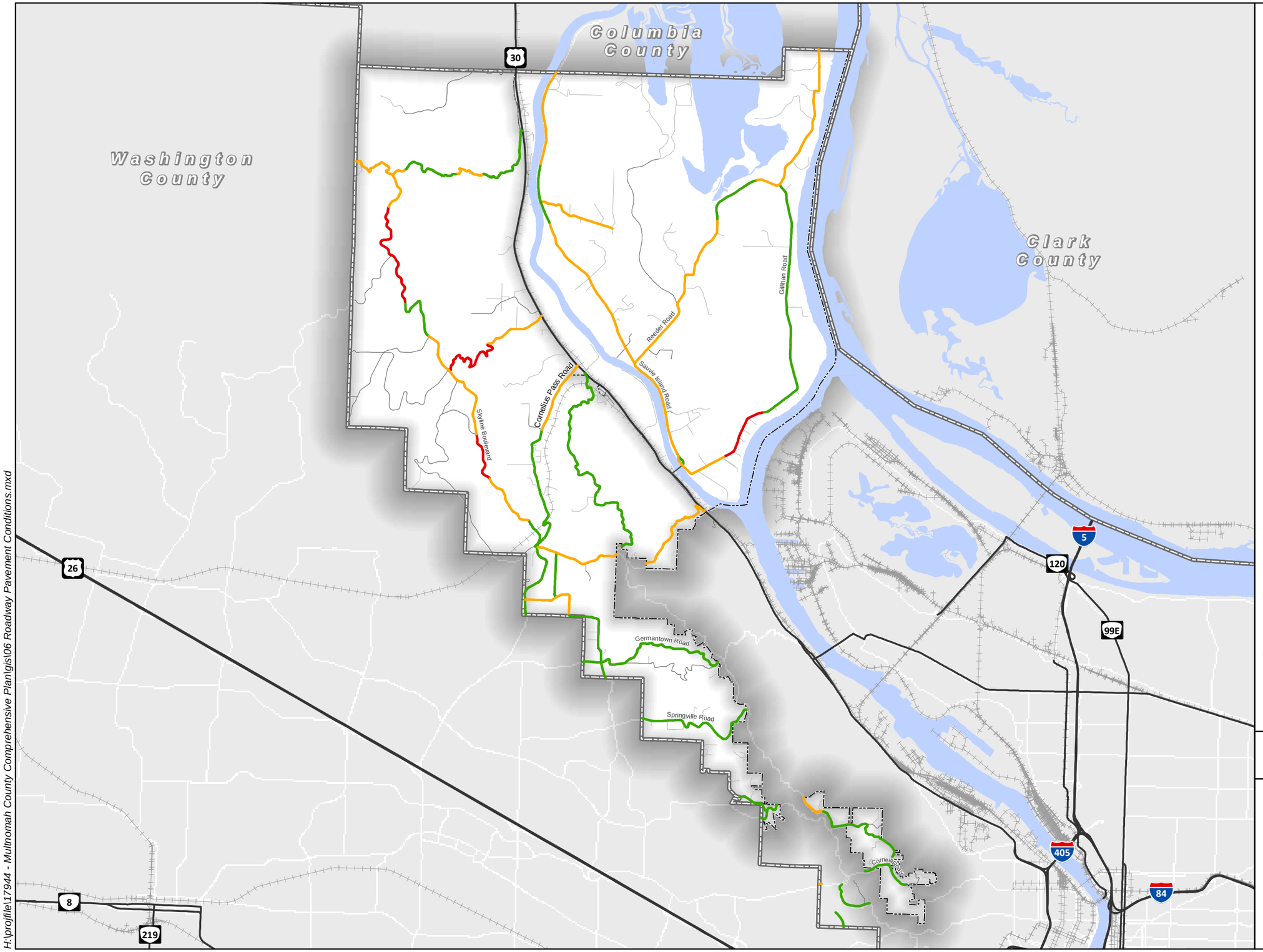
Multnomah County
Comprehensive Plan

Figure 6A

Roadway Pavement Conditions



Current Pavement Conditions Index

- <50 (does not meet county standard)
- 50 - 70 (acceptable for rural roads)
- >70 (meets county standard)
- Plan Areas
- County Boundaries

0 0.5 1 2 Miles

Prepared By:
Kittelson & Associates, Inc.

Date:
6/8/2015

Coordinate System:
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Multnomah County
Comprehensive Plan

Figure 6B

Roadway Pavement Conditions

Clark County

Skamania County

Hood River County

Clackamas County

Marine Drive
223rd Avenue
Halsey Street
Glisan Street
257th Kane Drive
Stark Street
Woodard Road
Hurlburt Road
Evans Road
Blower Road
Larch Mountain Road
Troutdale Road
Division Drive
302nd Avenue
Orbow Drive
Orient Drive
Arata Road
Bluff Road
Dodge Park Boulevard
Lusted Road
Gordon Creek Road

84
30
212
224
211
26

Current Pavement Conditions Index

- <50 (does not meet county standard)
- 50 - 70 (acceptable for rural roads)
- >70 (meets county standard)
- Plan Areas
- County Boundaries

0 1 2 4 Miles

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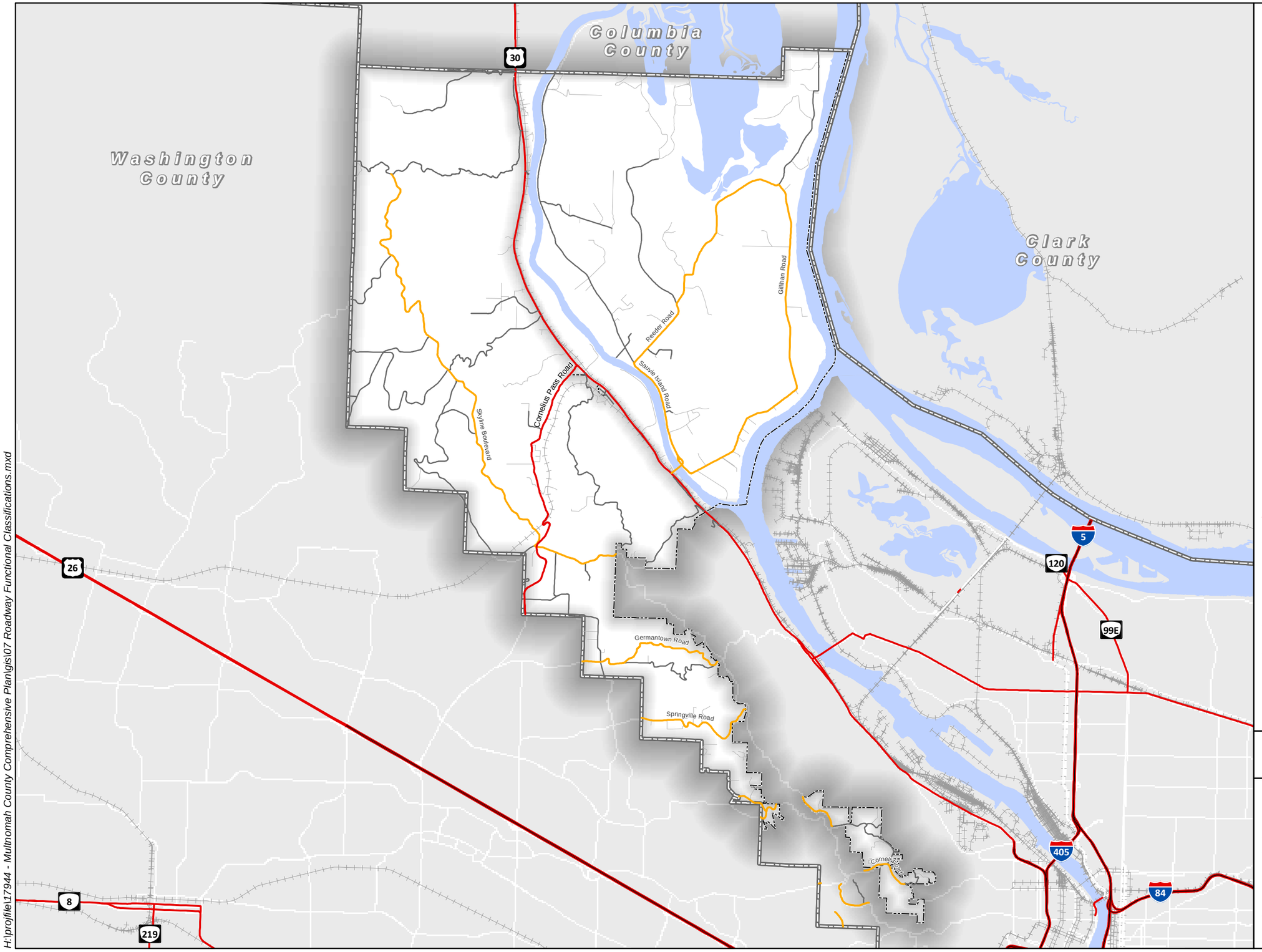
Multnomah County
Comprehensive Plan

Figure 7A

Roadway Functional Classifications



Roadway Functional Classification (MultCo)

- Intersate / Expressway
- Arterials
- Collectors
- Local
- Local (not maintained by county)
- Railroad (ODOT)
- Plan Areas
- County Boundaries

0 0.5 1 2 Miles

Prepared By:
Kittelson & Associates, Inc.

Date:
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H:\projfile\17944 - Multnomah County Comprehensive Plan\gis\07 Roadway Functional Classifications.mxd

Multnomah County

Comprehensive Plan

Figure 7B

Roadway Functional Classifications

Clark County

Skamania County

Hood River County

Clackamas County

Marine Drive
Halsey Street
Glisan Street
Stark Street
Woodard Road
Hurlburt Road
Division Drive
Orient Drive
Bluff Road
Dodge Park Boulevard
Lusted Road
Oxbow Drive
Gordon Creek Road
Latch Mountain Road
Blower Road
Evans Road
Fairview Road
Troutdale Road
257th/Kane Drive
223rd Avenue
302nd Avenue

84
30
212
224
211
26

Roadway Functional Classification (MultCo)

- Intersate / Expressway
- Arterials
- Collectors
- Local
- Local (not maintained by county)
- Railroad (ODOT)
- Plan Areas
- County Boundaries

0 1 2 4 Miles

Prepared By:
Kittelson & Associates, Inc.

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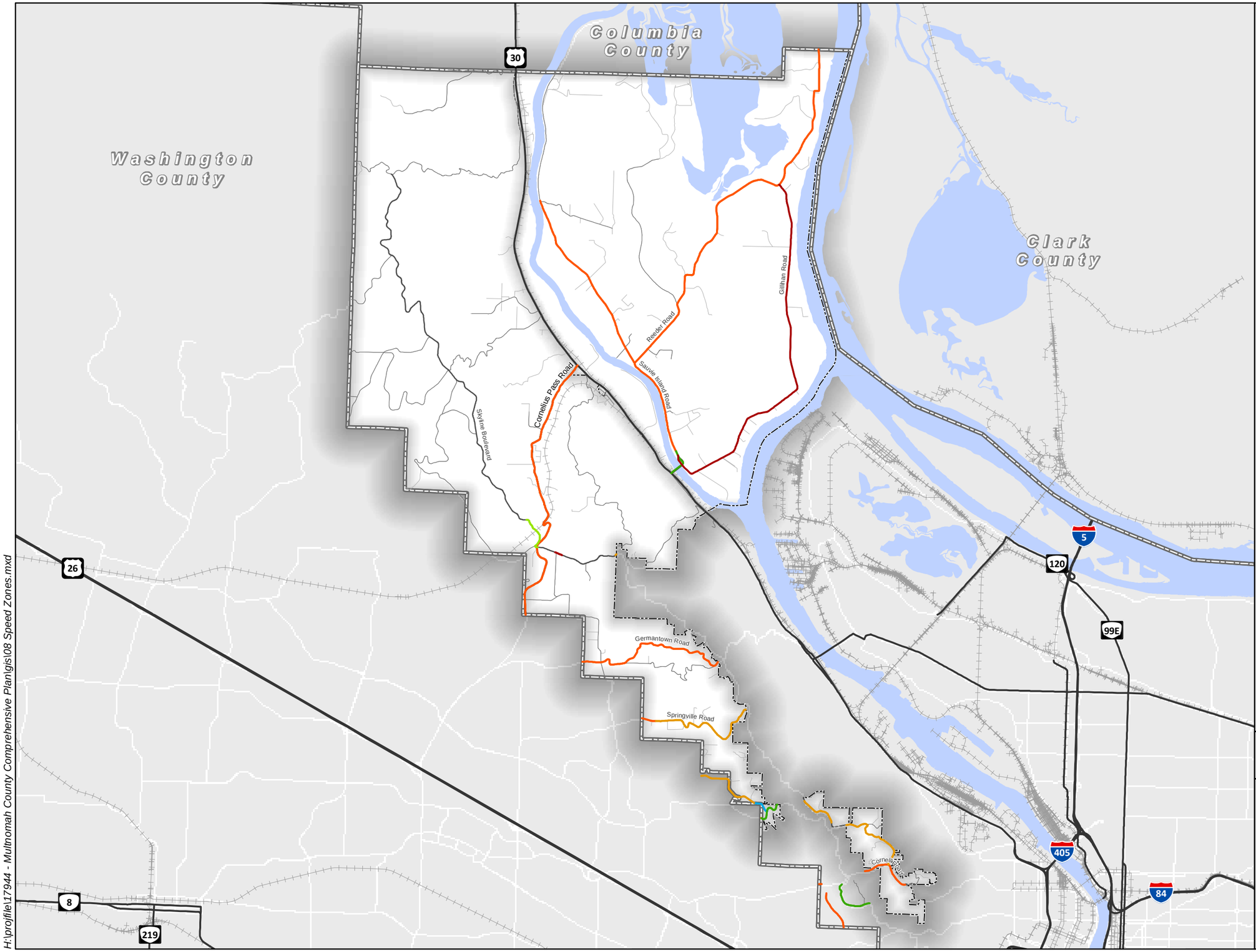

Multnomah County Comprehensive Plan

Figure 8A

Speed Zones

Speed Zones MPH

- 20
- 25
- 30
- 35
- 40
- 45
- 55

Plan Areas

County Boundaries

0 0.5 1 2 Miles

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Multnomah County
Comprehensive Plan

Figure 8B
Speed Zones

Clark County
Skamania County
Hood River County
Clackamas County

Marine Drive
223rd Avenue
Halsey Street
Glisan Street
257th/Kane Drive
Stark Street
Troutdale Road
Division Drive
302nd Avenue
Orient Drive
Arrow Road
Bluff Road
Woodard Road
Evans Road
Hurlburt Road
Oxbow Drive
Dodge Park Boulevard
Lusted Road
Gordon Creek Road
Larch Mountain Road
Blower Road

84
30
212
224
211
26

Speed Zones MPH
- 20
- 25
- 30
- 35
- 40
- 45
- 55

Plan Areas
County Boundaries

0 1 2 4 Miles

Prepared By:
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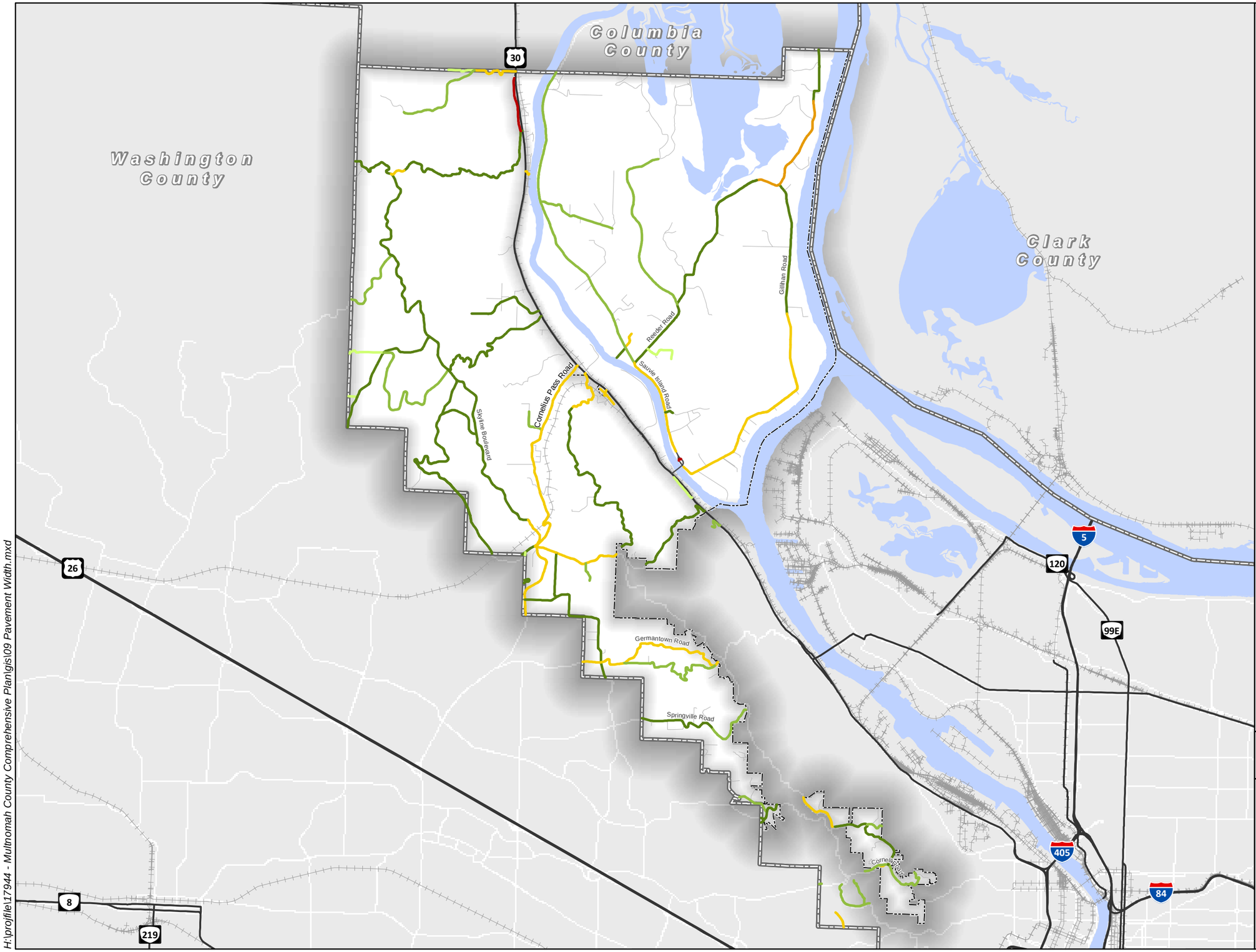

Multnomah County
Comprehensive Plan

Figure 9A
Pavement Width

Pavement Widths
- 10 - 17 ft
- 18 - 21 ft
- 22 - 23 ft
- 24 - 25 ft
- 26 - 28 ft
- 30 - 38 ft
- Plan
- County Boundaries

0 0.5 1 2 Miles

Prepared By:
Kittelson & Associates, Inc.

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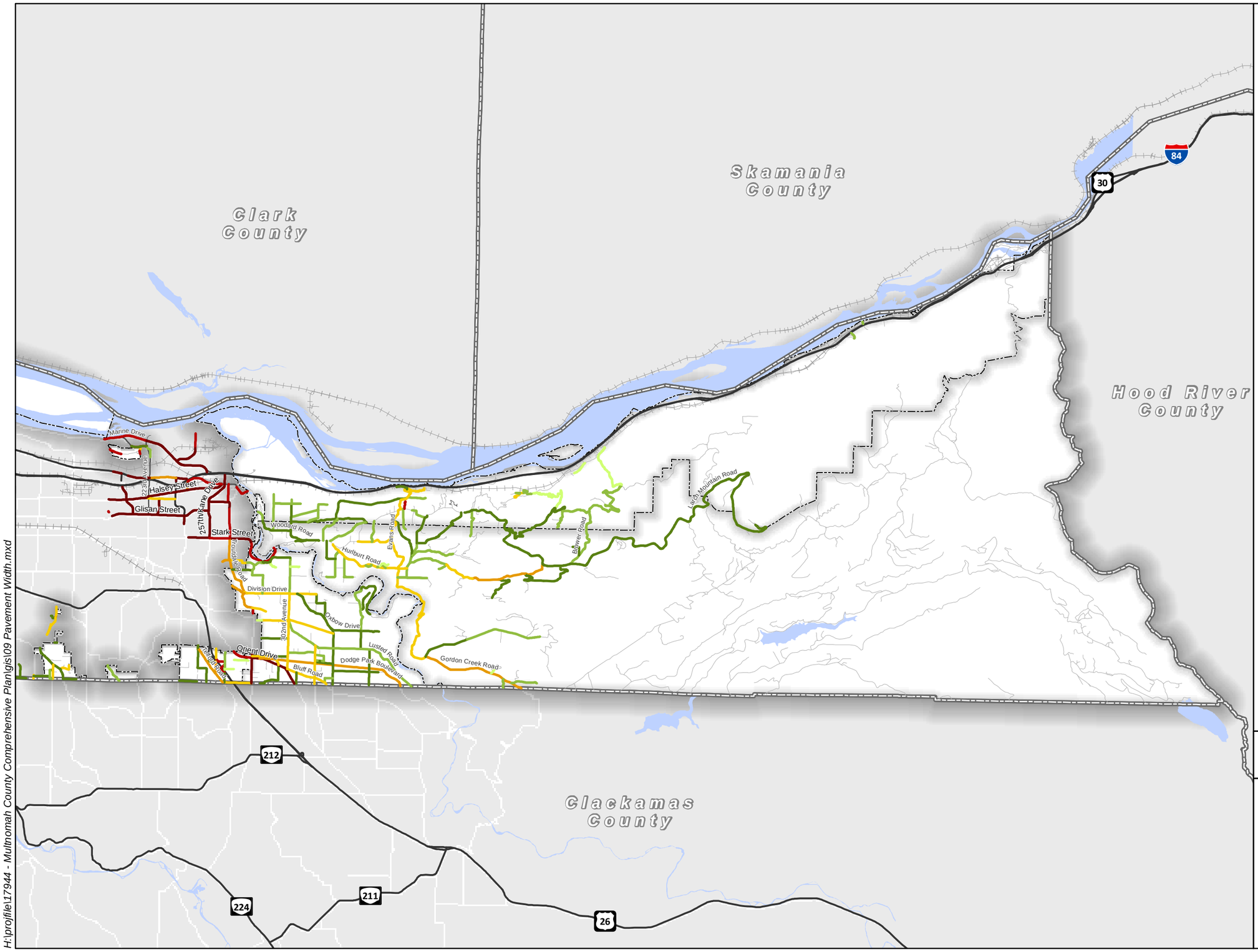

Multnomah County
Comprehensive Plan

Figure 9B
Pavement Width

Pavement Widths
- 10 - 17 ft
- 18 - 21 ft
- 22 - 23 ft
- 24 - 25 ft
- 26 - 28 ft
- 30 - 38 ft
- >39 ft

Plan

County Boundaries

0 1 2 4 Miles

Prepared By:
Kittelson & Associates, Inc.

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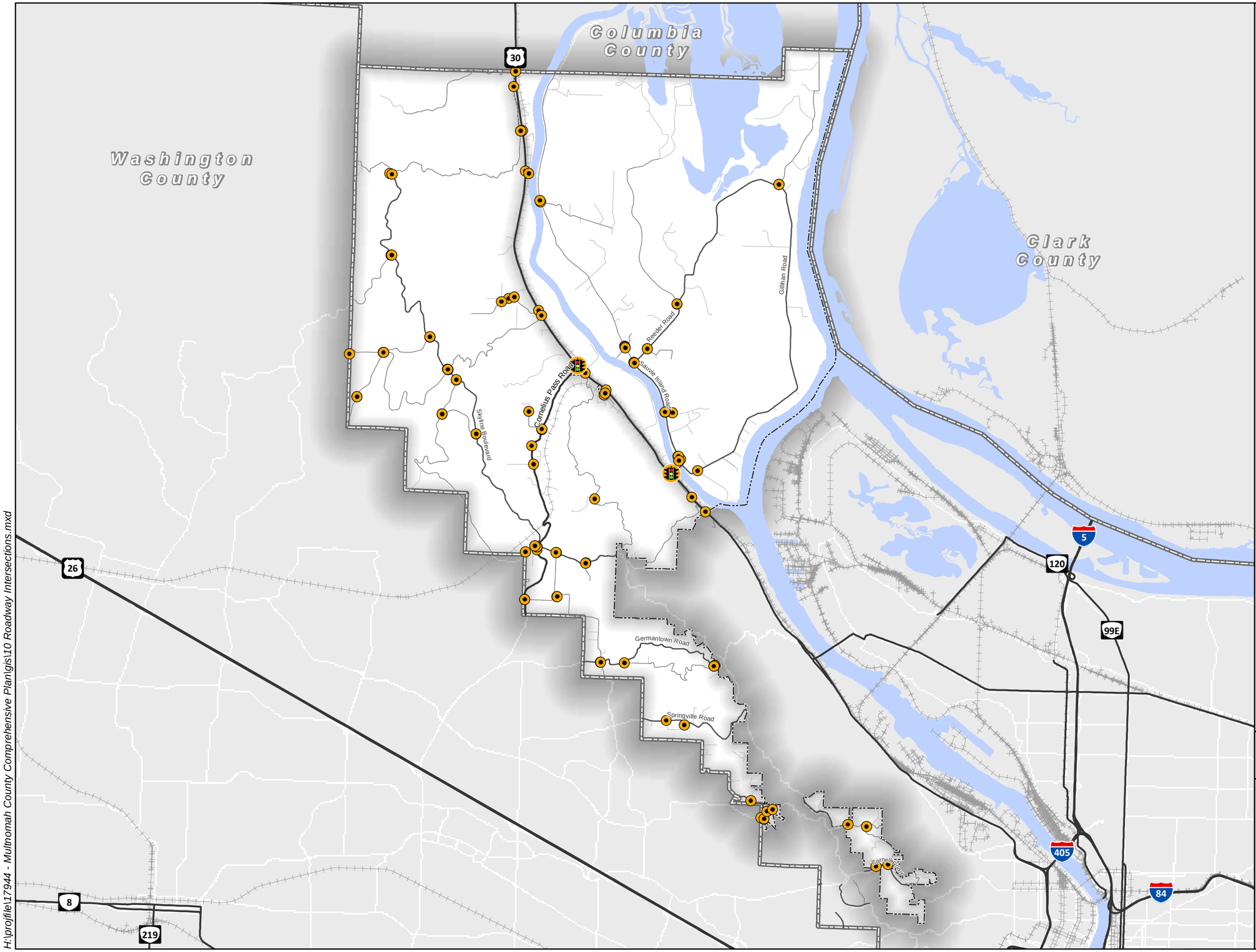

Multnomah County
Comprehensive Plan

Figure 10A

Roadway Intersections

Prepared By:
Kittelson & Associates, Inc.

Date:
6/8/2015

Coordinate System:
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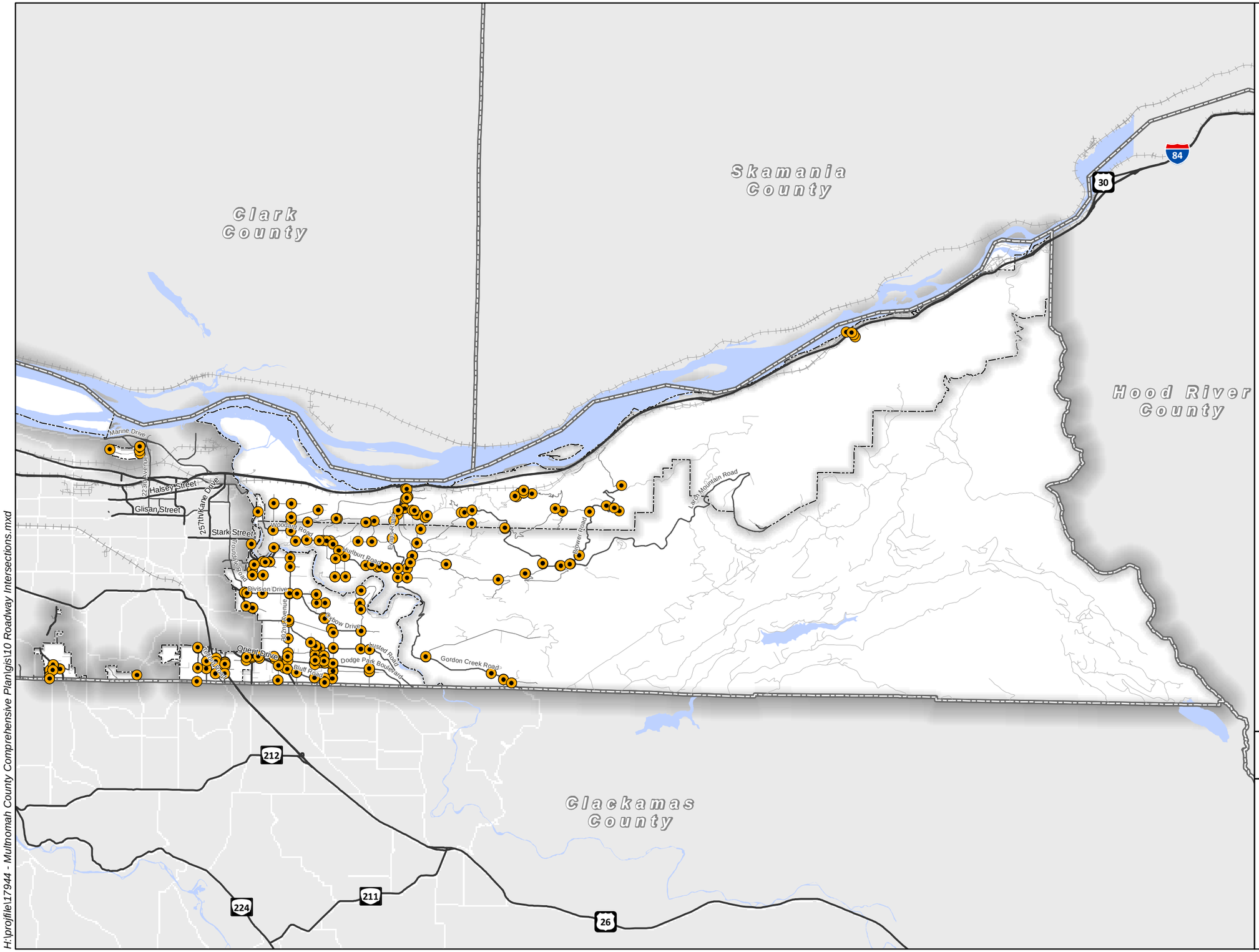
Multnomah County
Comprehensive Plan

Figure 10B

Roadway Intersections



Non-Signalized Intersection

Rural Plan Areas

County Boundaries

0 1 2 4 Miles

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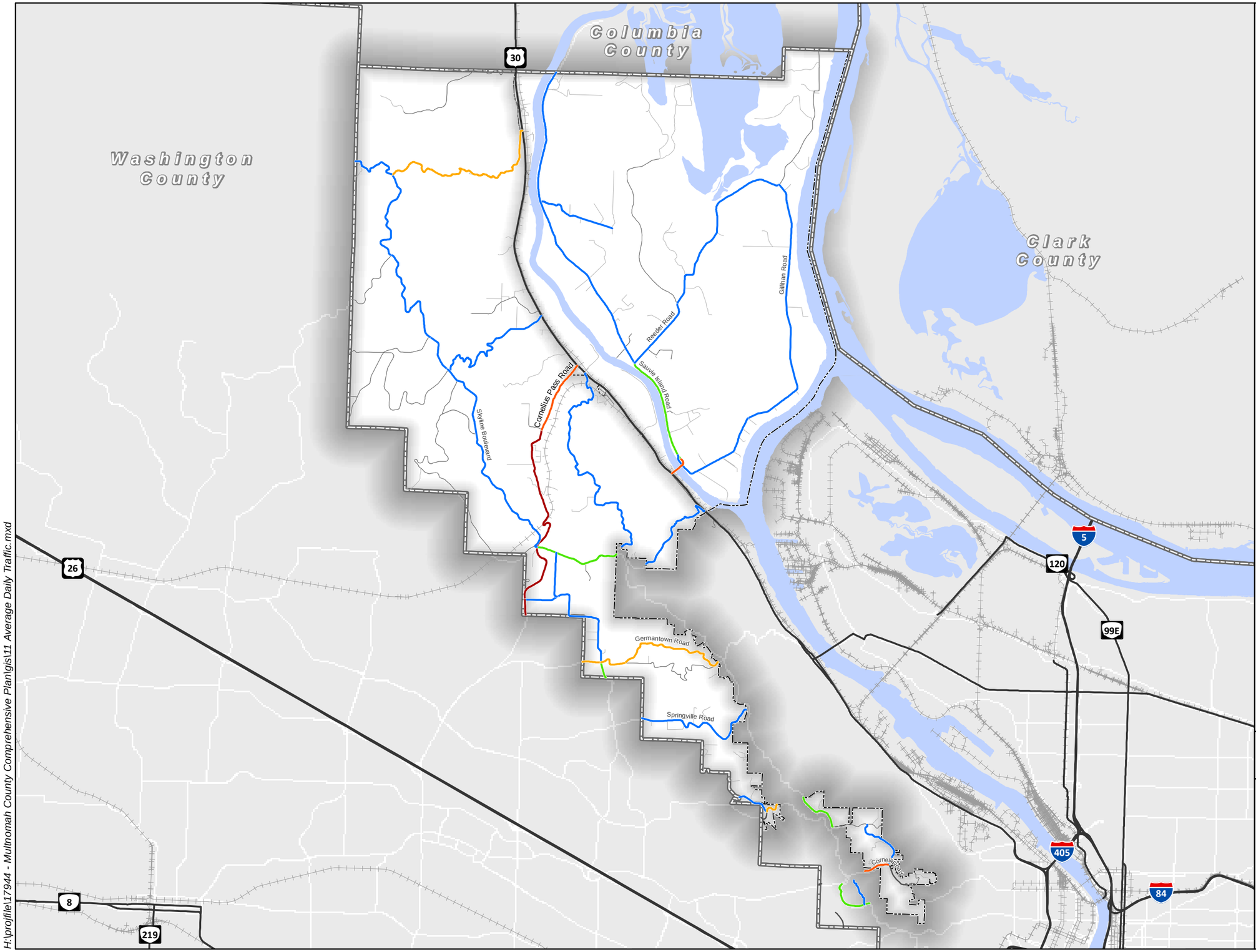

Multnomah County
Comprehensive Plan

Figure 11A
Average Daily Traffic

Average Daliy Traffic (records from 2006 to 2014)

- <1,5000
- 1,500 - 3,000
- 3,001 - 5,000
- 5,001 - 10,000
- >10,000
- Plan Areas
- County Boundaries

0 0.5 1 2 Miles

Prepared By:
Kittelson & Associates, Inc.

Date:
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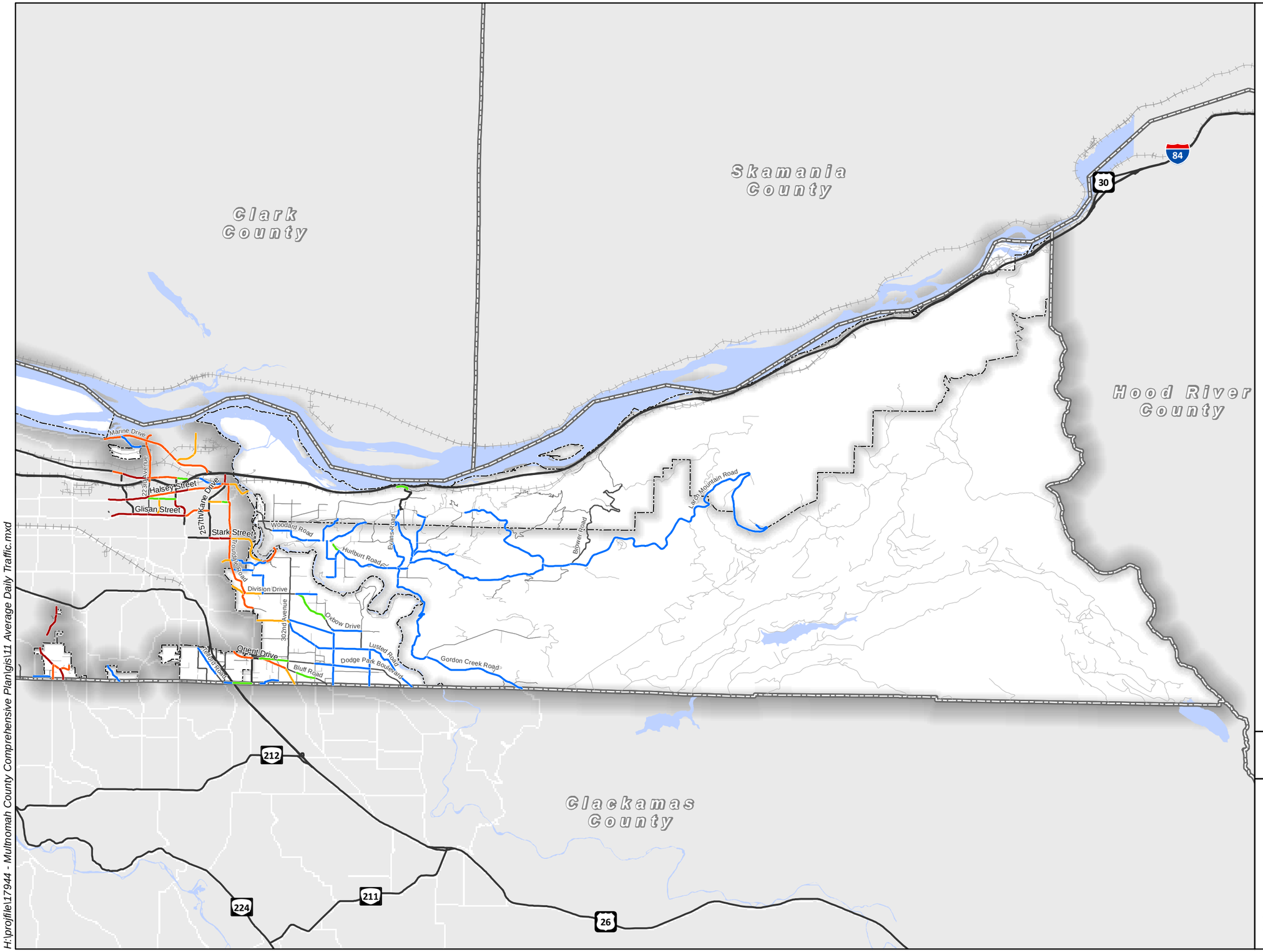
H:\profile\17944 - Multnomah County Comprehensive Plan\gis\11 Average Daily Traffic.mxd



Multnomah County Comprehensive Plan

Figure 11B

Average Daily Traffic

Average Daliy Traffic (records from 2006 to 2014)

- <1,5000
- 1,500 - 3,000
- 3,001 - 5,000
- 5,001 - 10,000
- >10,000
- Plan Areas
- County Boundaries

0 1 2 4 Miles

Prepared By:
Kittelson & Associates, Inc.

Date:
6/8/2015

Coordinate System:
NAD 1983 HARN State Plane Oregon North FIPS 3601

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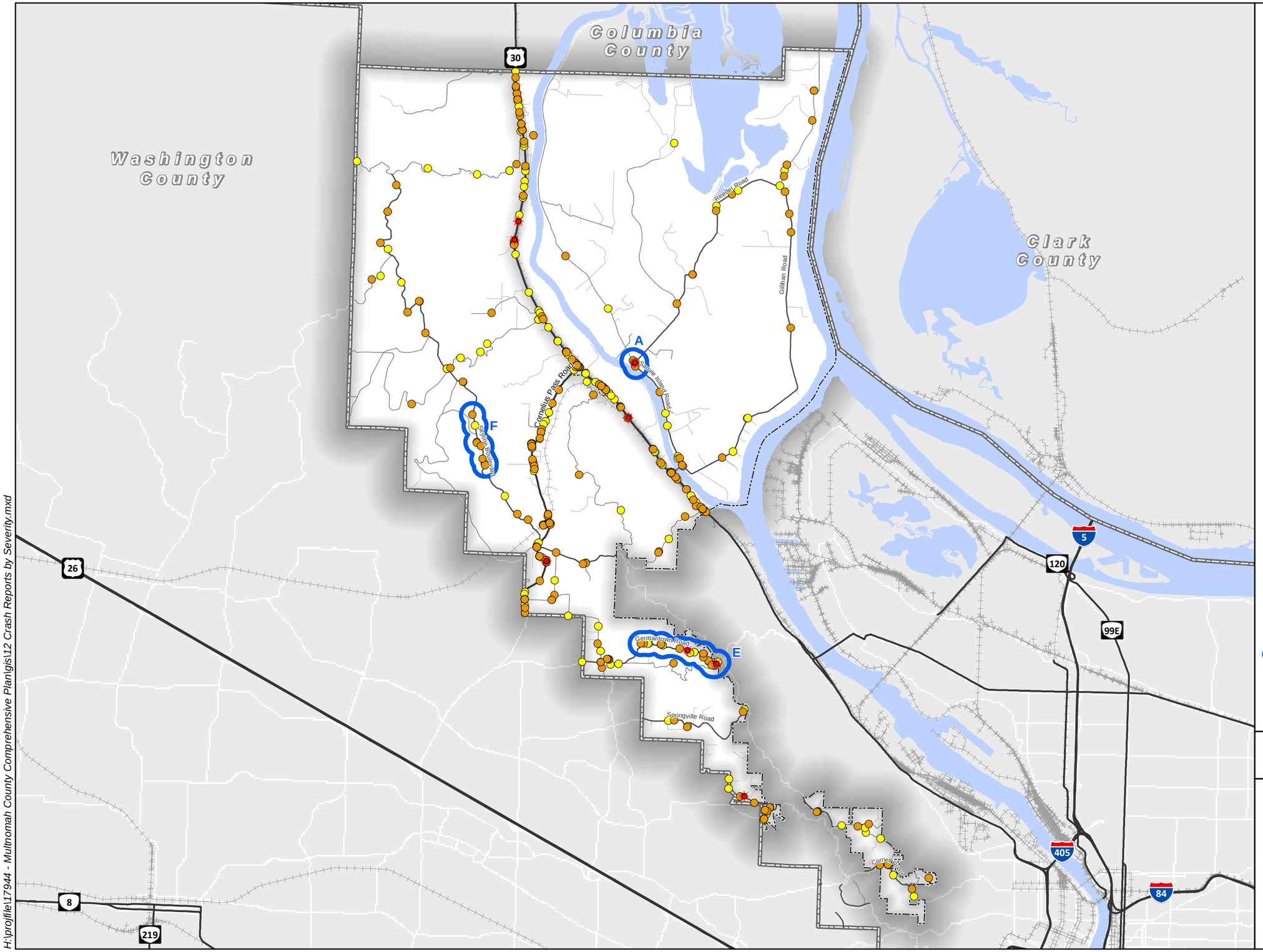

H:\profile\17944 - Multnomah County Comprehensive Plan\gis\12 Crash Reports by Severity.mxd

Multnomah County
Comprehensive Plan

Figure 12A

Crash Reports by Severity

Reported Crashes by Severity from 1/1/2009 thru 1/3/2014

- Fatal crash
- Non-fatal injury crash
- Property damage only crash (PDO)
- Crash Analysis
- Plan Areas
- County Boundaries

0 0.5 1 2 Miles

Prepared By:
Kittelson & Associates, Inc.

Date:
6/8/2015

Coordinate System:
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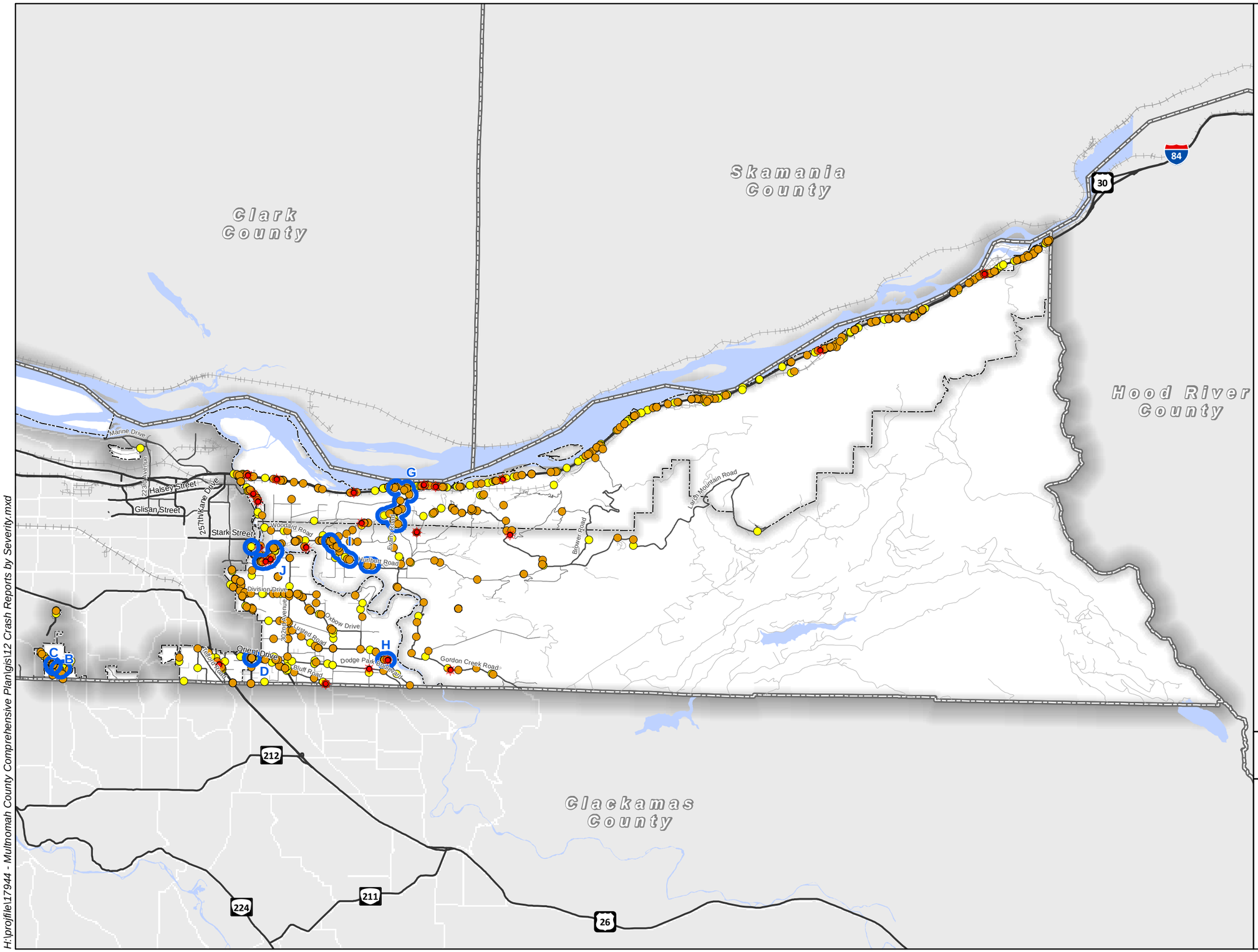

H:\projfile\17944 - Multnomah County Comprehensive Plan\gis\12 Crash Reports by Severity.mxd

Multnomah County
Comprehensive Plan

Figure 12B

Crash Reports by Severity

Reported Crashes by Severity from 1/1/2009 thru 1/3/2014

- Fatal crash
- Non-fatal injury crash
- Property damage only crash (PDO)
- Crash Analysis
- Plan Areas
- County Boundaries

0 1 2 4 Miles

Prepared By:
Kittelson & Associates, Inc.

Date:
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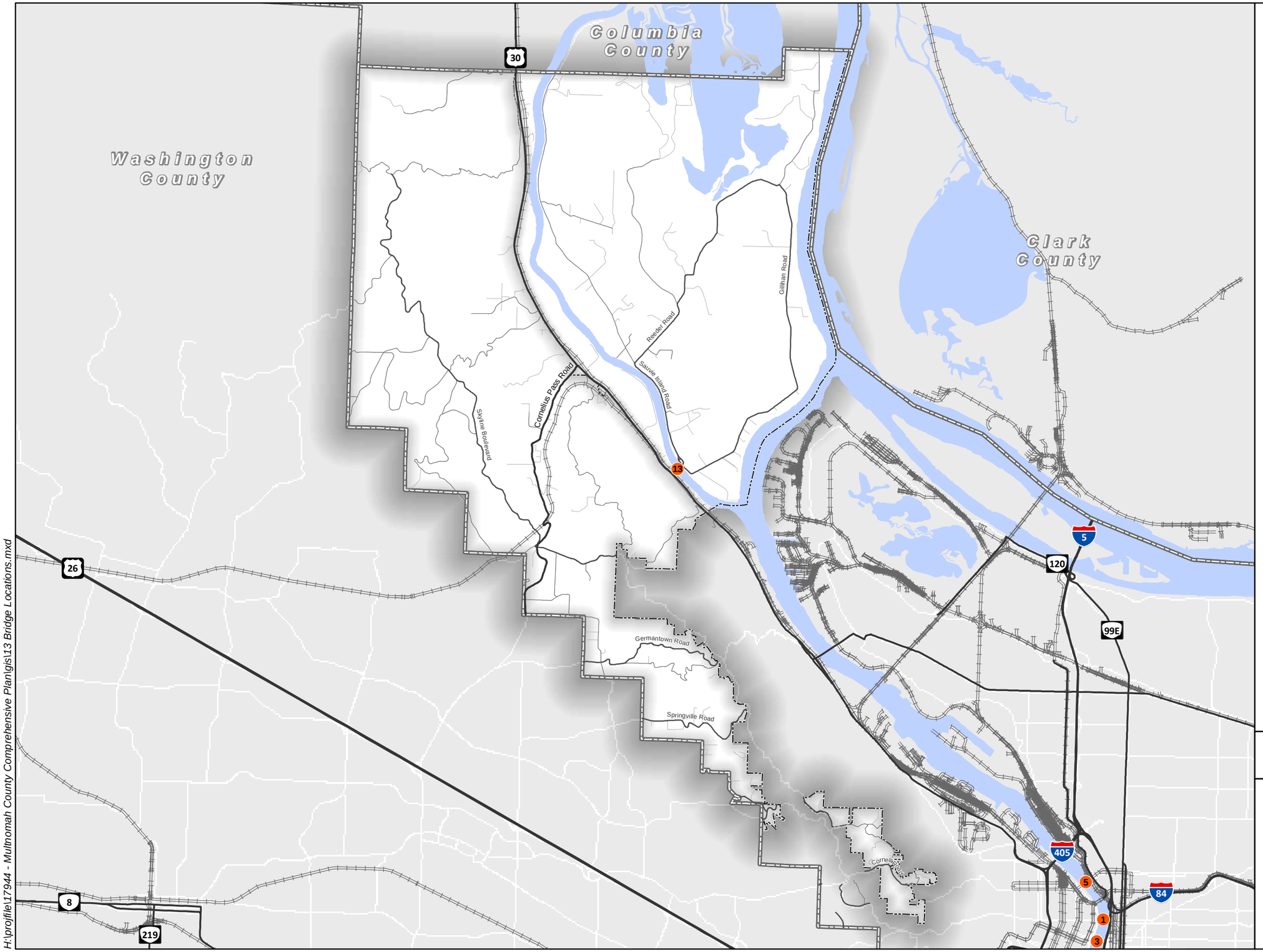

Multnomah County
Comprehensive Plan

Figure 13A

Bridge Locations

Prepared By:
Kittelson & Associates, Inc.

Date:
6/8/2015

Coordinate System:
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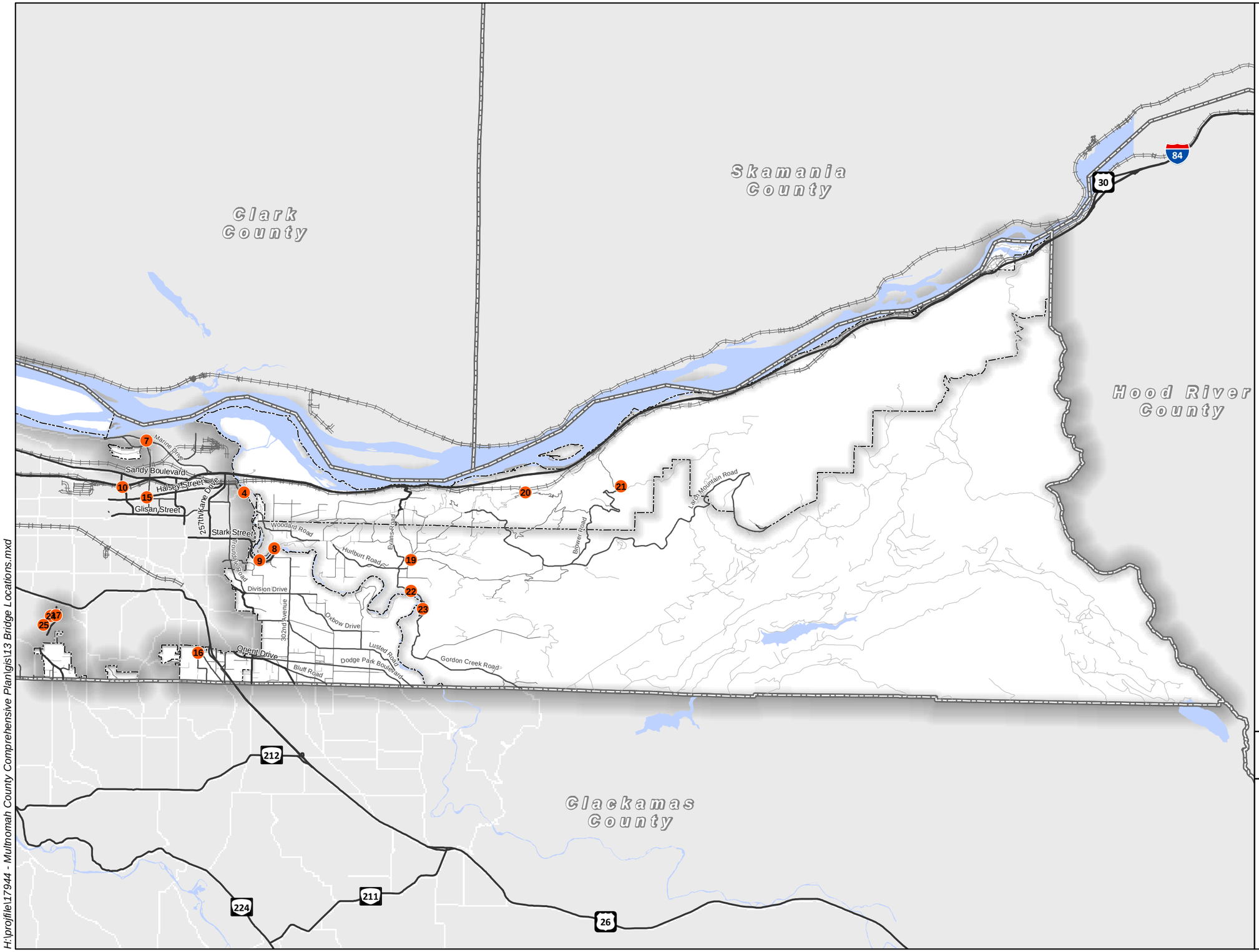
Multnomah County
Comprehensive Plan

Figure 13B
Bridge Locations



Bridge Locations
Plan Areas
County Boundaries

0 1 2 4 Miles

Prepared By:
Kittelson & Associates, Inc.

Date:
6/8/2015

Coordinate System:
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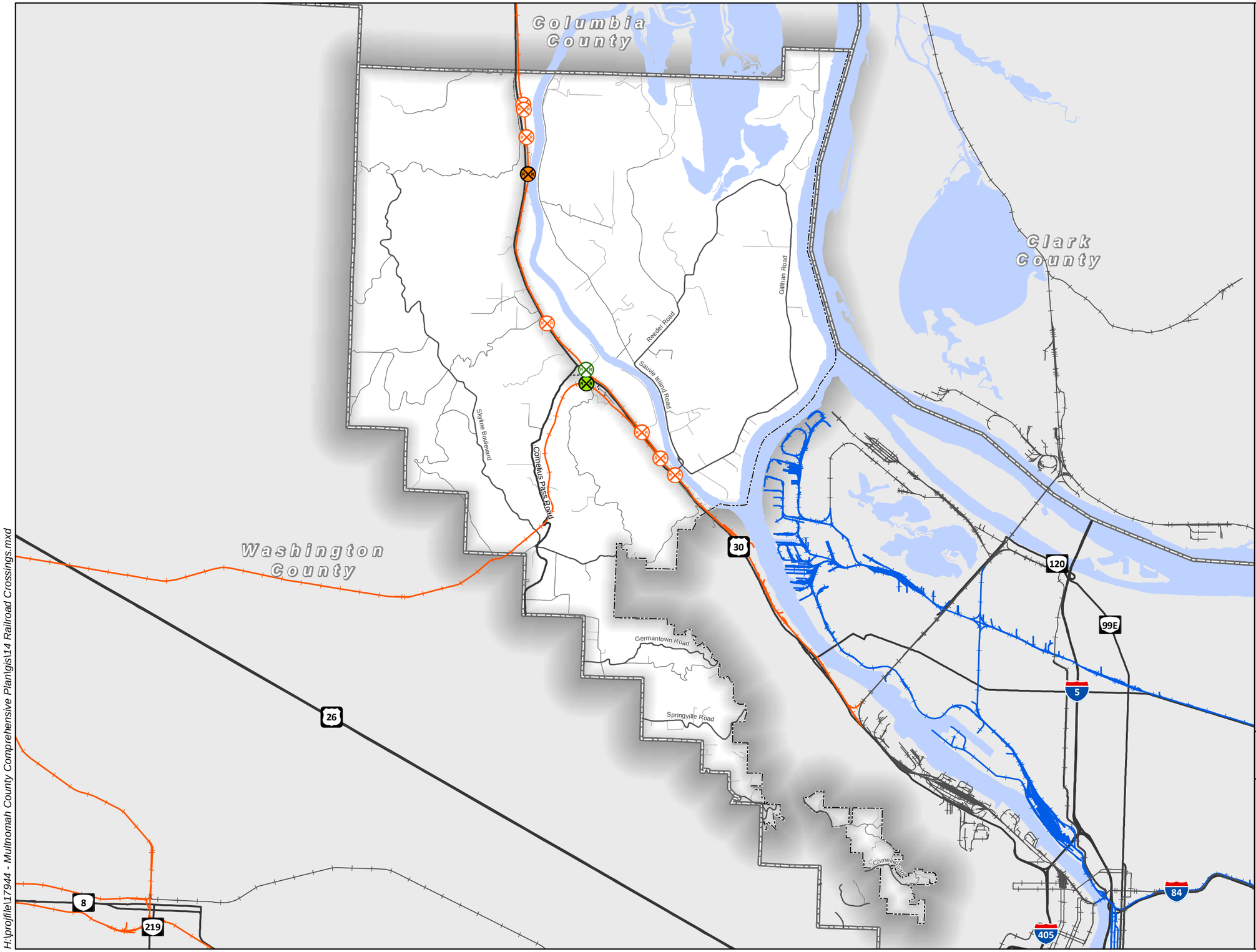

H:\profile\17944 - Multnomah County Comprehensive Plan\gis\14 Railroad Crossings.mxd

Multnomah County
Comprehensive Plan

Figure 14A
Railroad Crossings

Edit, Crossing

- Private At-Grade RR Crossing
- Private Grade-Seperated RR Crossing
- Public At-Grade RR Crossing
- Public Grade-Seperated RR Crossing

Railroad Lines

- Portland and Western
- Union Pacific
- Other Railroad Lines
- Plan Areas
- County Boundaries

0 0.5 1 2 Miles

Prepared By:
Kittelson & Associates, Inc.

Date:
6/8/2015

Coordinate System:
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Multnomah County
Comprehensive Plan

Figure 14B
Railroad Crossings

Clark County
Skamania County
Hood River County
Clackamas County

Marine Drive
223rd Avenue
Glisan Street
257th Avenue
Stark Street
Woodard Road
Evans Road
Hurlburt Road
Division Drive
Orabow Drive
302nd Avenue
Lusted Road
Dodge Park Boulevard
Bluff Road
Orient Drive
Troutdale Road
Gordon Creek Road
Larch Mountain Road
Blower Road

84
30
212
224
211
26

Edit, Crossing

- Private At-Grade RR Crossing
- Private Grade-Seperated RR Crossing
- Public At-Grade RR Crossing
- Public Grade-Seperated RR Crossing

Railroad Lines

- Portland and Western
- Union Pacific
- Other Railroad Lines
- Plan Areas
- County Boundaries

0 1 2 4 Miles

Prepared By:
Kittelson & Associates, Inc.

Date:
6/8/2015

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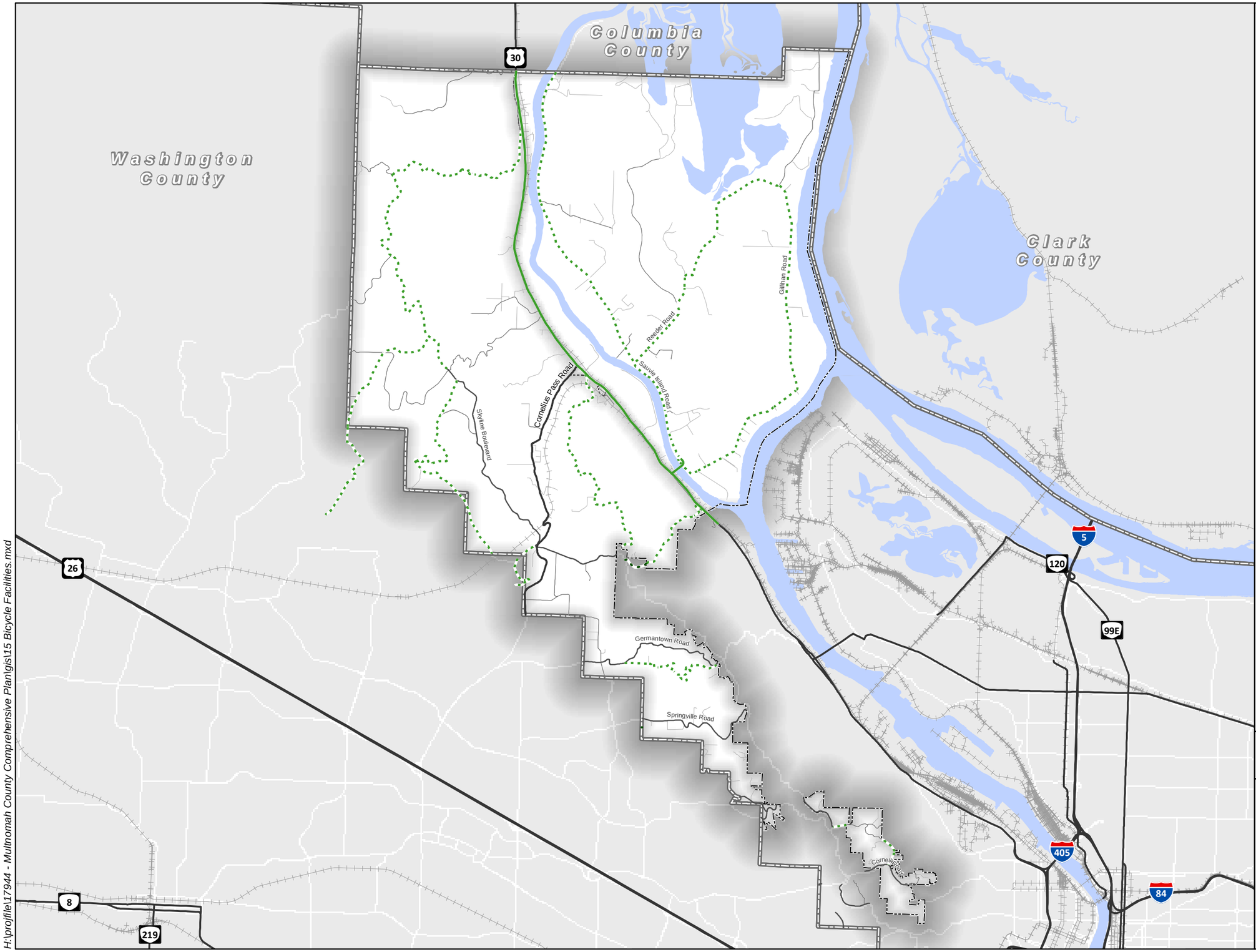

Multnomah County
Comprehensive Plan

Figure 15A
Bicycle Facilities

Bike Routes
- Established bikeway
- Bike friendly street
- Dedicated bike lane
- Helpful connection
- County Boundaries
- Plan Areas

0 0.5 1 2 Miles

Prepared By:
Kittelson & Associates, Inc.

Date:
6/8/2015

Coordinate System:
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H:\projfile\17944 - Multnomah County Comprehensive Plan\gis\15 Bicycle Facilities.mxd

Multnomah County

Comprehensive Plan

Figure 15B

Bicycle Facilities

Clark County

Skamania County

Hood River County

Clackamas County

Marine Drive

223rd Avenue

Halsey Street

Glisan Street

257th Avenue

Stark Street

Troutdale Road

Woodard Road

Evans Road

Hurlburt Road

Division Drive

302nd Avenue

Orbow Drive

Orient Drive

Lusted Road

Dodge Park Boulevard

Bluff Road

Gordon Creek Road

Larch Mountain Road

Blower Road

84

30

212

224

211

26

Bike Routes

- Established bikeway
- Bike friendly street
- Dedicated bike lane
- Helpful connection
- Local trail
- Bike with caution
- County Boundaries
- Plan Areas

0 1 2 4 Miles

Prepared By:
Kittelson & Associates, Inc.

Date:
6/8/2015

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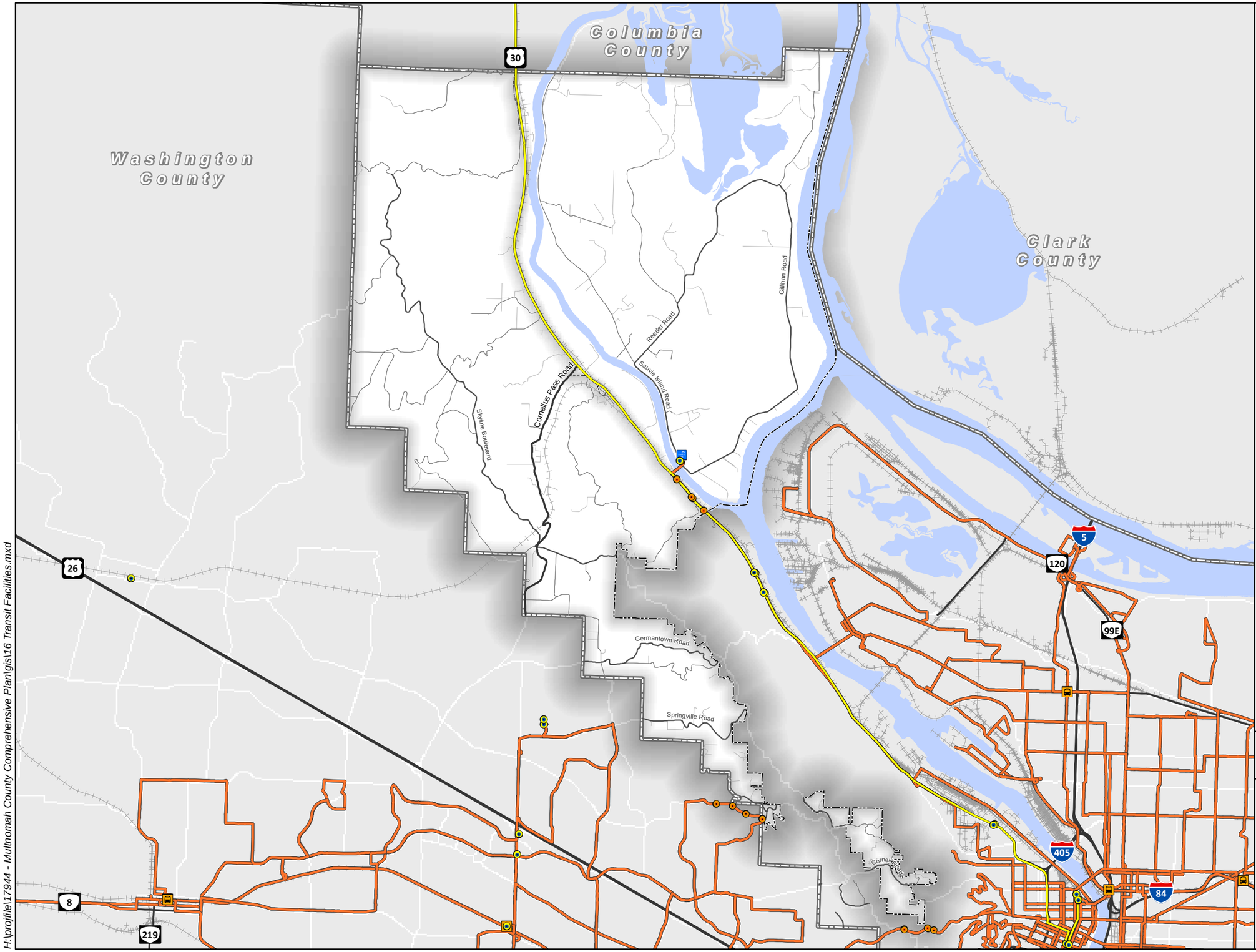

Multnomah County
Comprehensive Plan

Figure 16A
Transit Facilities

- TriMet Stops
- Columbia County Rider Stops
- Transit Centers
- Park N' Ride
- TriMet Routes
- Columbia County Rider Routes
- Plan Areas
- County Boundaries

0 0.5 1 2 Miles

Prepared By:
Kittelson & Associates, Inc.

Date:
6/8/2015

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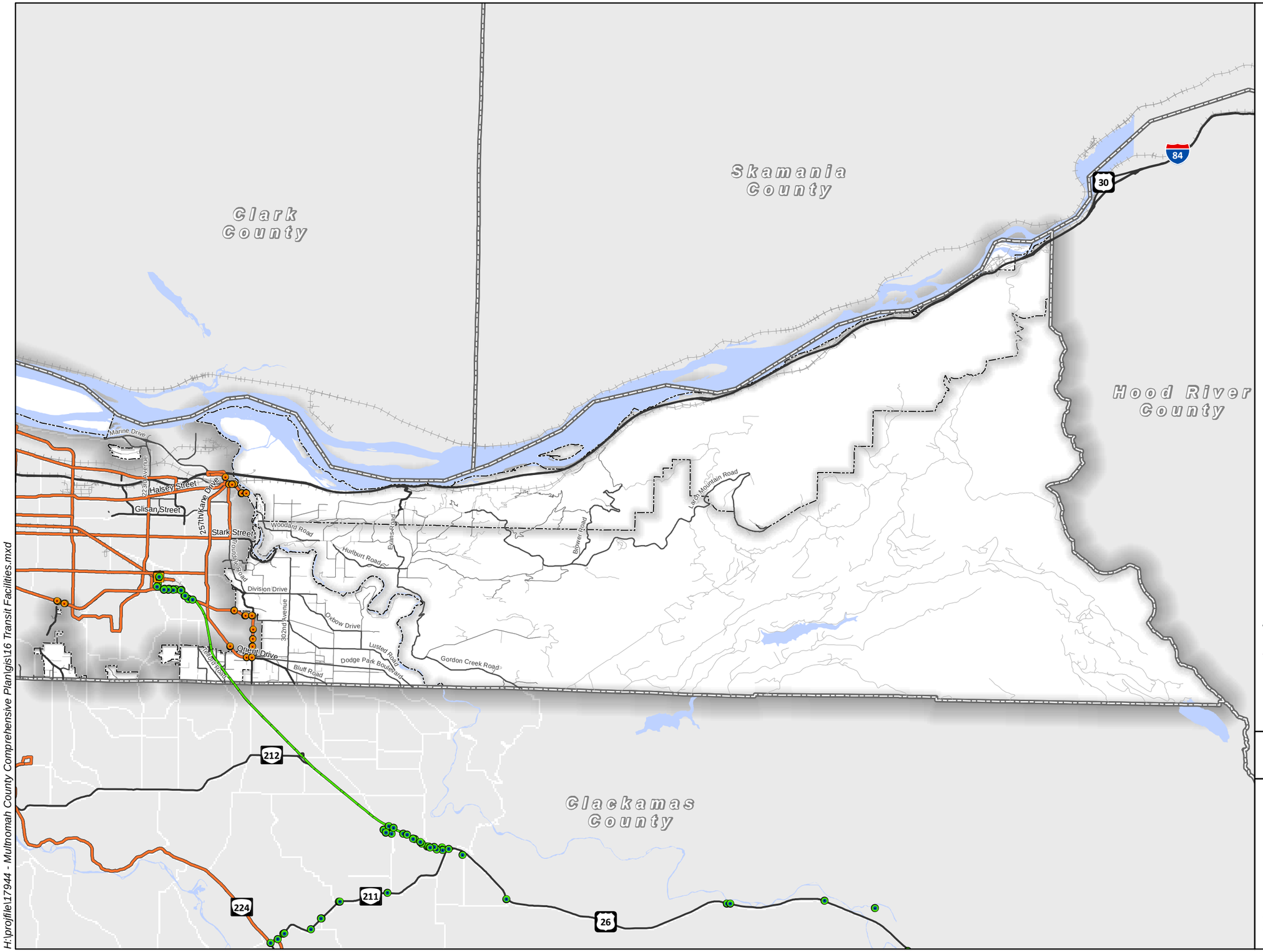
Multnomah County
Comprehensive Plan

Figure 16B
Transit Facilities



- TriMet Stops
- Sandy Area Metro Stops
- Transit Centers
- TriMet Routes
- Sandy Area Metro Routes
- Plan Areas
- County Boundaries

0 1 2 4 Miles

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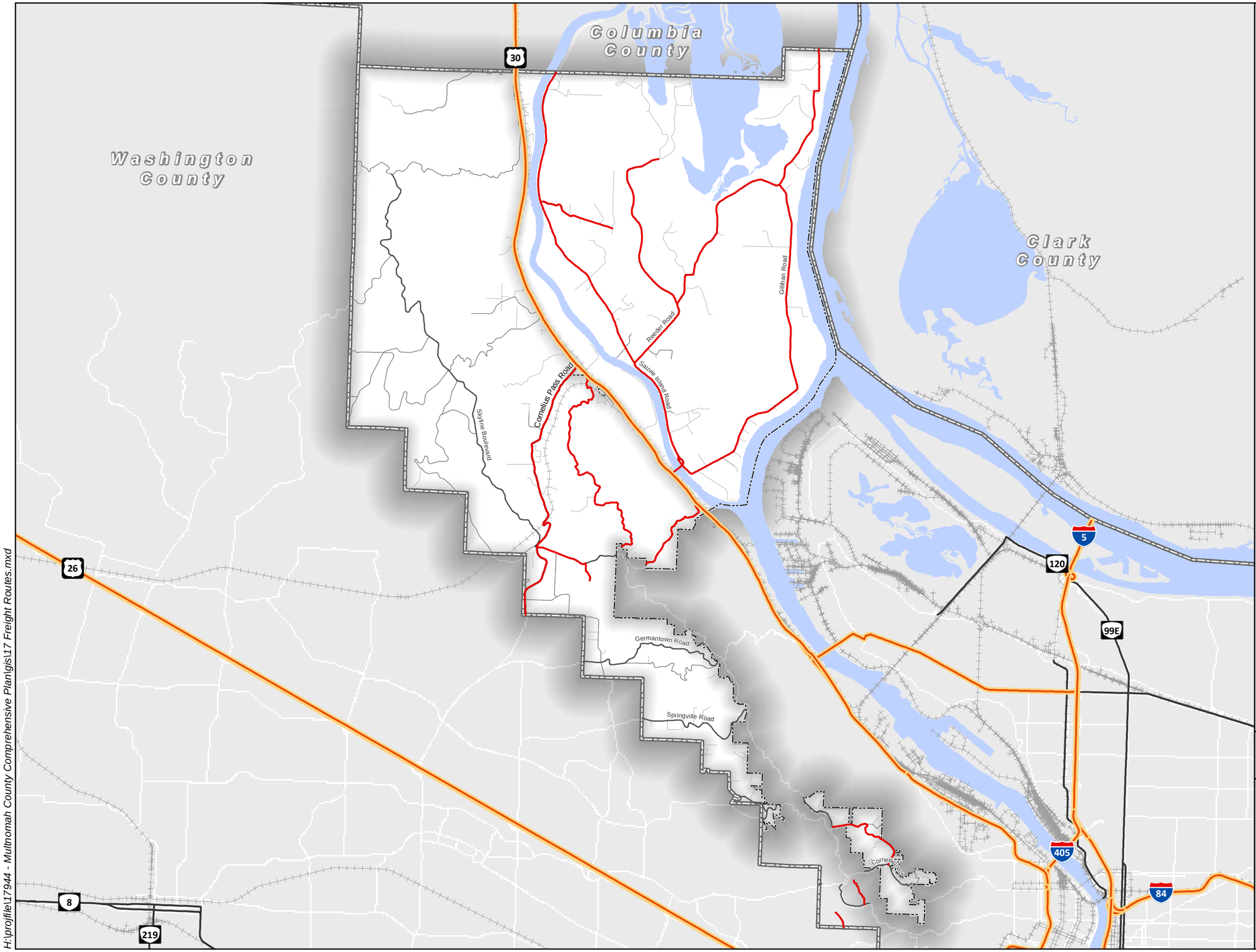

Multnomah County
Comprehensive Plan

Figure 17A

Freight Routes

Multnomah Co. Truck Routes

ODOT Freight Routes

Plan Areas

County Boundaries

0 0.5 1 2 Miles

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6/8/2015

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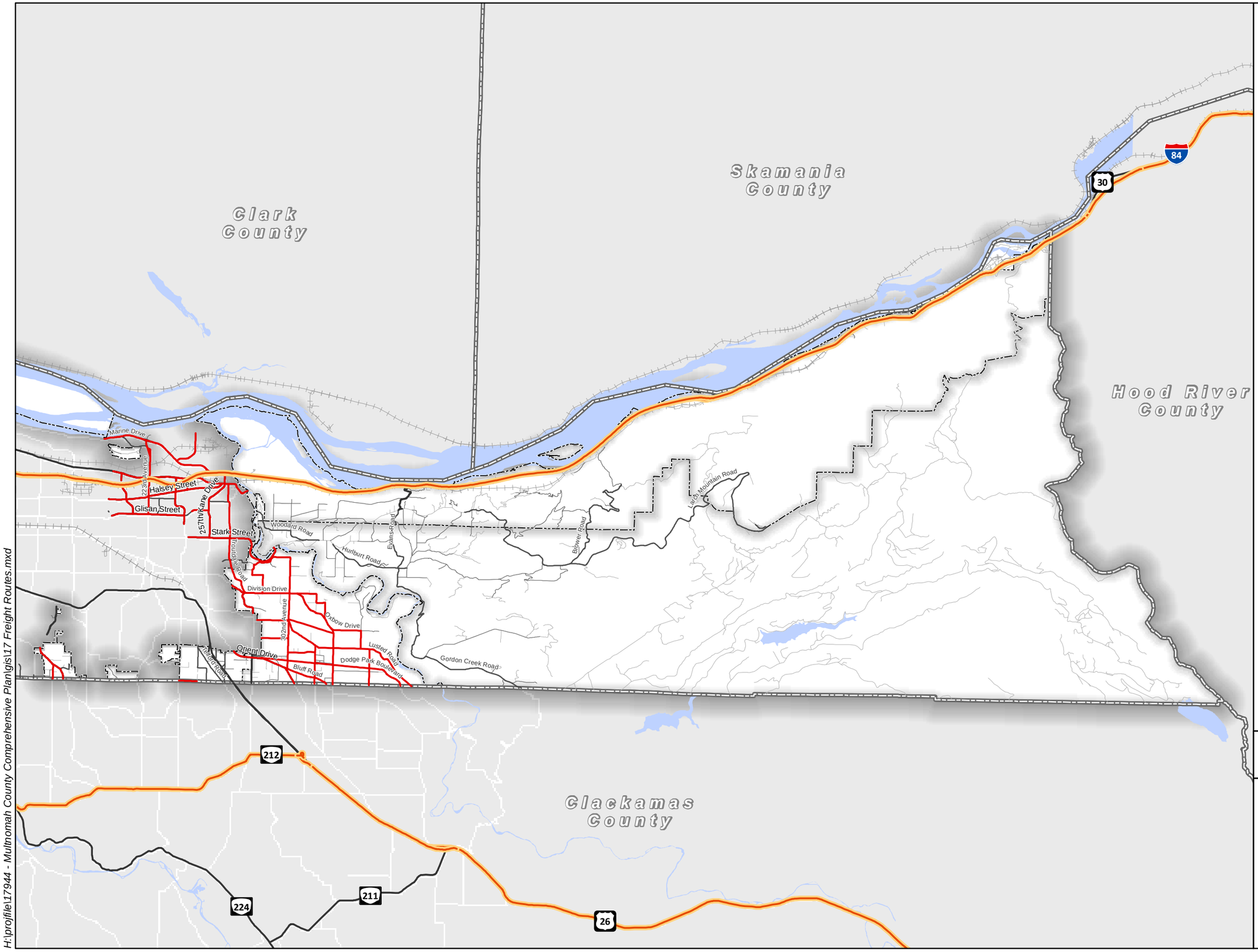
H:\profile\17944 - Multnomah County Comprehensive Plan\gis\17 Freight Routes.mxd

Multnomah County
Comprehensive Plan

Figure 17B
Freight Routes



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Multnomah County
Comprehensive Plan

Figure 18A

Employment Change

Columbia County

Washington County

Clark County

115

177

835

84

113

7

8

15

81

88

79

125

520

610

Cornelius Pass Road

Skyline Boulevard

Sauvie Island Road

Germantown Road

Springville Road

Reeder Road

Gillihan Road

30

26

8

219

5

405

99E

120

84

Change in Empolyees by TAZ from 2010 to 2040

- 6 - 40
- 41 - 88
- 89 - 177
- 178 - 610
- 611 - 1094
- Rural Plan Areas
- County Boundaries

0 0.5 1 2 Miles

Prepared By:
Kittelson & Associates, Inc.

Date:
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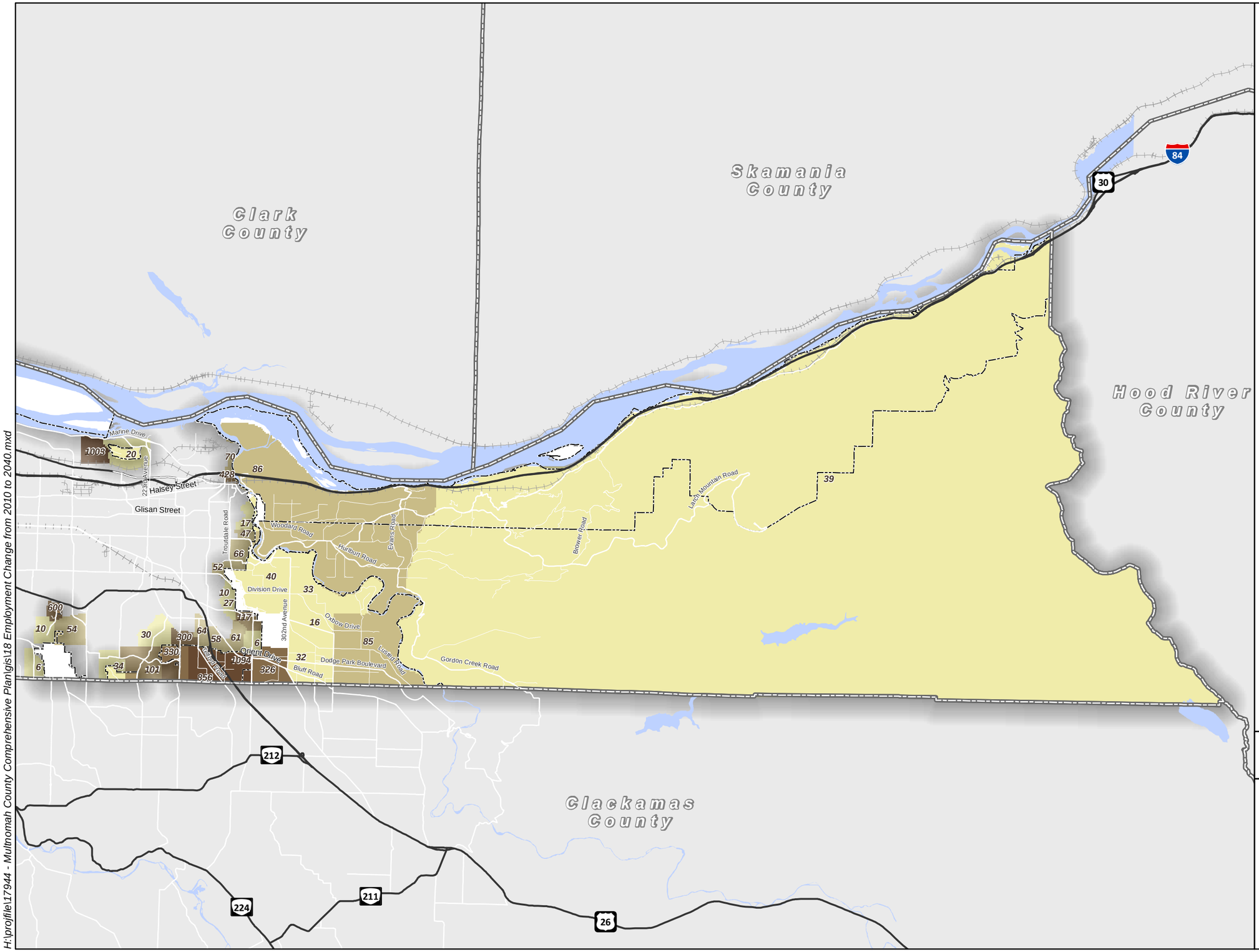

H:\projfile\17944 - Multnomah County Comprehensive Plan\gis\18 Employment Change from 2010 to 2040.mxd

Multnomah County
Comprehensive Plan

Figure 18B
Employment Change

Change in Empolyees by TAZ from 2010 to 2040

- 6 - 40
- 41 - 88
- 89 - 177
- 178 - 610
- 611 - 1094
- Rural Plan Areas
- County Boundaries

0 1 2 4 Miles

Prepared By:
Kittelson & Associates, Inc.

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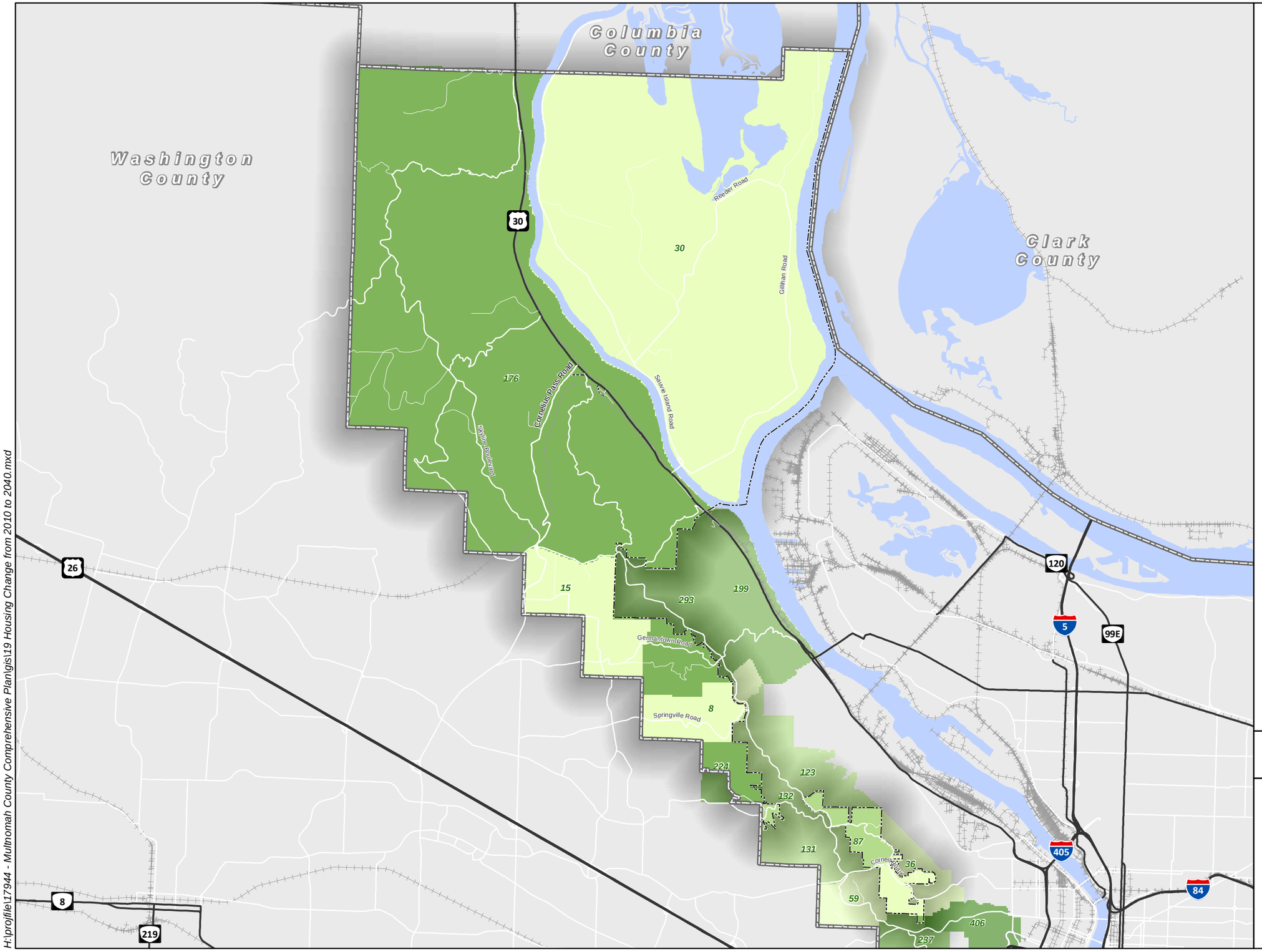

H:\projfile\17944 - Multnomah County Comprehensive Plan\gis\19 Housing Change from 2010 to 2040.mxd

Multnomah County
Comprehensive Plan

Figure 19A

Houshold Change

Change in Households by TAZ from 2010 to 2040

- -32 - 67
- 68 - 151
- 152 - 293
- 294 - 751
- 752 - 1319
- Rural Plan Areas
- County Boundaries

Miles
0 0.5 1 2

Prepared By:
Kittelson & Associates, Inc.

Date:
6/8/2015

Coordinate System:
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Multnomah County
Comprehensive Plan

Figure 19B

Houshold Change

Clark County

Skamania County

Hood River County

Clackamas County

Marine Drive
223rd Avenue
Halsey Street
Glisan Street
257th/Kane Drive
Troutdale Road
Woodard Road
Hurlburt Road
Evans Road
Brower Road
Larch Mountain Road
Division Drive
Oxbow Drive
Lusted Road
Dodge Park Boulevard
Bluff Road
Gordon Creek Road
Orient Drive

84
30
212
224
211
26

Change in Households by TAZ from 2010 to 2040

- -32 - 67
- 68 - 151
- 152 - 293
- 294 - 751
- 752 - 1319
- Rural Plan Areas
- County Boundaries

0 1 2 4 Miles

Prepared By:
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6/8/2015

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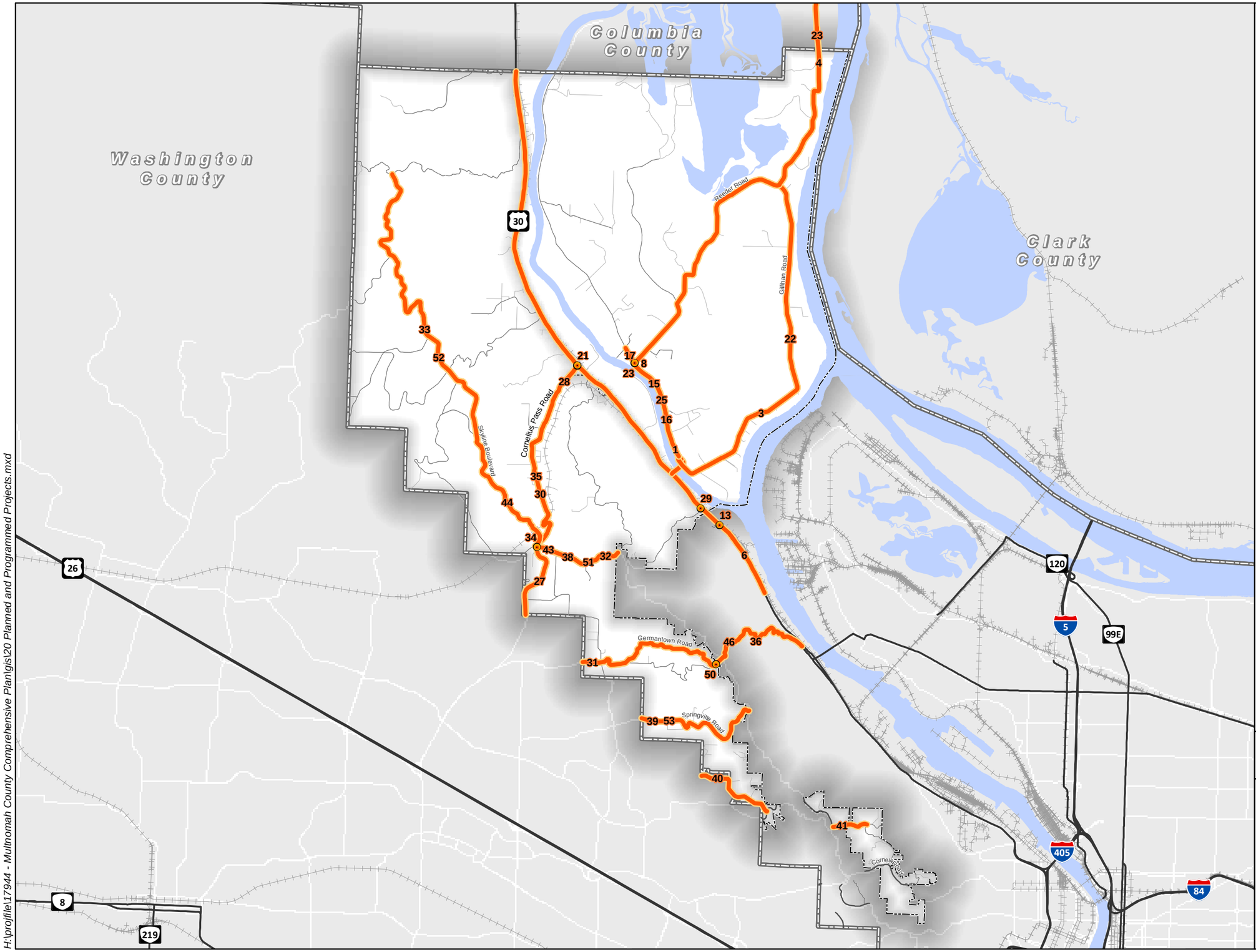

Multnomah County
Comprehensive Plan

Figure 20A

Planned and Programmed Projects

Project Points

Project Segments

Plan Areas

County Boundaries

0 0.5 1 2 Miles

Prepared By:
Kittelson & Associates, Inc.

Date:
6/8/2015

Coordinate System:
NAD 1983 HARN State Plane Oregon North FIPS 3601

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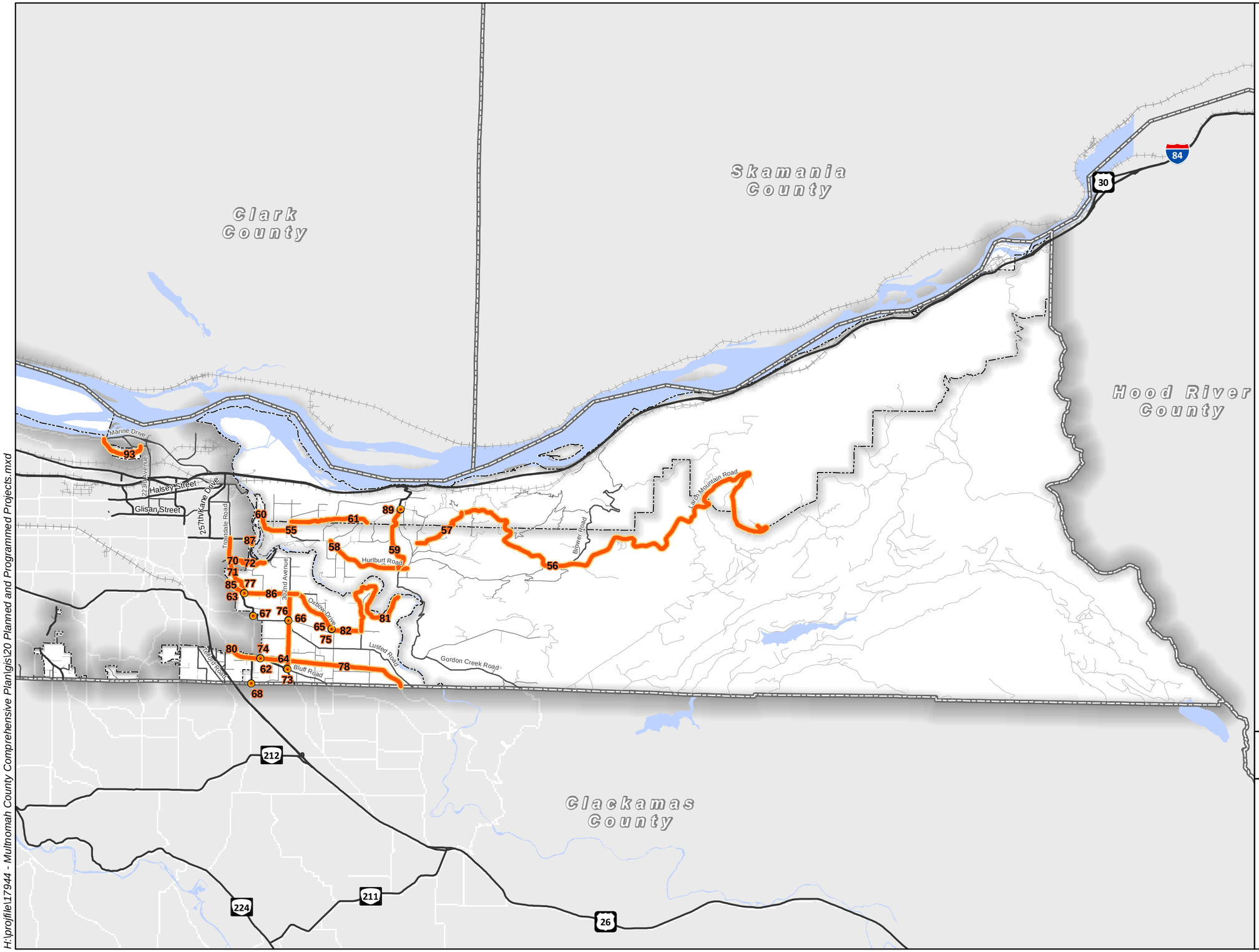
H:\projfile\17944 - Multnomah County Comprehensive Plan\gis\20 Planned and Programmed Projects.mxd



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Multnomah County
Comprehensive Plan

Figure 20B

Planned and Programmed Projects

- Project Points
- Project Segments
- Plan Areas
- County Boundaries

0 1 2 4 Miles

Prepared By:
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Date:
6/8/2015

Coordinate System:
NAD 1983 HARN State Plane Oregon North FIPS 3601

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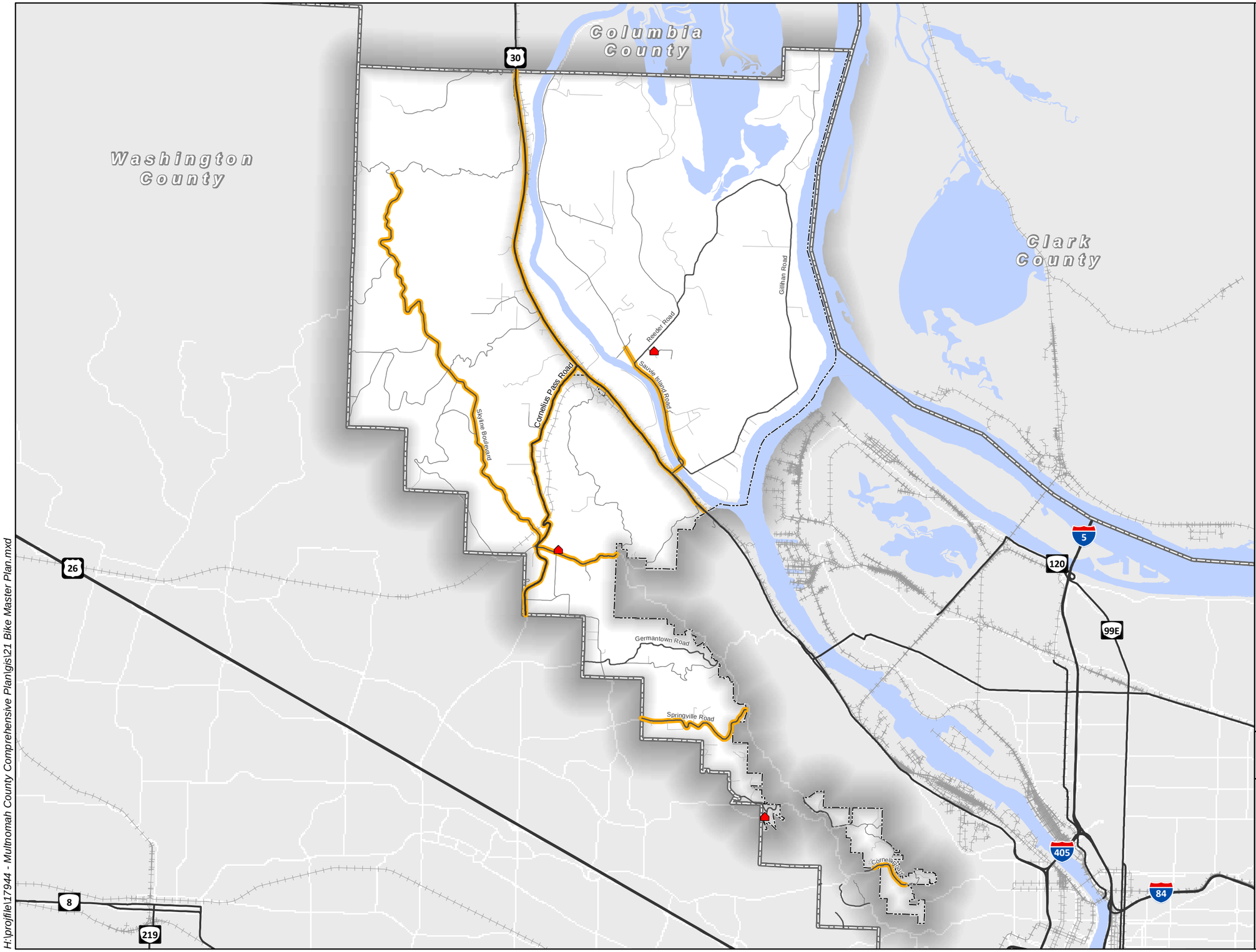

Multnomah County
Comprehensive Plan

Figure 21A

Master Bike Plan

Prepared By:
Kittelson & Associates, Inc.

Date:
6/8/2015

Coordinate System:
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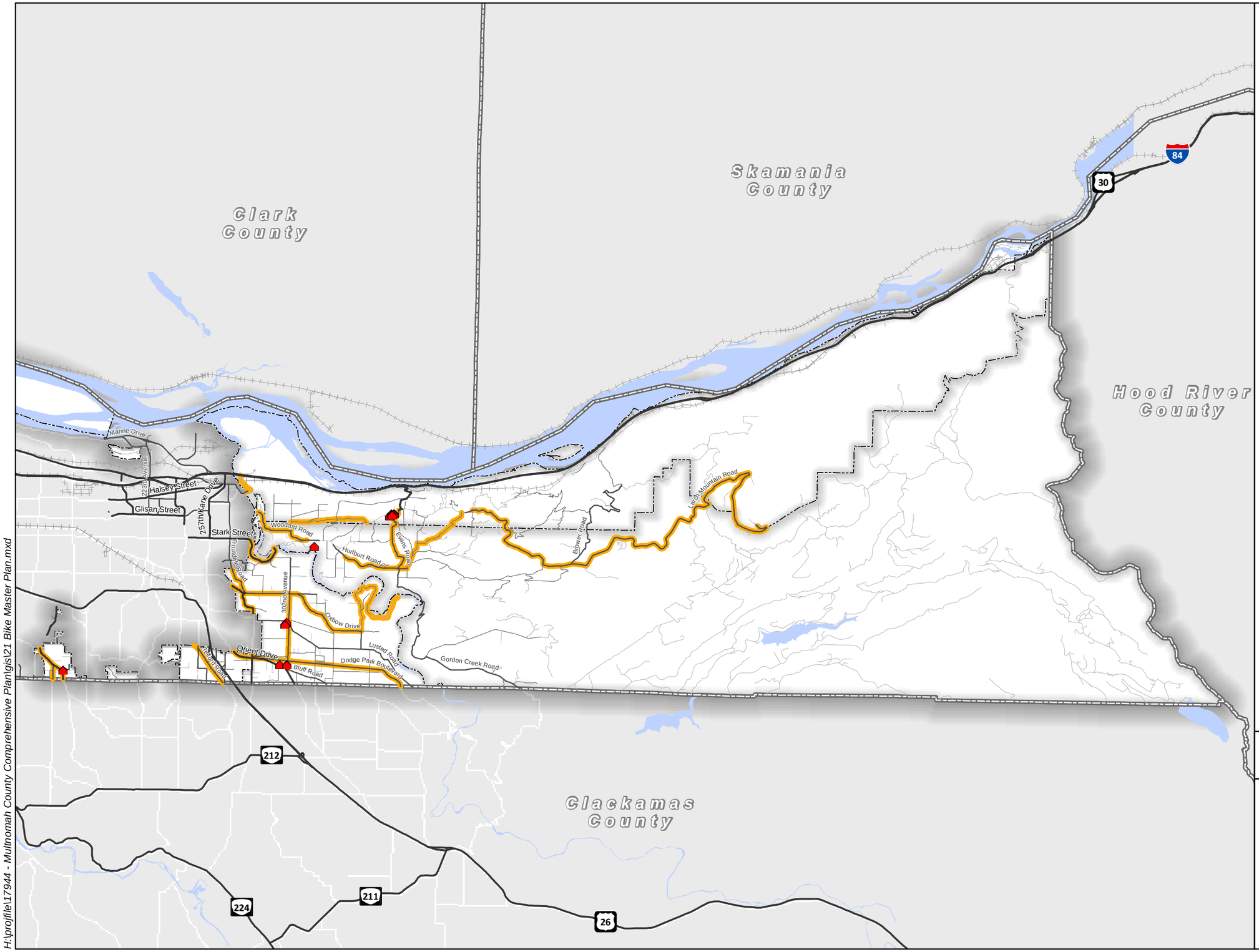
H:\profile\17944 - Multnomah County Comprehensive Plan\gis\21 Bike Master Plan.mxd



Multnomah County
Comprehensive Plan

Figure 21B
Master Bike Plan

Schools
Bikeways Plan
Plan Areas
County Boundaries

0 1 2 4 Miles

Prepared By:
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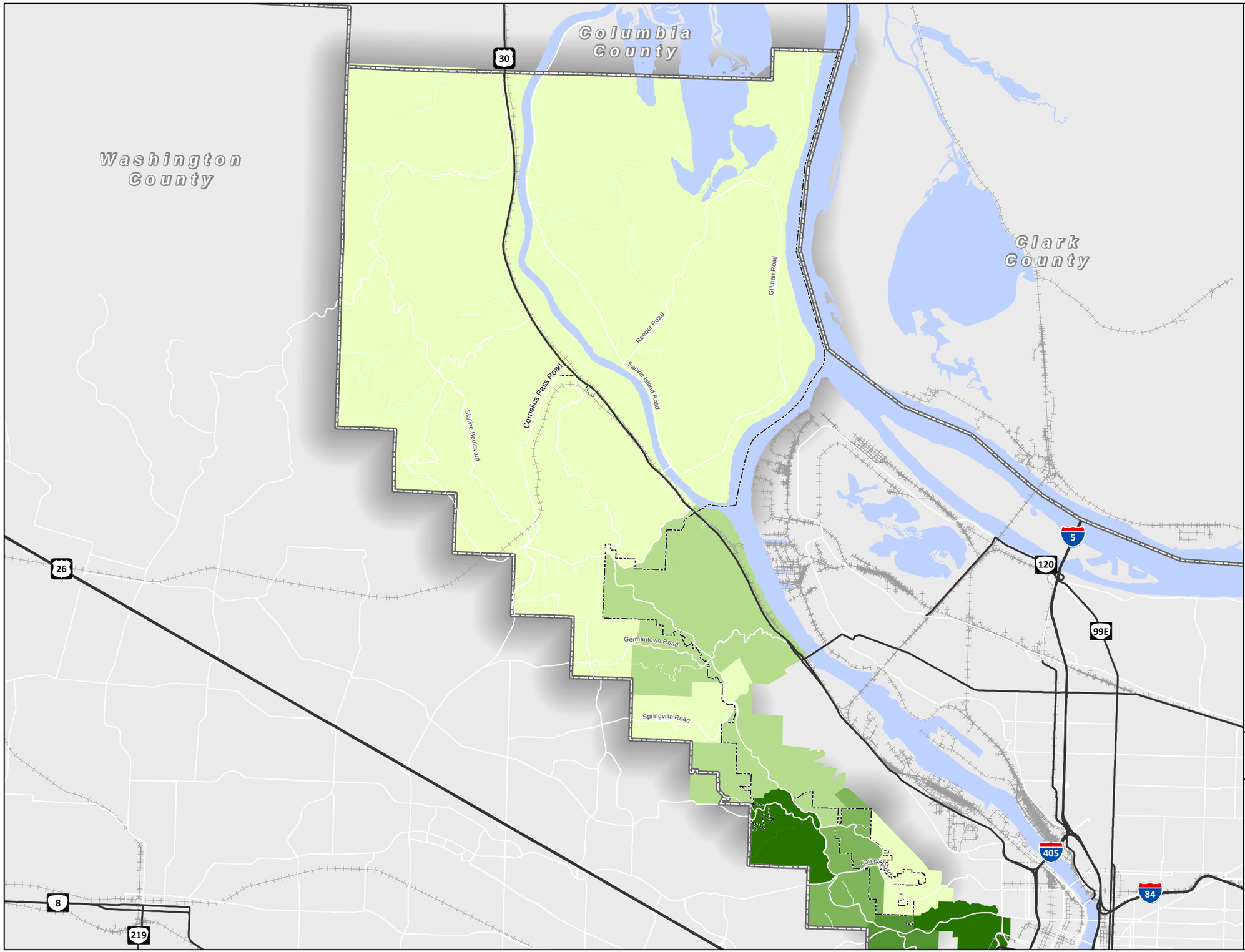
H:\profile\17944 - Multnomah County Comprehensive Plan\gis\21 Bike Master Plan.mxd

Appendix 2 TAZ Map and Data



Multnomah County Comprehensive Plan

Existing Housing Density / Housholds per Acre by TAZ

- 0.00 - 0.07
- 0.08 - 0.16
- 0.17 - 0.60
- 0.61 - 2.03
- 2.04 - 4.52
- Plan Areas
- County Boundaries

0 0.5 1 2 Miles

Prepared By:
Kittelson & Associates, Inc.

Date:
1/22/2015

Coordinate System:
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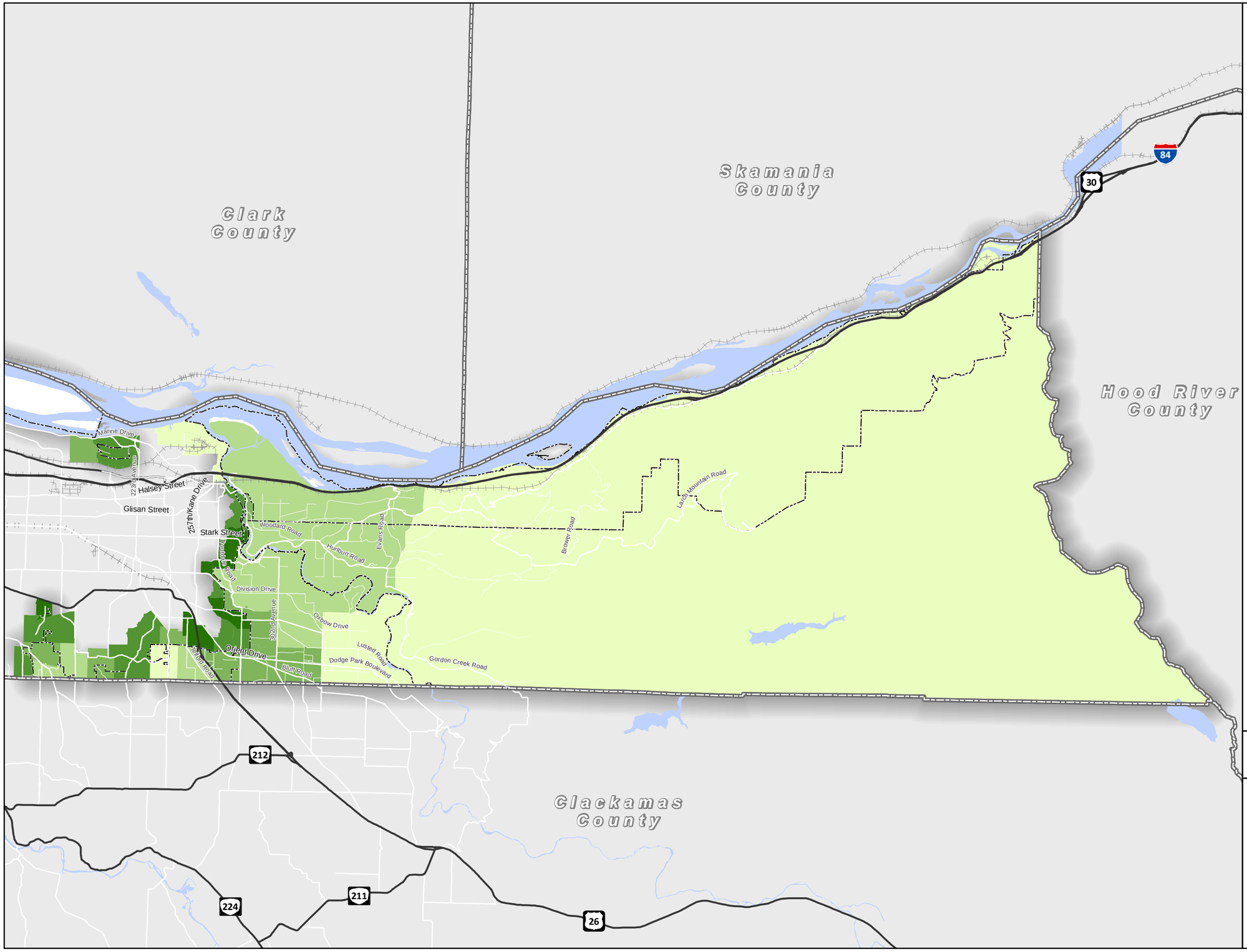

Multnomah County
Comprehensive Plan

Existing Housing Density / Housholds per Acre by TAZ

- 0.00 - 0.07
- 0.08 - 0.16
- 0.17 - 0.60
- 0.61 - 2.03
- 2.04 - 4.52
- Plan Areas
- County Boundaries

0 1 2 4 Miles

Prepared By:
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Date:
1/22/2015

Coordinate System:
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TAZ	COUNTY	CITYNAME	HH_Est	Acres	HH_Est_Per_Acres	Study_Area	HH_2010	HH_2025	HH_2035	HH_2040
41	Multnomah	Unincorporated Multnomah County	230	677.2785034	0.339594424	Inside	230	280	285	289
42	Multnomah	Unincorporated Multnomah County	88	553.7416992	0.158918858	Inside	88	190	173	175
46	Multnomah	Unincorporated Multnomah County	87	565.5050049	0.153844789	Inside	87	294	310	311
47	Multnomah	Unincorporated Multnomah County	69	994.6202393	0.069373213	Inside	69	76	77	77
50	Multnomah	Unincorporated Multnomah County	112	1617.817871	0.069229051	Inside	112	127	127	127
51	Multnomah	Unincorporated Multnomah County	806	18539.10156	0.043475676	Inside	806	1011	982	982
52	Multnomah	Unincorporated Multnomah County	410	16136.27832	0.025408585	Inside	410	444	440	440
418	Multnomah	Unincorporated Multnomah County	404	133.4250183	3.027917862	Inside	404	573	686	813
469	Multnomah	Unincorporated Multnomah County	78	350.3316345	0.222646177	Inside	78	303	346	348
470	Multnomah	Unincorporated Multnomah County	29	186.9356232	0.15513362	Inside	29	95	157	200
474	Multnomah	Unincorporated Multnomah County	25	480.1582336	0.05206617	Inside	25	264	431	481
475	Multnomah	Unincorporated Multnomah County	72	553.6829224	0.130038321	Inside	72	201	393	461
476	Multnomah	Unincorporated Multnomah County	113	451.9336243	0.250036716	Inside	113	119	119	212
651	Multnomah	Unincorporated Multnomah County	815	9016.890625	0.090385929	Inside	815	860	861	862
652	Multnomah	Unincorporated Multnomah County	88	1261.890503	0.069736637	Inside	88	91	91	92
653	Multnomah	Unincorporated Multnomah County	7	93.94351959	0.074512854	Inside	7	17	19	19
654	Multnomah	Unincorporated Multnomah County	17	105.3690109	0.161337763	Inside	17	18	18	18
655	Multnomah	Unincorporated Multnomah County	102	511.5376892	0.199398801	Inside	102	115	115	973
656	Multnomah	Unincorporated Multnomah County	154	623.8569336	0.246851474	Inside	154	164	164	1380
657	Multnomah	Unincorporated Multnomah County	241	781.2597046	0.30847618	Inside	241	244	244	249
658	Multnomah	Unincorporated Multnomah County	94	790.3630371	0.118932687	Inside	94	97	97	98
659	Multnomah	Unincorporated Multnomah County	124	1600.389038	0.077481158	Inside	124	150	145	154
660	Multnomah	Unincorporated Multnomah County	173	2797.650635	0.061837599	Inside	173	187	184	189
661	Multnomah	Unincorporated Multnomah County	573	107817.2188	0.00531455	Inside	573	635	628	629

Cap_2045	Shape_Length_1	Shape_Area_1	HH_2040_Per_Acres	Shape_Length	Shape_Area	Density_Change_2010_to_2040	Change_2010_to_2040
807.5496574	22432.13611	29502251.09	0.426707774	22432.13618	29502251.16	0.087113351	59
110.5336193	23742.24967	24120988.16	0.316031814	23742.2497	24120987.93	0.157112956	87
450.1998185	21678.52347	24633397.65	0.549950898	21678.52366	24633397.68	0.396106124	224
7.683710195	34505.87115	43325657.24	0.07741648	34505.87127	43325657.58	0.008043267	8
14.95114286	44901.1205	70472146.59	0.0785008	44901.12047	70472146.72	0.009271748	15
246.4731367	139550.758	807563234.2	0.052969124	139550.7577	807563233.7	0.009493448	176
37.33714286	121123.7036	702896270.2	0.02726775	121123.7036	702896270.1	0.001859166	30
880.2769016	12212.47969	5811993.681	6.093309879	12212.47961	5811993.725	3.065392017	409
2640.625923	17335.98278	15260446.56	0.993344486	17335.98288	15260446.62	0.770698309	270
522.726764	14258.03617	8142915.997	1.069887042	14258.03614	8142915.969	0.914753437	171
683.7998921	18443.27774	20915692.49	1.001753092	18443.27774	20915692.69	0.949686944	456
567.7335666	21441.52407	24118429.07	0.832606494	21441.52405	24118428.98	0.702568173	389
391.3412871	19991.55884	19686228.06	0.469095439	19991.55866	19686228.11	0.219058722	99
48.38599821	124070.4482	392775774.6	0.095598362	124070.4485	392775774.5	0.005212434	47
3.75	37855.62758	54967948.97	0.072906487	37855.62792	54967949.34	0.00316985	4
13.75	10735.86522	4092179.686	0.202249184	10735.86531	4092179.719	0.12773633	12
1.25	12503.17729	4589874.28	0.170828208	12503.17731	4589874.269	0.009490445	1
3068.393684	22708.55299	22282581.36	1.902108192	22708.55296	22282581.15	1.702709436	871
4365.113408	23509.83166	27175208.35	2.21204567	23509.8316	27175208.05	1.965194225	1226
11.11995929	23909.05521	34031673.28	0.318716049	23909.05541	34031673.17	0.010239869	8
3.733714286	24616.25592	34428213.35	0.12399365	24616.2561	34428213.45	0.005060963	4
29.96742857	52040.796	69712947.35	0.096226603	52040.79599	69712946.81	0.018745445	30
16.20114286	57555.82094	121865664.1	0.067556687	57555.82099	121865664.6	0.005719088	16
67.386	354248.7535	4696531192	0.005833931	353002.7351	4696518028	0.000519381	56

TAZ	COUNTY	CITYNAME	EMP_Total	Acres	Total_2010_ Per_Acres	COUNTY_1	Total_2025	Total_2035	Total_2040
41	Multnomah	Unincorporated Multnomah County	160	677.2784932	0.236239597	Multnomah	236	271	285
42	Multnomah	Unincorporated Multnomah County	8	553.7416879	0.014447169	Multnomah	49	75	87
46	Multnomah	Unincorporated Multnomah County	15	565.5049972	0.026524965	Multnomah	25	29	30
47	Multnomah	Unincorporated Multnomah County	13	994.6202384	0.013070315	Multnomah	16	19	20
50	Multnomah	Unincorporated Multnomah County	130	1617.817877	0.080355152	Multnomah	182	204	214
51	Multnomah	Unincorporated Multnomah County	174	18539.10087	0.009385568	Multnomah	276	322	351
52	Multnomah	Unincorporated Multnomah County	401	16136.27801	0.024850836	Multnomah	455	487	516
418	Multnomah	Unincorporated Multnomah County	233	133.4250166	1.746299148	Multnomah	583	752	833
469	Multnomah	Unincorporated Multnomah County		350.3316488		Multnomah	457	682	764
470	Multnomah	Unincorporated Multnomah County		186.9356283		Multnomah	121	155	176
474	Multnomah	Unincorporated Multnomah County	29	480.1582343	0.060396757	Multnomah	232	320	359
475	Multnomah	Unincorporated Multnomah County	28	553.6829426	0.050570458	Multnomah	558	774	884
476	Multnomah	Unincorporated Multnomah County	42	451.9336112	0.092934005	Multnomah	707	982	1136
651	Multnomah	Unincorporated Multnomah County	361	9016.891058	0.040035971	Multnomah	410	433	447
652	Multnomah	Unincorporated Multnomah County	145	1261.890481	0.114906959	Multnomah	172	180	185
653	Multnomah	Unincorporated Multnomah County		93.94351973		Multnomah	0	0	0
654	Multnomah	Unincorporated Multnomah County		105.3690144		Multnomah	6	7	7
655	Multnomah	Unincorporated Multnomah County		511.5376756		Multnomah	176	187	315
656	Multnomah	Unincorporated Multnomah County	241	623.856934	0.386306524	Multnomah	346	391	567
657	Multnomah	Unincorporated Multnomah County	45	781.2597146	0.057599284	Multnomah	66	73	77
658	Multnomah	Unincorporated Multnomah County	37	790.3630268	0.046813931	Multnomah	51	52	53
659	Multnomah	Unincorporated Multnomah County	95	1600.389045	0.059360567	Multnomah	117	124	128
660	Multnomah	Unincorporated Multnomah County	261	2797.650702	0.093292564	Multnomah	325	338	346
661	Multnomah	Unincorporated Multnomah County	281	107817.2183	0.002606263	Multnomah	300	313	320

Shape_Length_1	Shape_Area_1	Total_2040_ Per_Acres	Study_Area	Shape_Length	Shape_Area	Density_Change_ From_2010_to_2040	Change_From_ 2010_to_2040
22432.13611	29502251.09	0.420801789	Inside	22432.13618	29502251.16	0.184562191	125
23742.24967	24120988.16	0.157112971	Inside	23742.2497	24120987.93	0.142665803	79
21678.52347	24633397.65	0.053049929	Inside	21678.52366	24633397.68	0.026524965	15
34505.87115	43325657.24	0.020108176	Inside	34505.87127	43325657.58	0.007037861	7
44901.1205	70472146.59	0.132276937	Inside	44901.12047	70472146.72	0.051921785	84
139550.758	807563234.2	0.018932957	Inside	139550.7577	807563233.7	0.009547389	177
121123.7036	702896270.2	0.031977635	Inside	121123.7036	702896270.1	0.007126799	115
12212.47969	5811993.681	6.243206978	Inside	12212.47961	5811993.725	4.496907711	600
17335.98278	15260446.56	2.180790901	Inside	17335.98288	15260446.62		
14258.03617	8142915.997	0.941500604	Inside	14258.03614	8142915.969		
18443.27774	20915692.49	0.747670174	Inside	18443.27774	20915692.69	0.687273443	330
21441.52407	24118429.07	1.596581697	Inside	21441.52405	24118428.98	1.546011209	856
19991.55884	19686228.06	2.513643503	Inside	19991.55866	19686228.11	2.42070961	1094
124070.4482	392775774.6	0.04957363	Inside	124070.4485	392775774.5	0.00953766	86
37855.62758	54967948.97	0.146605432	Inside	37855.62792	54967949.34	0.031698473	40
10735.86522	4092179.686	0	Inside	10735.86531	4092179.719		
12503.17729	4589874.28	0.066433191	Inside	12503.17731	4589874.269		
22708.55299	22282581.36	0.615790427	Inside	22708.55296	22282581.15		
23509.83166	27175208.35	0.908862233	Inside	23509.8316	27175208.05	0.522555709	326
23909.05521	34031673.28	0.098558776	Inside	23909.05541	34031673.17	0.040959492	32
24616.25592	34428213.35	0.067057788	Inside	24616.2561	34428213.45	0.020243857	16
52040.796	69712947.35	0.079980552	Inside	52040.79599	69712946.81	0.020619985	33
57555.82094	121865664.1	0.123675197	Inside	57555.82099	121865664.6	0.030382633	85
354248.7535	4696531192	0.002967978	Inside	353002.7351	4696518028	0.000361715	39

Appendix 3 Historical AADT

Table 15 Historical AADT on State Highways in Rural Multnomah County

Primary Road	HWY	MP	Description	AADT by Year										
				2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Columbia River Highway (US 30)	002	18.12	0.30 mile east of Jordan Interchange	25,100	24,800	26,100	26,600	26,700	26,300	28,000	28,100	25,300	25,700	26,200
	002	22.40	0.30 mile east of Corbett Interchange	22,400	22,100	24,300	24,700	24,900	24,600	26,300	26,400	23,500	23,700	24,200
	002	25.19	0.20 mile east of Rooster Rock State Park Interchange	22,200	21,900	24,400	24,800	25,000	24,500	26,100	26,300	23,300	23,500	23,900
	002	28.16	0.30 mile east of Bridal Veil connection	21,400*	21,100*	23,500*	23,900*	24,000	23,500	25,100	25,300	21,700	21,800	22,200
	002	31.89	0.50 mile east of Multnomah Falls Interchange	21,200	20,900	23,200	23,600	23,800	23,100	24,800	24,900	21,100	21,100	21,500
	002	35.73	0.10 mile east of Historic Columbia Highway (US30)	21,000*	20,700*	23,300*	23,700*	23,800	23,300	25,000	24,900	21,100	21,100	21,500
Mt. Hood Highway (US 26)	026	14.80	0.05 mile south of S.E. Palmquist Road	26,700*	25,700*	26,200*	27,200*	27,000*	25,800	26,600	26,600	25,200	27,300	27,600
	026	18.30	0.05 mile northwest of S.E. Haley Road	22,800*	21,900*	22,300*	24,600*	24,400*	23,300	22,900	22,900	21,700	24,100	24,400
Lower Columbia River (US 30)	092	10.75	0.08 mile south of Sauvie Island Road	-**	-**	-**	23,400	21,400	20,600	20,900	17,000	16,700	16,500	16,800
	092	10.95	0.12 mile north of Sauvie Island Road	-**	-**	-**	21,600	22,100	20,400	20,700	17,100	16,800	16,600	16,900
	092	13.12	0.10 mile south of Cornelius Pass Road	-**	-**	-**	20,800	22,000	20,300	20,500	17,400	17,100	16,900	17,200

	092	17.34	0.05 mile south of Rocky Point Road	-**	-**	-**	25,100	27,800	25,600	26,000	23,100	22,700	22,500	22,800

*Count location shifted 0.1 mile or less from where counts are recorded currently; no major intersections were included or excluded with the shift

**No counts were recorded on the segment for the year reported