CLACKAMAS COUNTY
TRANSIT DEVELOPMENT PLAN

TRANSIT DEVELOPMENT PLAN

April 2021

CLACKAMAS COUNTY

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ACKNOWLEDGEMENTS

The development of this plan was guided by the Project Management Team (PMT), Technical Advisory Committee (TAC), Project Advisory Committee (PAC), Clackamas County Planning Commission, Clackamas County Board of Commissioners, and members of the public. Each individual devoted their time and effort to provide valuable input and feedback and their participation was instrumental in the development of the plan.

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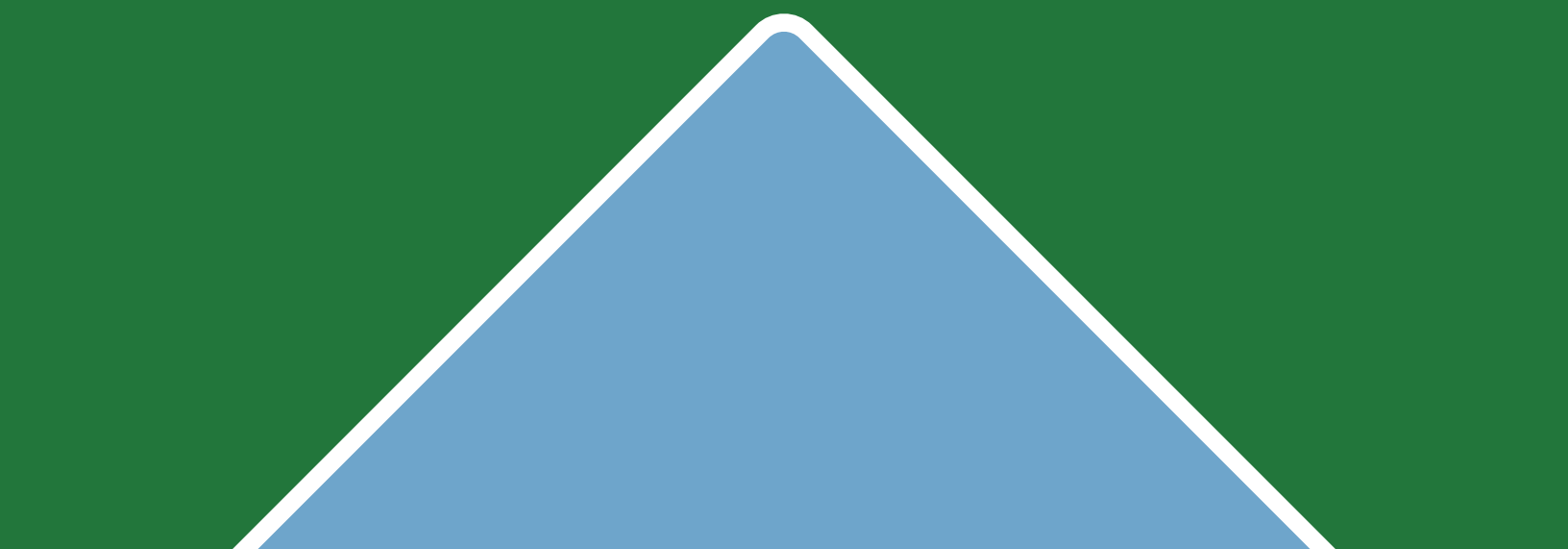
INTRODUCTION

- PUBLIC INVOLVEMENT PROCESS



Introduction

In 2017, the Oregon legislature passed Keep Oregon Moving (HB 2017), which created a new source of funds for transit projects. These funds are available for transit projects both inside and outside of existing transit districts and service areas. Projects must be identified within a plan in order to be eligible for funding through HB 2017.

Clackamas County has a unique and growing role as a coordinator of transit services between the six public transit districts in addition to Clackamas County's role as a facilitator to implement small scale transit and transportation services. Prior to the passage of HB 2017, Clackamas County managed the distribution of funds for transportation services for elderly and disabled populations, as well as for the Mt Hood Express transit service through its Social Services division. With the advent of this new source of funds available for transit service both within and outside of existing districts and service areas, and the ability to access funds for transit shuttles within the TriMet district, the County's responsibilities have expanded.

The Clackamas County Transit Development Plan (TDP) has been created to provide guidance on transit connections between existing providers outside the TriMet service area, as well as input into transit service within the TriMet service area. The TDP includes transit project priorities to connect communities within Clackamas County, both urban and rural, and provides guidance on infrastructure investments needed to support transit use throughout the county. The intent of the TDP is to guide future transit investments and communicate a connected and coordinated vision for transit service and access to transit within Clackamas County. In particular, this TDP:

- Guides investments of Statewide Transportation Improvement Fund (STIF) grants by identifying needed and priority connections in portions of the county currently lacking transit service, and
- Identifies other actions needed to support transit usage throughout the County.

The TDP is focused in two areas:

- *Within the Clackamas County portion of the TriMet service area*, the TDP provides detailed analysis and transit level-of-service information to inform future STIF plans and TriMet service implementation. (Transit planning for areas of the county with other existing service providers [e.g., Wilsonville, Canby, Molalla, Sandy] is addressed in those providers' TDPs, which are reviewed in the *Reference D: Background Information and Existing Conditions Memorandum*.)
- *In unincorporated areas located between existing service providers and with no current transit service provider*, the TDP recommends how transit service providers can cover these areas in the future and how existing transit services across the county can be better connected.

Figure 1 shows the project process undertaken to develop this TDP.

In addition to the TDP, Clackamas County and other transit providers in the region are working on additional ongoing transit projects:

- Vision Around the Mountain: ODOT's Vision Around the Mountain is a strategic planning project to improve public access to Mt. Hood region by establishing a shared, long-term, regional transit vision. The project will guide transit network coordination and connection across multiple jurisdictions under a unified vision.
- Shuttle Program: The Clackamas County Shuttles provide enhanced options and access in areas currently unserved or underserved by transit. The shuttles include first/last-mile services in Oregon City, Clackamas Industrial Area, and Milwaukie Industrial Area, as well as a service connecting Tualatin, West Linn, and Oregon City. The first shuttles will begin operation in 2021.

- Enhanced Transit Corridors, Express and Limited-Stop Market Analysis: Regional transit planning efforts have included Metro's identification of Enhanced Transit Corridors (ETCs) and TriMet's Express and Limited-Stop Market Analysis, with desired outcomes of faster transit trips in the region through corridor improvements or express services. Future studies are likely to identify other candidate corridors, and Clackamas County should track these for consistency with this TDP.

Public Involvement Process

The public involvement program for the Clackamas County TDP shared information and gathered input from the community related to transit needs and desires. The public involvement goals were to:

- Communicate complete, accurate, understandable and timely information to the public throughout the project.
- Help the public understand the need to create improved transit connections.
- Actively seek public input from a broad, diverse audience at project milestones to understand the transit needs and desires of the community.
- Provide meaningful public involvement opportunities and demonstrate how input has influenced the process.
- Seek participation of potentially affected and/or interested individuals, neighborhoods, businesses and organizations, including from under-represented communities such as low-income residents, non-English speakers and others from diverse backgrounds.
- Comply with Civil Rights Act of 1964 Title VI requirements to ensure that this plan does not subject any person to discrimination on the basis of race, color or national origin.
- Ensure that the public involvement process is consistent with applicable state and federal laws and requirements, and is responsive to local policies, goals and objectives.

The TDP creation process included numerous touchpoints where stakeholders and the public could provide input. This included four meetings each with a Technical Advisory Committee (TAC) and Project Advisory Committee (PAC). The TAC, made up of County staff that interfaces with transit, as well as city and public transit agency staff from across Clackamas County, provided technical input at various stages in the planning process. The PAC, made of up community members representing various interests within the county, provided higher-level guidance throughout the planning process.

As the COVID-19 pandemic spread to Oregon and Governor Brown issued the Stay Home, Save Lives executive order on March 23rd, 2020, it became clear that the public involvement activities for this plan would need to shift to a virtual environment to reduce spread of the virus. All TAC and PAC meetings were held over Zoom, both project surveys were administered entirely online, and community planning organization meetings and targeted outreach to community groups were all done virtually.

Table 1 summarizes the activities, details, and purpose of each activity. Further details on the public involvement strategy are included in *Reference A: Public Involvement Plan*, and further details on the public involvement findings are included in *Reference B: Outreach Summary*.

Figure 1. Project Process

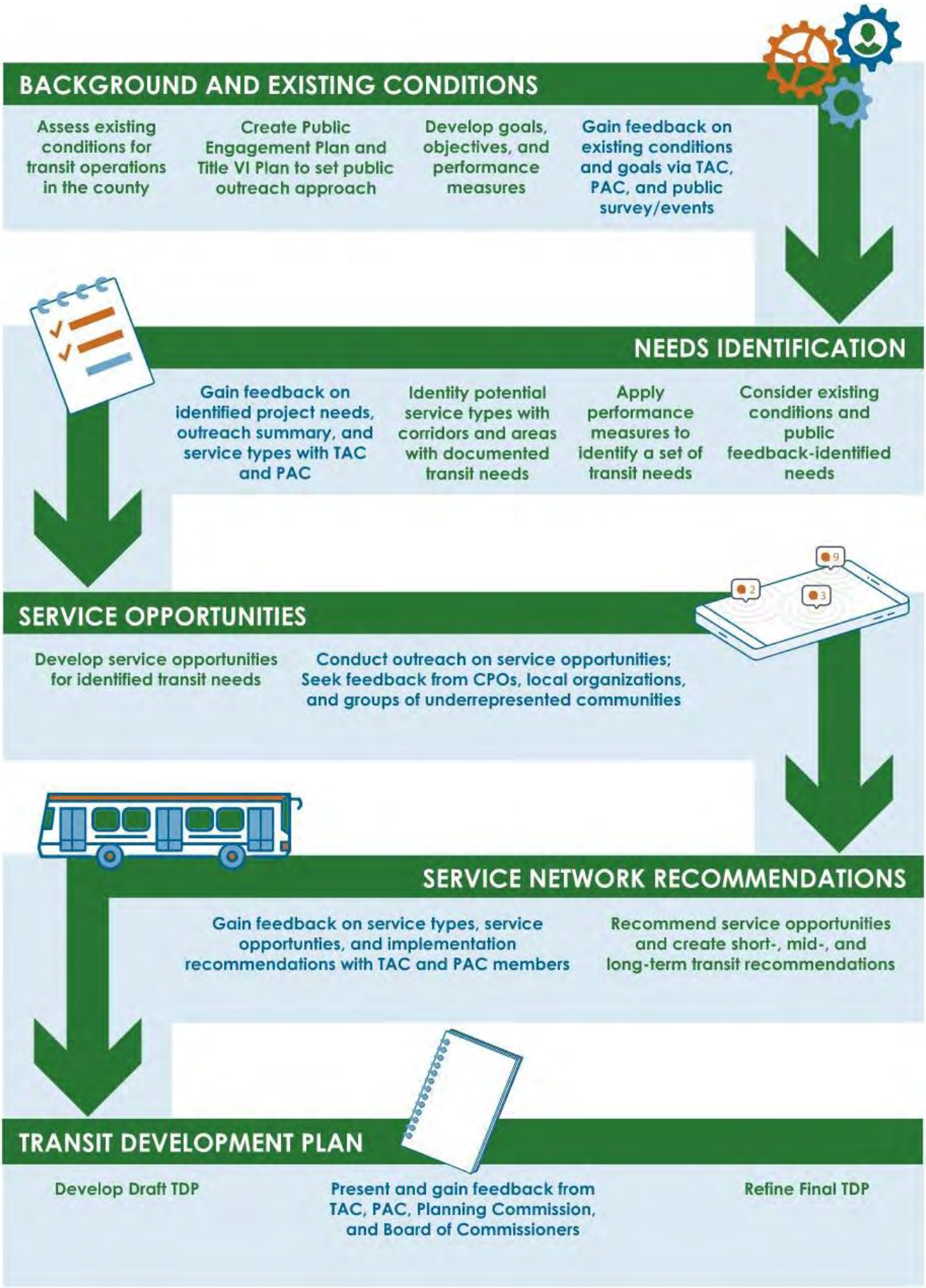
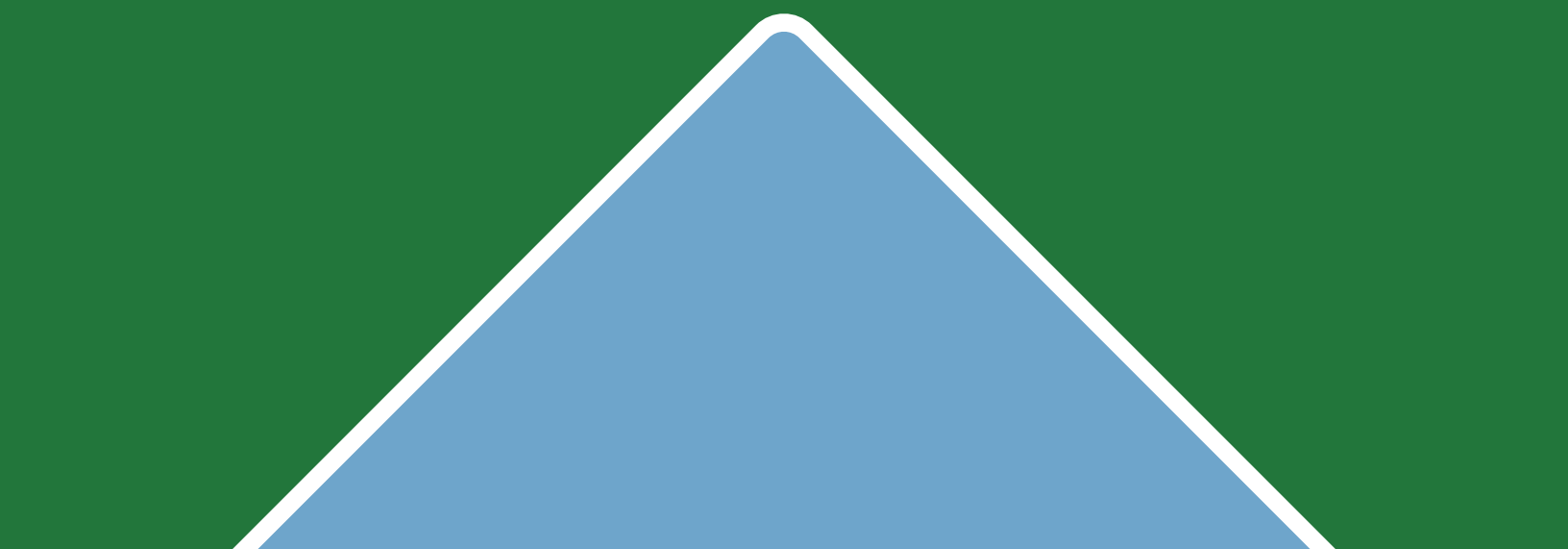


Table 1. Public Involvement Activities for the Clackamas County TDP

TYPE OF ACTIVITY	ACTIVITY DETAILS AND PURPOSE
Project Website Throughout Project	Provide updates on project activities and documents, including links to online surveys and a continuously available commenting map.
TAC Meeting #1 May 5th, 2020 – Zoom **PAC Meeting #1** May 12th, 2020 - Zoom	Review background information and existing conditions for the project as well as discuss project goals, objectives, and performance measures.
Online Survey #1 June 3rd, 2020 – July 2nd, 2020	Understand how respondents use transit currently (in a non-COVID world), where they would like to go using transit, and how they'd like to use transit in the future.
Small Group Listening Sessions June 17th, 2020, June 25th, 2020, and July 7th, 2020	Discuss existing transit use and potential high-level changes or additions to the countywide transit network.
TAC Meeting #2 July 15th, 2020 – Zoom **PAC Meeting #2** July 28th, 2020 - Zoom	Review needs assessment for transit across the county and outline the process for creating transit service alternatives.
Community Planning Organizations Outreach Jennings Lodge CPO – September 22nd Oak Grove Community Council – September 23rd Hamlet of Beavercreek – September 23rd Firwood Neighbors – October 6th Redland – Fischers Mill – Viola CPO – January 6th	Share future service alternatives and solicit feedback on routing for new transit service.
Online Survey #2 September 23rd – October 25th, 2020	Seek feedback on future service alternatives and whether respondents would use the proposed transit routes.
TAC Meeting #3 October 20th, 2020 – Zoom **PAC Meeting #3** November 4th, 2020 – Zoom	Review future service alternatives and share a proposed short-term, medium-term, and long-term implementation plan for new transit service.
Targeted Presentations to Community Groups West Linn Community Council North Clackamas Parks and Recreation District leadership team Bridgeport Elementary Bilingual School Parent-Teacher Organization HINT (Hispanic Interagency Networking Team)	Share future service alternatives and solicit feedback on routing for new transit service.
Social Media Posts Mid-December 2020	Targeted Facebook posts to solicit feedback from the Redland community in conjunction with the Redland – Fischers Mill – Viola CPO meeting.
TAC Meeting #4 January 25, 2021 – Zoom **PAC Meeting #4** January 26, 2021 – Zoom	Review a draft version of the TDP and solicit final feedback on the plan.
Clackamas County Coordinating Committee TBD – Zoom	Present the draft TDP and solicit feedback from elected leaders across the county.
Clackamas County Board of Commissioners TBD - Zoom	Seek adoption of the Clackamas County TDP.

VISION, GOALS, AND OBJECTIVES

- PROJECT VISION
- GOALS AND OBJECTIVES



Vision, Goals, and Objectives

This section highlights the project vision, goals, and objectives that informed the TDP process and will continue to provide guidance as Clackamas County implements this plan.

Project Vision

A vision for the TDP is as follows:

> *Provide guidance for an equitable, safe, convenient and connected transit network throughout Clackamas County that will support the health and well-being of Individuals, communities, the economy and the environment.*

The foundation for the vision for the TDP is rooted in key themes and goals from local, regional and state transit plans. Almost all providers note equity, health and safety, customer service (reliability, information availability) and connectivity (links to other providers, and coordination) as goals.

Goals and Objectives

The TDP policy language draws from visions, goals, objectives and criteria developed through past transportation planning efforts in the county. In particular, the Clackamas County Transportation System Plan (TSP), Oregon Public Transportation Plan and related Statewide Transportation Improvement Fund (STIF) criteria help shape the goals, objectives and evaluation criteria, given their focus on customer experience and increased coordination and collaboration. Many of the objectives within equity, health, and safety overlapped and were consolidated into one goal area. Environmental and economic objectives also overlapped and were consolidated into one sustainability goal.

Many objectives have different applications in an urban environment compared to a small city or rural environment. For example, Objective 2E refers to providing access to transit stops. In an urban environment, this objective would align more to TSP Policy 5.T.10 "Urban: Require pedestrian and transit supportive features and amenities and direct access to transit for new development". In a rural environment, this objective would align more to TSP Policy 5.T.14 "Rural: Focus safety improvements near existing or planned transit stops."

Goal 1: Enhance Connectivity

- Objective 1A – Identify where connections can be made between communities within the County and between significant County destinations including housing, shopping, recreation and employment areas.
- Objective 1B – Collaborate with all transportation service providers, pairing traditional fixed-route and demand-response services with first-/last-mile connection options such as shuttles, transportation network companies (TNCs), sharing of bikes and other mobility devices, and cooperative programs such as those within assisted living communities.
- Objective 1C – Facilitate improved coordination between transit providers through technologies, fare policies, timed transfers, and other approaches to provide seamless transportation within and beyond Clackamas County.
- Objective 1D – Coordinate with other public agencies and divisions, such as those responsible for land use planning, housing, and development review, to strengthen transit effectiveness and include transit considerations in growth and development.

Goal 2: Prioritize Equity, Health & Safety

- Objective 2A – Gather feedback from and form partnerships with communities that face higher barriers in using transit to ensure people of all ages, incomes, backgrounds and abilities are meaningfully involved in planning and development at all levels.
- Objective 2B – Focus on access to education and employment opportunities through transit service, capital projects, and programs, especially for low-income residents, historically marginalized communities, and youth.
- Objective 2C – Focus on access to health-supporting destinations, including medical/health care, social services, groceries, recreation and community spaces, parks and natural areas, and social opportunities, particularly for historically marginalized communities, youth, older adults, and people with disabilities.
- Objective 2D – Provide walking and biking access to transit stops that are ADA-accessible, safe, comfortable, and convenient.
- Objective 2E – Identify opportunities for transportation affordability initiatives and invest in transportation investments that demonstrate equitable outcomes.

Goal 3: Promote Sustainability

- Objective 3A – Make county-level investments that help reduce single-occupancy vehicle use and greenhouse gas emissions by helping make transit a competitive alternative, such as park-and-rides near regional corridors or support for intercommunity services.
- Objective 3B – Foster environmental sustainability by supporting fuel and propulsion alternatives for transit fleets.
- Objective 3C – Support strategies to implement transit-oriented development, mixed-use development, and other transit-supportive development in the growing areas of Clackamas County, with specific strategies that reflect the differences between urban and rural areas.

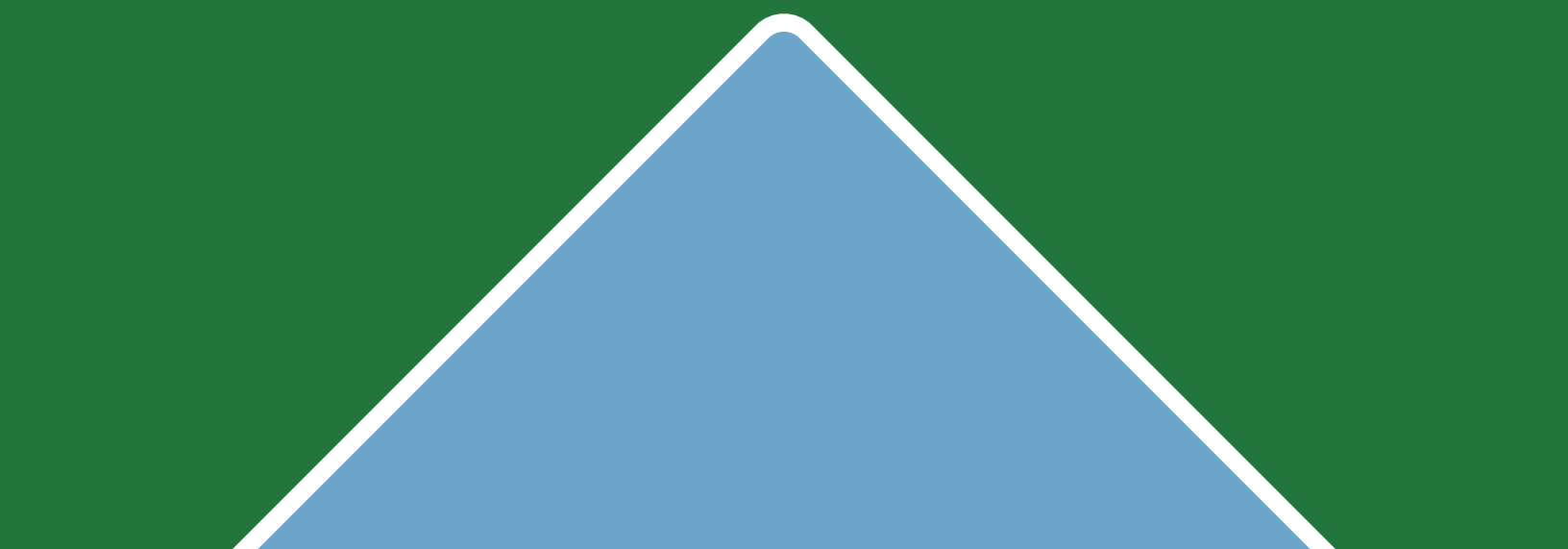
Goal 4: Improve Customer Experience and Mobility

- Objective 4A – Support improvements to service frequency (especially where needed within dense urban areas and between communities) and service reliability.
- Objective 4B – Help transit agencies maintain safe and comfortable transit facilities to enhance customer experience, especially at transit centers and major transit stops.
- Objective 4C – Collaborate with transit agencies to share public transit information in a variety of formats and media to inform and attract new transit users, such as improving availability of route and schedule information as well as access to real-time arrivals and other data.
- Objective 4D – Promote transit-supportive measures including trip planning services, wayfinding signage, stop amenities (e.g., bike racks), and more.

Further details on the project vision, goals and objectives, and evaluation criteria are contained in *Reference C: Goals, Objectives, and Performance Measures Memorandum*.

BASELINE CONDITIONS

- TRANSIT SERVICE OVERVIEW
- LEVEL OF SERVICE ANALYSIS
- POPULATION, EMPLOYMENT, AND LAND USE
- LAND USE



Baseline Conditions

The baseline conditions review the existing transit system across county providers, an overview of ridership and fare systems, weekday and weekend service, a level of service analysis, population and employment information, and future employment and land use trends. Further details on these sections are included in *Reference D: Background Information and Existing Conditions Memorandum.*

Transit Service Overview

There are seven different transit service providers in Clackamas County

Seven primary transit providers provide service within Clackamas County across fixed-route bus, community shuttle, light rail, and commuter rail routes.

Canby Area Transit (CAT)

The Canby Area Transit District, established in December 2001, shares its boundary with Canby's urban growth boundary (UGB). The district includes all areas within the Canby city limits as well as adjacent land within the Canby UGB. CAT's transit network connects Canby to Woodburn and Oregon City.

CCC Xpress Shuttle

Clackamas Community College (CCC) provides free shuttle service between its Oregon City and Harmony campuses and the Clackamas Town Center MAX Station. Service is only available during school terms, but is open to the public and free. The CCC Xpress Shuttle does not have a service district.

Clackamas County – Mt. Hood Express

Clackamas County operates two routes that constitute the Mt. Hood Express: the Express Route with service between Sandy, Government Camp and Timberline Lodge, and the Village Shuttle Route with service between Sandy and Rhododendron.

Sandy Area Metro (SAM)

SAM runs two intercity bus routes connecting Sandy to Gresham and Estacada, along with a shopping shuttle within Sandy. SAM's STAR dial-a-ride, which provides the majority of the agency's ADA paratransit service, is a reservation-only service.

South Clackamas Transportation District (SCTD)

The SCTD service district includes the entire City of Molalla, along with unincorporated areas and rural communities between Molalla, Canby and Oregon City such as Liberal, Mulino, Carus, Lone Elder, Macksburg, Needy, Hamricks Corner and Rural Dell. SCTD provides two intercity bus routes from Molalla to Canby and the Clackamas Community College – Oregon City campus as well as a city loop service in Molalla.

South Metro Area Regional Transit (SMART)

SMART is the City of Wilsonville's transit service. SMART's district boundary is set at Wilsonville's city limits. SMART operates three intercity bus routes (with connections to TriMet in Tualatin, Cherriots in Salem, and CAT in Canby), four Wilsonville local bus routes and two shuttle routes to specific city neighborhoods. Dial-a-ride service includes ADA paratransit, general public dial-a-ride, service for people 60 years of age and older, and out-of-town medical trips. All dial-a-ride trips except for medial trips are limited to SMART's service district.

TriMet

The portion of TriMet's service district in Clackamas County includes the cities of Oregon City, Milwaukie, Lake Oswego, West Linn, Gladstone and Estacada. The majority of Happy Valley is in the service district, but areas east of SE 145th Avenue and SE King Road (including the unincorporated communities of Damascus and Boring) are largely outside the TriMet boundary, TriMet's district boundary outside Oregon City ends at S Henrici Road, runs west to the Willamette River, and then runs along the north side of the Willamette River to Wilsonville.

TriMet provides many fixed-route bus services in Clackamas County, operates the MAX Orange and Green Lines, and provides LIFT paratransit service for people with disabilities or disabling health conditions that prevent them from independently taking bus or rail service. LIFT's service area is three-quarters of a mile beyond the outermost portions of the fixed-route bus and rail network.

Adjacent Fixed-Route Transit Services

There are four connecting fixed-route services that provide service to Clackamas County transit riders, including two – Cherriots in Salem and Woodburn Transit System in Woodburn – that have direct connections with Clackamas County transit providers.

- **Cherriots**: Bus service within Salem-Keizer and to adjacent communities including Wilsonville, Woodburn, Silverton, Dallas, Monmouth and Gates. Buses operate Monday through Saturday; there is no Sunday service.
- **Woodburn Transit Service**: Two local routes in Woodburn: an express loop operating Monday through Friday, and a more comprehensive route that operates seven days a week.
- **Central Oregon Breeze**: Service between Bend and the Portland metropolitan area, with stops at Government Camp, Welches and Sandy in Clackamas County. Eastbound and westbound service operates seven days a week. Reservations can be made in advance, and flag stops along the route can be coordinated with a reservation.
- **Amtrak Cascades**: Trains between cities in Oregon, Washington and British Columbia. Major cities along the route include Vancouver, B.C., Seattle, Portland and Eugene. Four daily trains serve the Oregon City Amtrak station: one with service between Portland and Eugene, and three with service between Seattle and Eugene.

Ongoing Planning Efforts

Clackamas County is currently participating in the Vision Around the Mountain project, an ODOT-led planning project to improve public access to the Mt. Hood region. This project a long-term, regional transit vision for the Mt. Hood area and work to improve transit service to the mountain from Clackamas County and Hood River County.

Clackamas County is also leading an effort to plan for and implement four shuttle routes within and between communities. Three shuttles are targeted to a specific community or employment hub – Oregon City, Clackamas Industrial Area, and Milwaukie Industrial Area – and a fourth shuttle will connect Oregon City, West Linn, and Tualatin along the I-205 corridor where no transit service exists currently. The Oregon City and Clackamas Industrial Area shuttles are scheduled to begin service in 2021.

Figure 2 and Figure 3 show the transit network in Clackamas County by transit provider at the county level and the Portland metro level.

CLACKAMAS COUNTY
TRANSIT DEVELOPMENT PLAN

- TriMet Transit Centers
- Park and ride lots
- TriMet Bus Routes
- South Clackamas Transit District (SCTD) Routes
- Canby Area Transit (CAT) Routes
- Sandy Area Transit (SAM) Routes
- South Metro Area Regional Transit (SMART) Routes
- Mt Hood Express Routes
- CCC Xpress Shuttle Routes
- Existing TriMet Rail
- Regional Center
- Town Center
- Canby Area Transit
- Sandy Area Transit
- South Clackamas Transportation District (SCTD)
- South Metro Area Regional Transit (SMART)
- Tri-County Metropolitan Transportation District of Oregon (TriMet)
- Urban Growth Boundaries
- County Boundary

0 5 Miles

Transit Overview
Clackamas County Transit Development Plan

Figure
2

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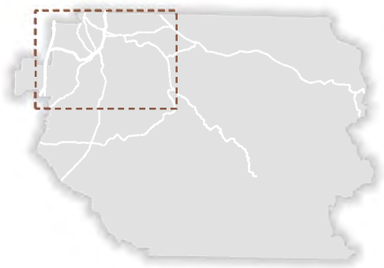
CLACKAMAS COUNTY
TRANSIT DEVELOPMENT PLAN



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0 3 Miles

Transit Overview
Clackamas County Transit Development Plan

Figure
3

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Service miles, service hours, and ridership data for 2013-2017 for all transit service districts in Clackamas County, are shown in comparison results in Table 2 below. Of the 7 transit providers in the county, 5 have transit service districts. Three of these districts – CAT, SAM, and SCTD – are focused on cities outside of the Portland metro area and provide service to the surrounding rural areas. Two of these districts – SMART and TriMet – provide service within the Portland metro area to a larger urban and suburban population. The characteristics of urban, suburban, and rural transit providers vary widely, as Table 2 shows.

Table 2. FY17 Annual Service Miles, Service Hours, and Annual Rides

	CAT	SAM	SCTD	SMART	TriMet
Service Miles	210,918	341,335	252,324	530,233	36,035,999
Service Hours	14,693	15,919	11,598	34,980	3,100,437
Ridership	76,294	121,227	92,077	306,255	98,468,722
Rides per Mile	0.36	0.36	0.36	0.58	2.73
Rides per Hour	5.19	7.62	7.94	8.76	31.76
Fixed-Route Service	✓	✓	✓	✓	✓
Demand-Response	✓	✓		✓	✓

Table 3 shows fare integration and technology use for all transit providers and services in the county.

- Each service has its own unique fare system that is not used by any of the other providers.
- Cash is accepted on all transit services (except for Clackamas Community College's Xpress Shuttle, which is free to use), but a paid fare on one provider does not turn into a paid transfer to another provider.
- CAT, SAM, SCTD, and SMART have received grant funds for a fare study to evaluate reciprocity (i.e., fares that work across multiple systems) and fare technologies.
- TriMet operates the HOP Fastpass system in conjunction with C-TRAN in Clark County, Washington and the Portland Streetcar; which allows users the option to pay fares and transfers via a mobile wallet accessed through a personal smart card or a smartphone, or with a credit or debit card.

Only TriMet and SMART currently have real-time vehicle arrival information available to the public (AVL), and only TriMet currently uses automated passenger counters (APC's), although SCTD and SMART are in the process of implementing one or both technologies. Timed transfers are provided between transit operators at different locations.

Table 3. Technology and Fare Systems in Clackamas County

Transit Agency	Fare System	AVL	APC
CAT	Cash, Paper Ticketing, Monthly Pass	No	No
CCC Xpress Shuttles	Free	Yes (*on TripShot App only*)	No
Mt. Hood Express	Cash	No	No
SAM	Cash, Paper Ticketing, Monthly Pass (*Routes within Sandy are free*)	No	No
SCTD	Cash, Paper Ticketing	In-Process	In-Process
SMART	Cash, Paper Ticketing, Monthly Pass (*Routes within Wilsonville and Tualatin are free*)	Yes (*on SPOT App only*)	In-Process
TriMet	Cash, Hop Fastpass (Mobile Ticketing, Daily/Monthly Passes)	Yes	Yes

Figure 4 and Figure 5 show transit service frequencies on weekdays, Saturdays, and Sundays. As shown:

- Fewer transit routes operate on Sundays relative to other days, and those routes that do operate have fewer runs relative to other days.
- Only TriMet, SAM, and Mt. Hood Express offer Sunday transit service.
- There are no direct connections between Wilsonville and other points in Clackamas County on weekends.
- Canby has no direct service to Wilsonville or to Molalla on the weekend.

Level of Service Analysis

Of the nearly 120,000 Clackamas County residents who live in transit-supportive areas, 53% actually have transit service nearby.

This section examines headway and service span for each transit route in the county, analyzes the transit-supportive areas in the county in the present and the future, and explores where Title VI and underrepresented groups are living in Clackamas County.

Headway, Service Span, and Transit-Supportive Area Level of Service

Common transit terms for evaluating service are defined below:

- Headway is defined as the amount of time between transit vehicles. If a bus arrives at a stop at 8 AM and another bus arrives at the same stop at 8:30 AM, the headway is 30 minutes.
- Service span is defined as the overall amount of time that a transit line is running during the day. If transit service runs from 5 AM to 10 PM, then the service span is 17 hours long.
- Transit-supportive areas are defined as places where household or employment density meet a threshold to support transit service.
- Level of service (LOS) measures the quality of service on an A-F scale, where A is the best and F is the worst[1].

Currently, there are 46 transit routes that operate in Clackamas County across seven different providers. Table 4 shows the Transit LOS analysis for service frequency and hours of service as defined in the Clackamas County Transportation System Plan (TSP). Detailed route information is available in *Reference D: Background Information and Existing Conditions Memorandum*.

Table 4. Service Frequency and Hours of Service LOS for Transit in Clackamas County

Level of Service	Service Frequency (Headway)	Hours of Service (Service Span)
A	0 Routes (0%)	12 Routes (26%)
B	1 Route (2%)	9 Routes (20%)
C	10 Routes (22%)	14 Routes (30%)
D	18 Routes (39%)	4 Routes (9%)
E	11 Routes (24%)	6 Routes (13%)
F	6 Routes (13%)	1 Route (2%)

[1]The transit level of service analysis included in this report is based on the methodology described in *TCRP Report 100: Transit Capacity and Quality of Service Manual* (TCQSM). Detailed information about the TCQSM procedures are included in *Reference D: Background Information and Existing Conditions Memorandum*.

Household and employment data were collected from the 2015 and 2040 Metro Regional Transportation Plan (RTP) model for existing and future conditions. To qualify as a transit-supportive area (TSA), one of the following thresholds must be met to support hourly transit service:

- Minimum population density of 3 households/gross acre; or
- Minimum job density of 4 employees/gross acre.

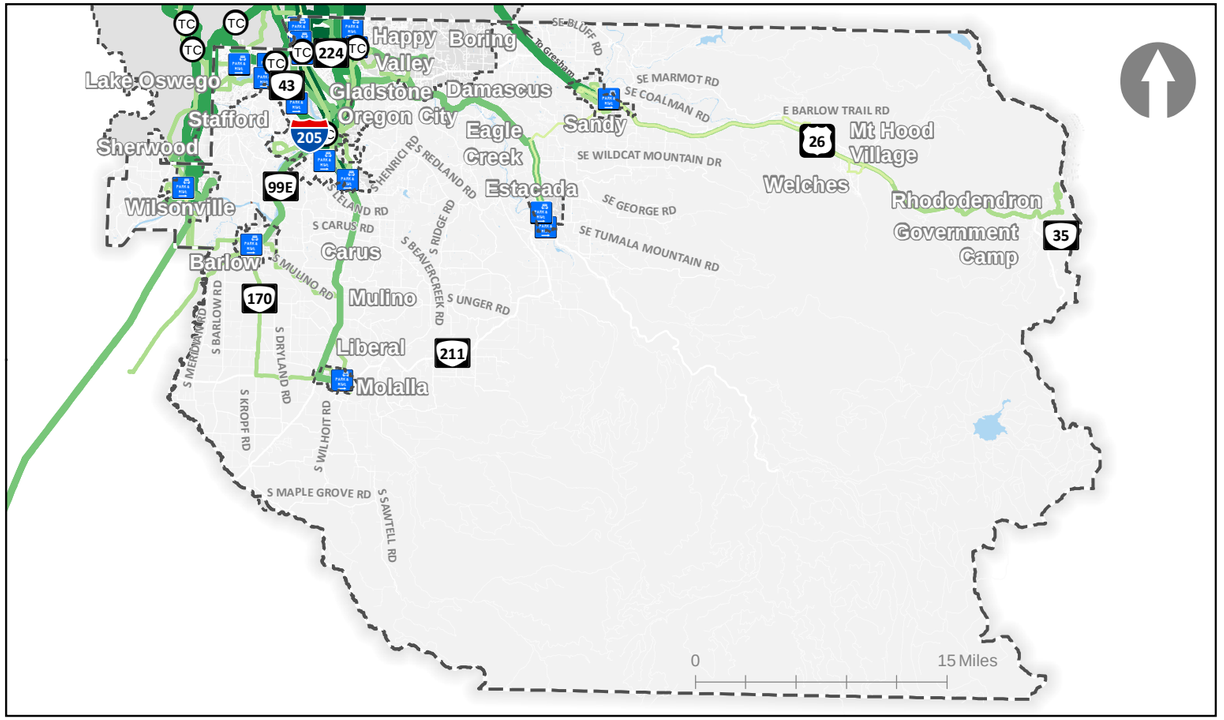
Higher densities and other factors such as land use patterns and connectivity are needed to support more frequent transit service. Table 5 and Table 6 show the TSA analysis for the year 2015 and 2040, respectively. TSA level of service (LOS) thresholds have been derived from the Clackamas County TSP. Figure 6 and Figure 7 show which TSAs are served and not served by transit. The number of TSAs increases between 2015 and 2040. This TSA analysis uses Metro's RTP model for all of Clackamas County. More refined models with transportation analysis zones (TAZ) at a municipal level for cities outside of the Portland metropolitan UGB were not used in this high-level analysis.

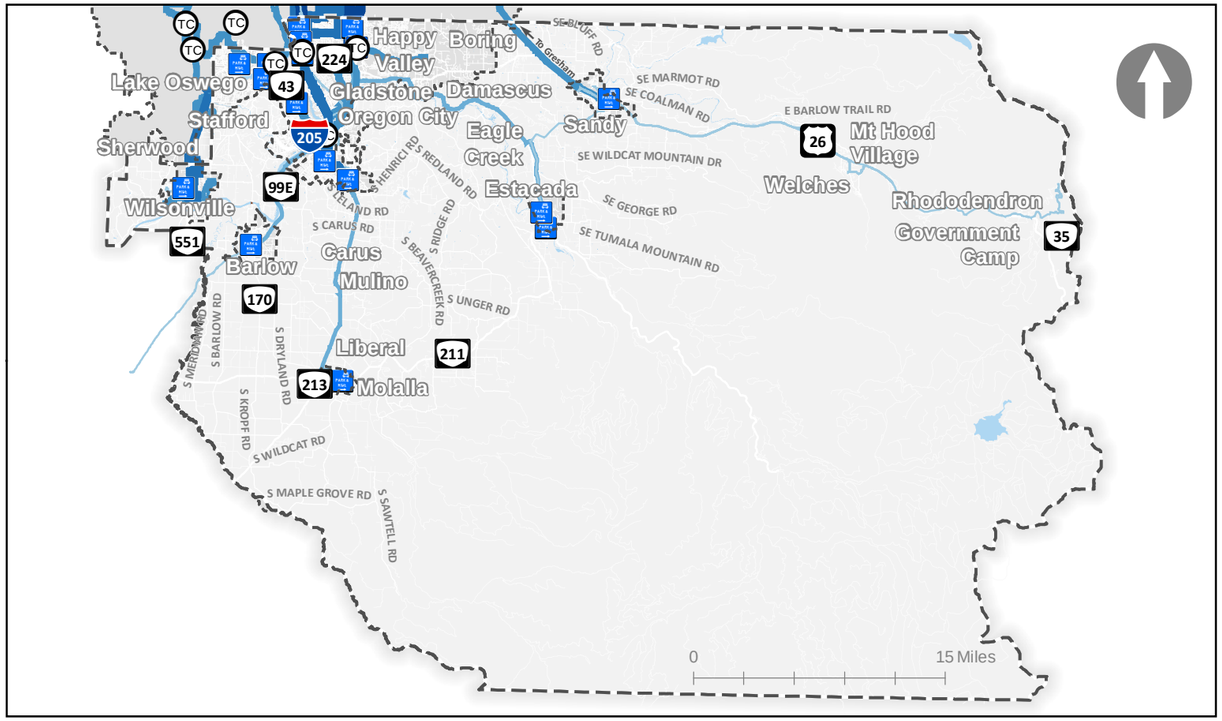
Table 5. 2015 TSA Analysis and LOS for Transit in Clackamas County

Area Type	2015 Population	2015 Employment
Transit-Supportive Area (TSA)	118,908	198,140
Transit-Supportive Area Served	62,632	107,264
Transit-Supportive Areas Without Service	56,276	90,876
Percent of TSA Served by Transit	53%	54%
Level of Service	LOS E	LOS E
Additional Areas Served by Transit	66,573	39,593

Table 6. 2040 TSA Analysis and LOS for Transit in Clackamas County

Area Type	2040 Population	2040 Employment
Transit-Supportive Area (TSA)	194,822	320,484
Transit-Supportive Area Served	99,877	170,267
Transit-Supportive Areas Without Service	94,945	150,217
Percent of TSA Served by Transit	51%	53%
Level of Service	LOS E	LOS E
Additional Areas Served by Transit	64,447	43,327



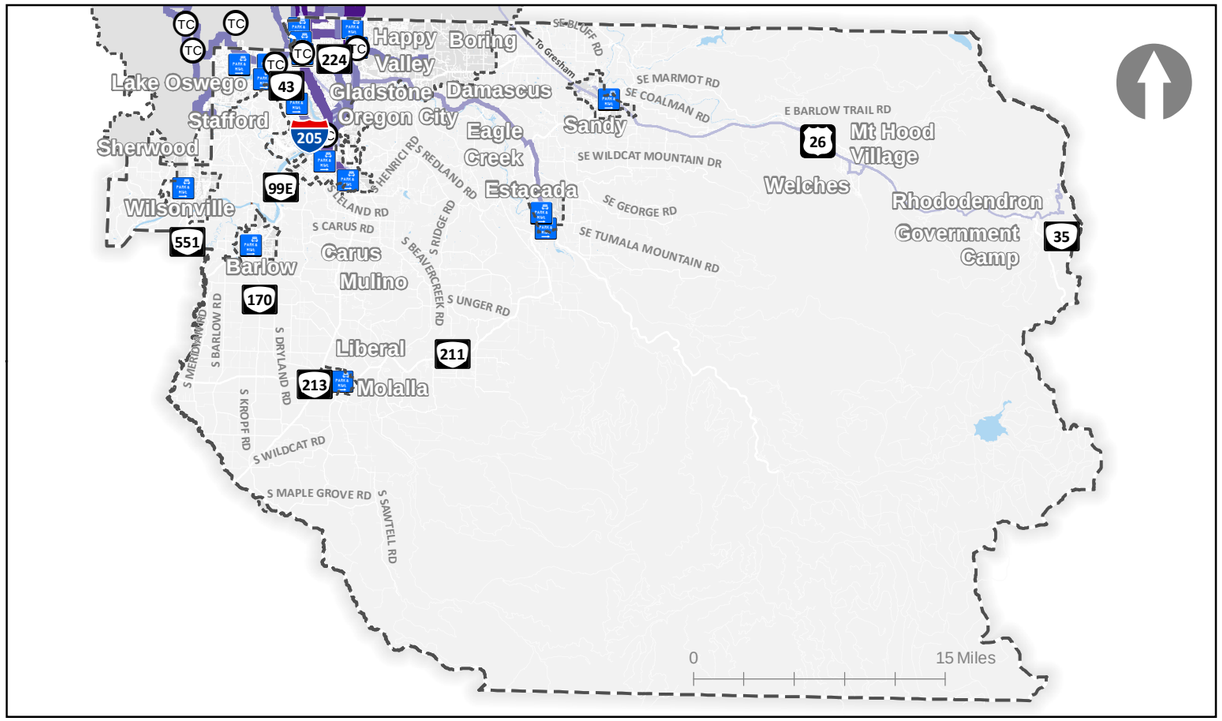


CLACKAMAS COUNTY
TRANSIT DEVELOPMENT PLAN

Legend

- Transit Centers
- Park and ride lots
- Urban Growth Boundaries
- County Boundary

Weekday Transit	Saturday Transit	Sunday Transit
8 or Fewer Runs per Day	8 or Fewer Runs per Day	8 or Fewer Runs per Day
9 - 16 Runs per Day	9 - 16 Runs per Day	9 - 16 Runs per Day
17 - 32 Runs per Day	17 - 32 Runs per Day	17 - 32 Runs per Day
33 - 64 Runs per Day	33 - 64 Runs per Day	33 - 64 Runs per Day
65 or More Runs per Day	65 or More Runs per Day	65 or More Runs per Day



Weekday, Saturday, and Sunday Service Frequency Map
Clackamas County Transit Development Plan

Figure
4

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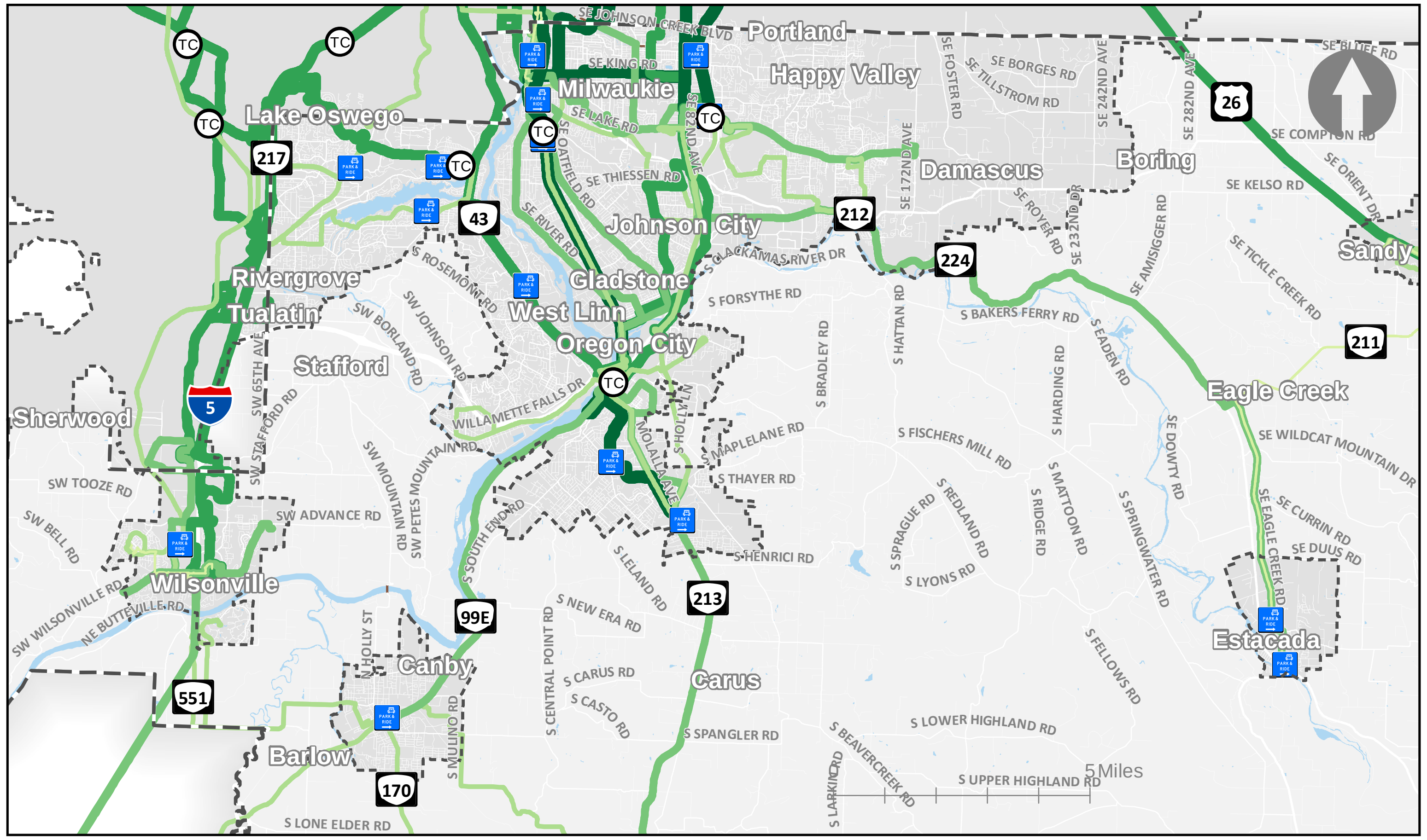
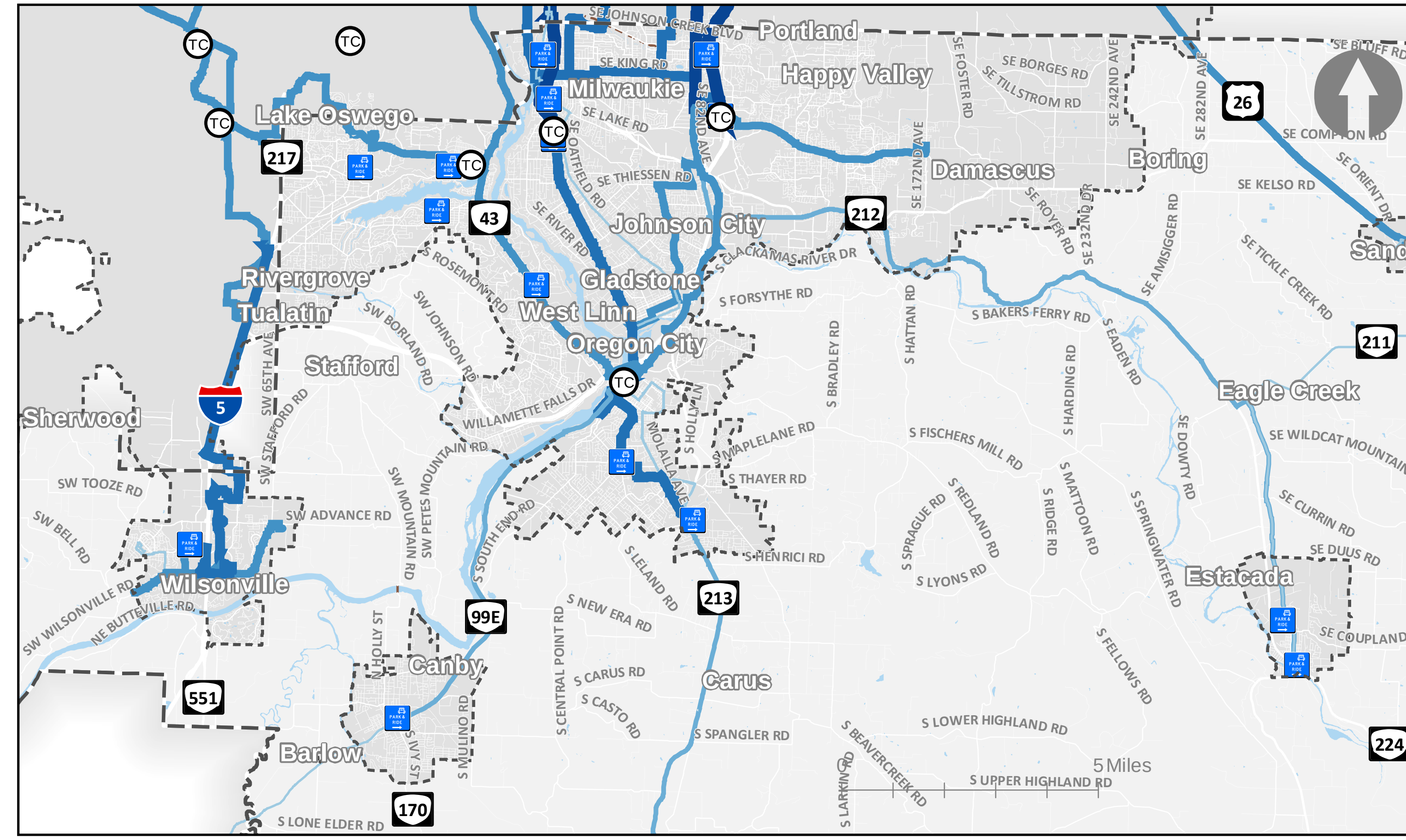
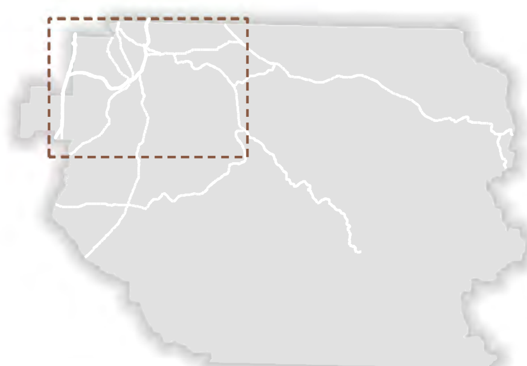
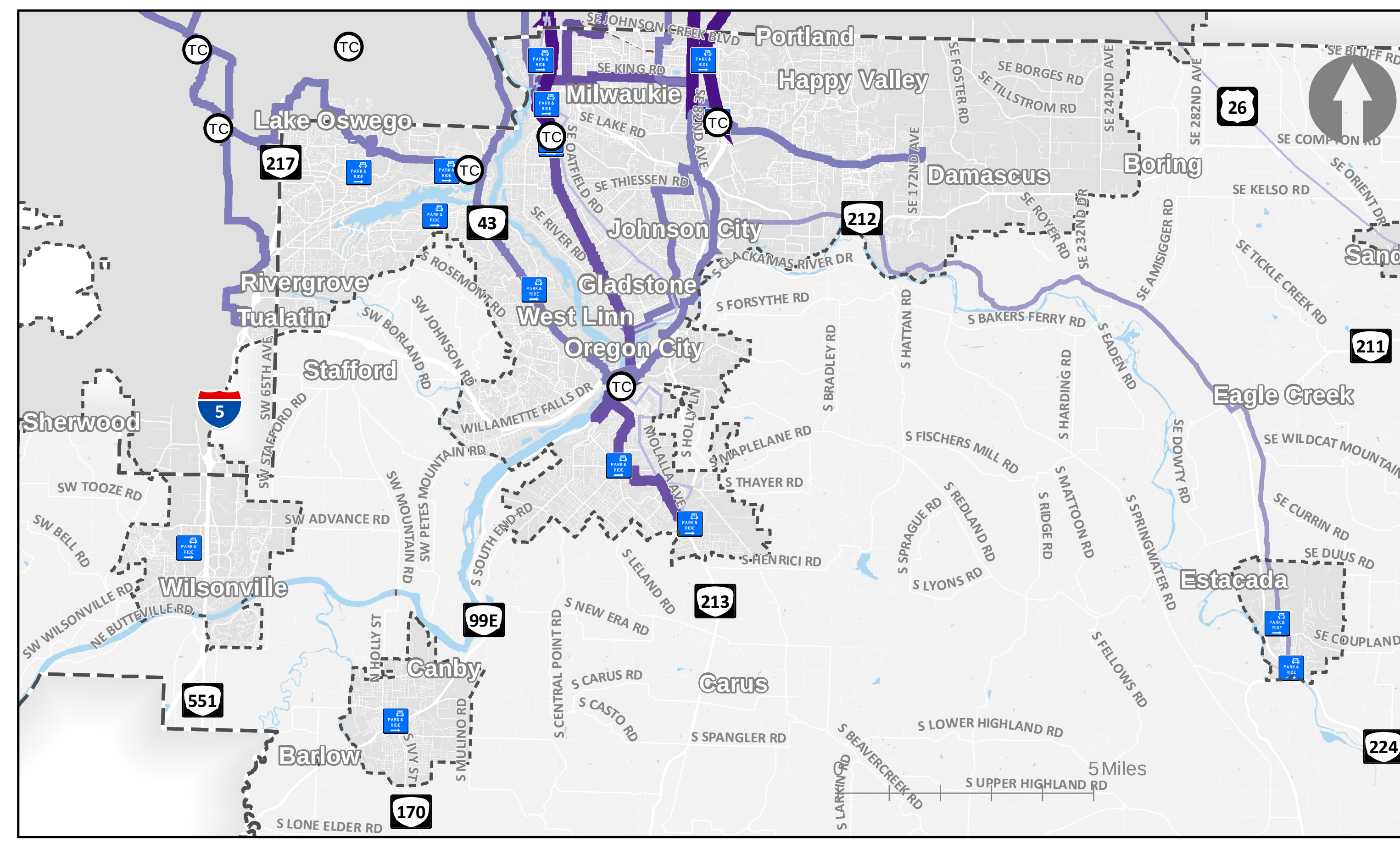




CLACKAMAS COUNTY
TRANSIT DEVELOPMENT PLAN





Legend

- Transit Centers
- Park and ride lots
- Urban Growth Boundaries
- County Boundary

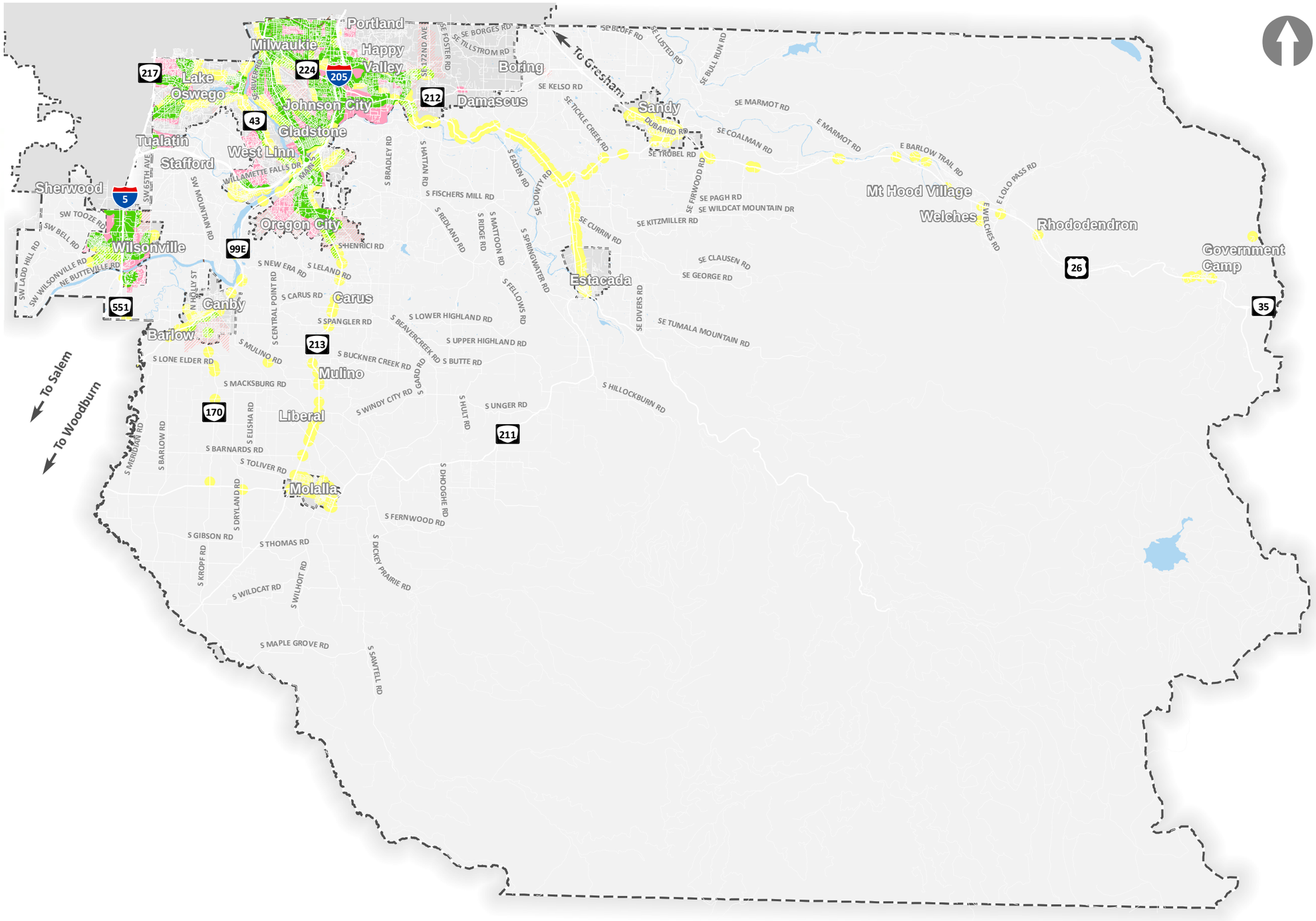
Weekday Transit	Saturday Transit	Sunday Transit
8 or Fewer Runs per Day	8 or Fewer Runs per Day	8 or Fewer Runs per Day
9 - 16 Runs per Day	9 - 16 Runs per Day	9 - 16 Runs per Day
17 - 32 Runs per Day	17 - 32 Runs per Day	17 - 32 Runs per Day
33 - 64 Runs per Day	33 - 64 Runs per Day	33 - 64 Runs per Day
65 or More Runs per Day	65 or More Runs per Day	65 or More Runs per Day

Weekday, Saturday, and Sunday Service Frequency Map
Clackamas County Transit Development Plan

Figure
5

CLACKAMAS COUNTY
TRANSIT DEVELOPMENT PLAN

- Transit Supportive Areas Served in 2015
- Transit Supportive Areas Served in 2040
- Transit Supportive Areas Not Served in 2015
- Transit Supportive Areas Not Served in 2040
- Non-Transit Supportive Areas Served
- Urban Growth Boundaries
- County Boundary



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Transit Supportive Areas
Clackamas County Transit Development Plan

Figure 6

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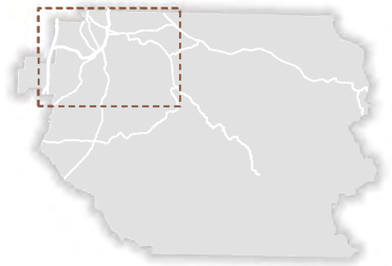
CLACKAMAS COUNTY
TRANSIT DEVELOPMENT PLAN



- Transit Supportive Areas Served in 2015
- Transit Supportive Areas Served in 2040
- Transit Supportive Areas Not Served in 2015
- Transit Supportive Areas Not Served in 2040
- Non-Transit Supportive Areas Served
- Urban Growth Boundaries
- County Boundary

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Transit Supportive Areas
Clackamas County Transit Development Plan

Figure
7

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Title VI and Underrepresented Populations

Title VI of the Civil Rights Act of 1964 prohibits discrimination based on race, color, or national origin for programs or activities that receive federal funds. *Reference E: Title VI Assessment* includes a demographic analysis of the county. Key findings from 2017 data are as follows:

- In 2017 the population of Clackamas County was estimated to be 399,962 people. The TriMet service area within Clackamas County contained 282,575 people.
- Both Clackamas County as a whole and the TriMet service area within Clackamas County contain a slightly higher percentage of White people and a lower percentage of other races and ethnicities than the state of Oregon as a whole.
- Within both the TriMet service area within Clackamas County and the county as a whole, approximately 88% of people speak only English, which is slightly higher than the state of Oregon's 84.8%.
- In 2017 the median household income was $80,033 in the TriMet service area within Clackamas County and $72,408 in Clackamas County as a whole, both of which were higher than the Oregon median income of $56,119. However, 9% of people in Clackamas County and 8.6% of people in the TriMet service area within Clackamas County earned at or below the Federal Poverty Level of $24,600 for a family of four (2017 levels).
- The TriMet service area within Clackamas County and Clackamas County as a whole contain equivalent average percentages of people 65 years and older, at 16.5%. These percentages are similar to, but slightly higher than, the statewide percentage of 16.4%.
- People living with all types of disabilities make up 14.6% of Oregon's population. Disabilities measured in this statistic include vision, hearing, cognitive, ambulatory, self-care, and independent living difficulties. In the TriMet service area within Clackamas County, 32,900 people live with a disability, or 11.7% of the population. In Clackamas County as a whole, 47,004 people live with a disability, or 11.8% of the population.

Population, Employment, and Land Use

The county population is expected to continue growing, with faster growth expected in Sandy, Estacada, Molalla, and Oregon City.

This section examines current population and projected population growth, as well as job locations and projected job sector growth.

Existing Population

Table 7 lists population growth in Clackamas County as a whole and in several communities between 2000 and 2017.

- The County grew 18.2% from 2000 to 2017, while the selected cities saw significantly greater growth.
- Happy Valley's 300% growth over this time period was attributable to new housing construction and newly incorporated land toward Damascus.
- Cities outside the Portland metropolitan UGB were growing fast, with Molalla and Sandy recording nearly 60% and 100% population growth, respectively, between 2000 and 2017. Canby and Estacada each grew by approximately 35% between 2000 and 2017.

Table 7. Study Area Population 2000 – 2017

Place	Population (2000)	Population (2010)	Population (2017)	Pop Growth (2000 - 2017)	% Change (2000 - 2017)	Annual % Change
Clackamas County	338,391	375,992	399,962	61,571	18.2%	1.1%
Oregon City	25,754	31,859	35,483	9,729	37.8%	2.2%
Wilsonville	13,991	19,509	22,789	8,798	62.9%	3.7%
Milwaukie	20,490	20,291	20,627	137	0.7%	0.04%
Happy Valley	4,519	13,903	18,477	13,958	308.9%	18.2%
Canby	12,790	15,829	17,337	4,547	35.6%	2.1%
Sandy	5,385	9,570	10,581	5,196	96.5%	5.7%
Molalla	5,647	8,108	8,987	3,340	59.1%	3.5%
Estacada	2,371	2,695	3,155	784	33.1%	1.9%

Source: U.S. Census 2000 and 2010. ACS 2017 5-Year Estimates.

Future Population Growth

Future population and employment trends were examined to inform future transit needs. Clackamas County's population grew 18% from 2000 to 2017, corresponding to 1.1% average annual growth. Portland State University (PSU) forecasts an annual future growth rate through 2040 of close to 1.5% for Clackamas County (an increase of 141,981 persons). Table 8 shows how growth occurred between 1980 and 2015 for Clackamas County, along with the future growth forecasted to 2040.

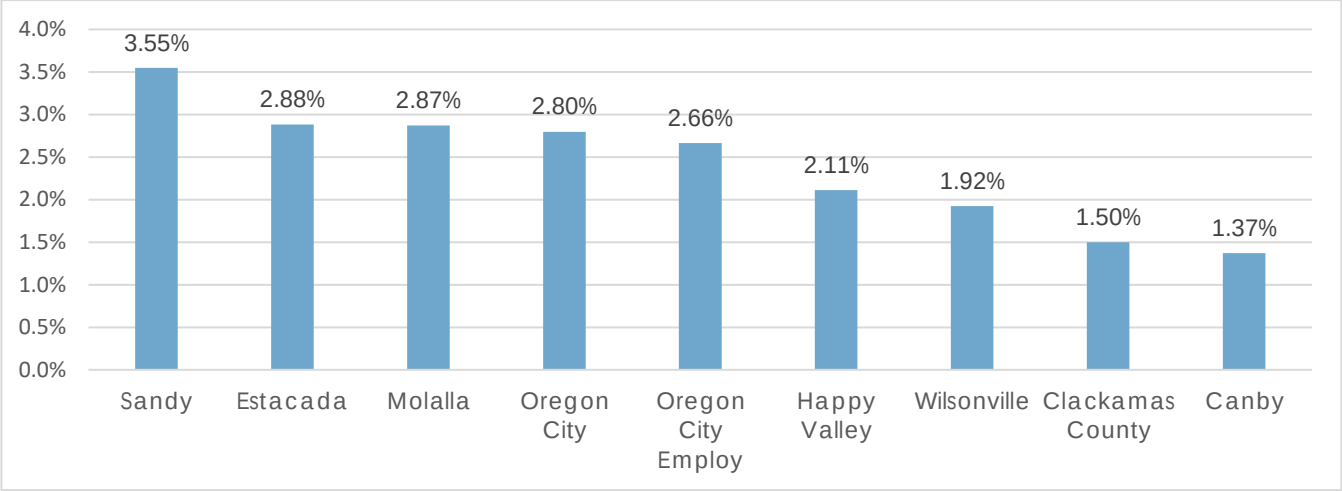
Table 8. Actual and Forecasted Populations of Clackamas County, 1980–2040

		Clackamas County			
	Year	Population	Change	Percent Change	Annual Growth Rate
U.S. Census Bureau Estimate	1980	241,919	-	-	-
	1990	278,850	36,931	15%	2%
	2000	338,391	59,541	21%	2%
	2005	358,301	19,910	6%	1%
	2010	375,992	17,691	5%	1%
	2015	389,438	13,446	4%	1%
PSU Forecast	2020	428,860	39,422	10%	2%
	2025	460,657	31,797	7%	1%
	2030	490,011	29,354	6%	1%
	2035	516,744	26,733	5%	1%
	2040	541,943	25,199	5%	1%

Source: *Current Forecast Summaries*, PSU Population Research Center. Accessed March 13, 2020. https://www.pdx.edu/prc/current-documents-and-presentations.

Figure 8 compares population and household growth projections for Clackamas County and its cities. Growth rates for Clackamas County and cities outside of the Portland metropolitan UGB used 2010 Census populations and projected 2035 populations from PSU's Population Research Center. Oregon City, Wilsonville and Milwaukie growth rates were calculated using household data. As shown, Sandy, Estacada, Molalla and Oregon City are forecast to be some of the fastest-growing cities in the County.

Figure 8. Future Population Growth Within and Nearby Clackamas County



Note: Happy Valley's future population growth estimate was taken from an established study area for 2005 and 2040 as identified in the Happy Valley TSP. Growth rates were calculated using a simple growth rate.

Commute Patterns

The following section describes employment and commuting patterns for Clackamas County. Since this dataset is generated based on administrative records, some work locations may be over- or underrepresented. For example, if workers in Canby have their paychecks processed with an address in Salem, their job site may be shown as Salem instead of Canby, if no local address is given in the administrative data. All data in this section are from 2017, the most recent year with complete data.

Key findings include:

- Portland is the most common destination for employed county residents.
- Portland is the most common home location for employees working in Clackamas County.
- Four of the top 10 work locations for employed county residents are cities in Washington County.
- Just over half of all employed Clackamas County residents and employees in Clackamas County commute 10 miles or less to work.

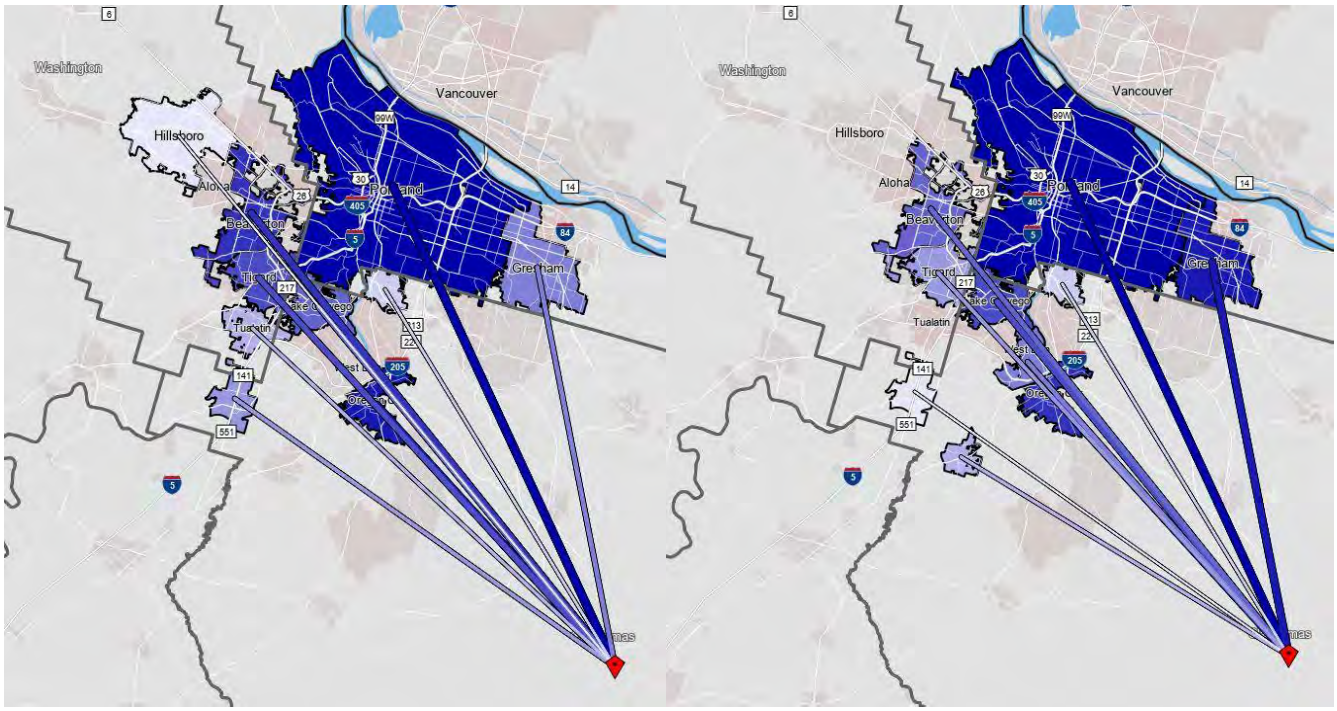
Table 9 and Figure 9 show the primary home locations for employees in Clackamas County and work locations for employed persons living in Clackamas County. *Reference D: Background Information and Existing Conditions Memorandum* provides detailed information about commutes for specific cities within Clackamas County.

Table 9. Employees Coming To and Going From Clackamas County

County Resident Work Locations	Count	Share
Portland	56,985	31.8%
Oregon City	7,378	4.1%
Beaverton	7,305	4.1%
Tigard	7,063	3.9%
Lake Oswego	6,320	3.5%
Gresham	6,001	3.4%
Wilsonville	5,381	3.0%
Tualatin	5,281	3.0%
Milwaukie	5,224	2.9%
Hillsboro	4,253	2.4%
All Other Locations	67,753	37.9%

County Employee Home Locations	Count	Share
Portland	27,295	17.7%
Gresham	6,696	4.3%
Oregon City	6,536	4.2%
Lake Oswego	4,032	2.6%
Beaverton	3,759	2.4%
West Linn	3,616	2.3%
Tigard	3,377	2.2%
Canby	3,347	2.2%
Milwaukie	3,036	2.0%
Wilsonville	3,034	2.0%
All Other Locations	89,455	58.0%

Figure 9. Map of Employees Leaving the County (Left) and Employees Entering the County (Right)



Note: Darker spokes and shading reflect which cities have the most commutes. The darkest city is the top commute location, while the lightest city is the tenth largest commute location.

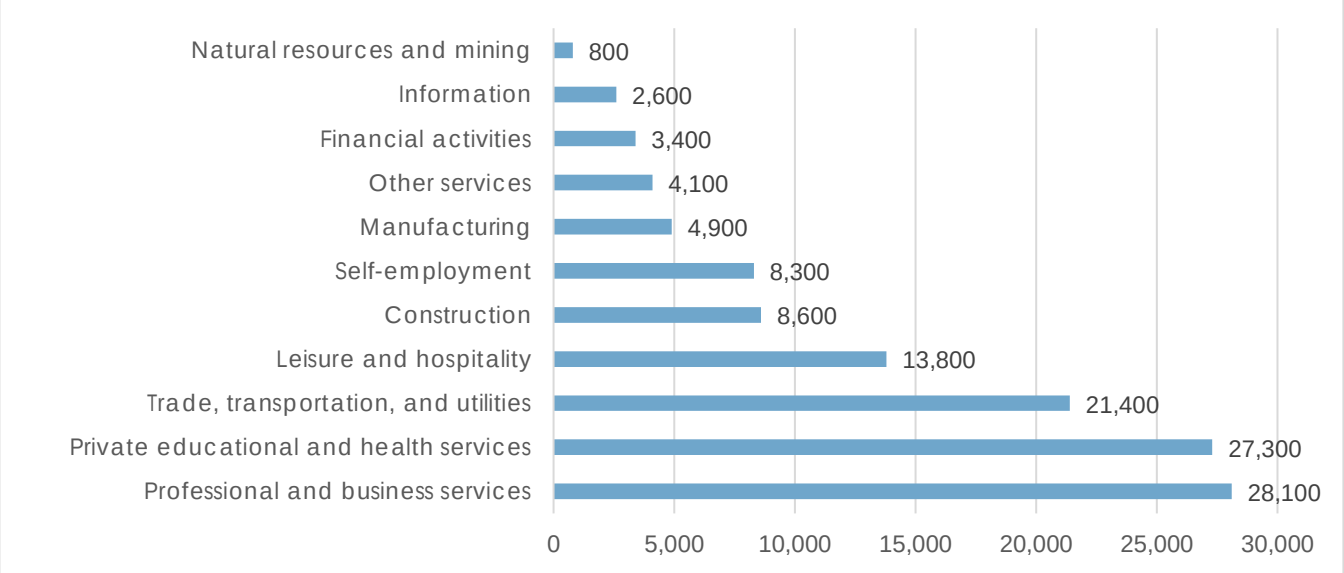
Employment Trends

The Oregon Employment Department, Workforce and Economic Research Division, publishes employment forecasts by industry. These 10-year forecasts are defined by regions and organize employment forecasts by primary industry. Clackamas County's region includes all of Clackamas County, Multnomah County and Washington County. These projections are for 2017-2027 and were developed prior to the COVID-19 pandemic.

It is expected that the largest employment increases will occur in the transportation, warehousing, and utilities (23%), building construction (21%), professional and technical services (21%), and private educational and health services (19%) sectors. An understanding of where faster-growing trade sectors and businesses are located (or could locate) allows for design of transit routes that can efficiently serve

workers and employers. Net changes by industry in Figure 10 show that professional and business services, private educational and health services, and trade, transportation and utilities are projected to add over 20,000 jobs in the next 10 years.

Figure 10. Portland Tri-County Area Employment Changes by Industry 2017–2027



Source: *Employment Projections by Industry and Occupation 2017–2027 Portland Tri-County Area (Clackamas, Multnomah, and Washington Counties)*. https://www.qualityinfo.org/clackamas Accessed February 27, 2020.

Land Use

Metro manages the Portland metropolitan UGB, and Metro partners with Clackamas County to establish urban and rural reserves within the County that could impact the Metro UGB. The cities of Gladstone, Happy Valley, Johnson City, Lake Oswego, Milwaukie, Oregon City, Rivergrove, West Linn and Wilsonville are within Metro's UGB.

Land use development is anticipated near Wilsonville/Stafford, Oregon City, and Damascus/Boring.

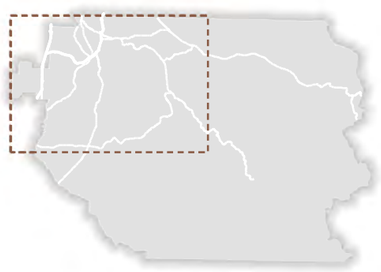
Urban reserves are lands suitable for accommodating urban development within the next 50 years, while rural reserves are lands protected from urbanization for the next 50 years.

Figure 11 shows Clackamas County land inside Metro's UGB (yellow), land designated as urban reserve (blue), and land designated as rural reserve (green).

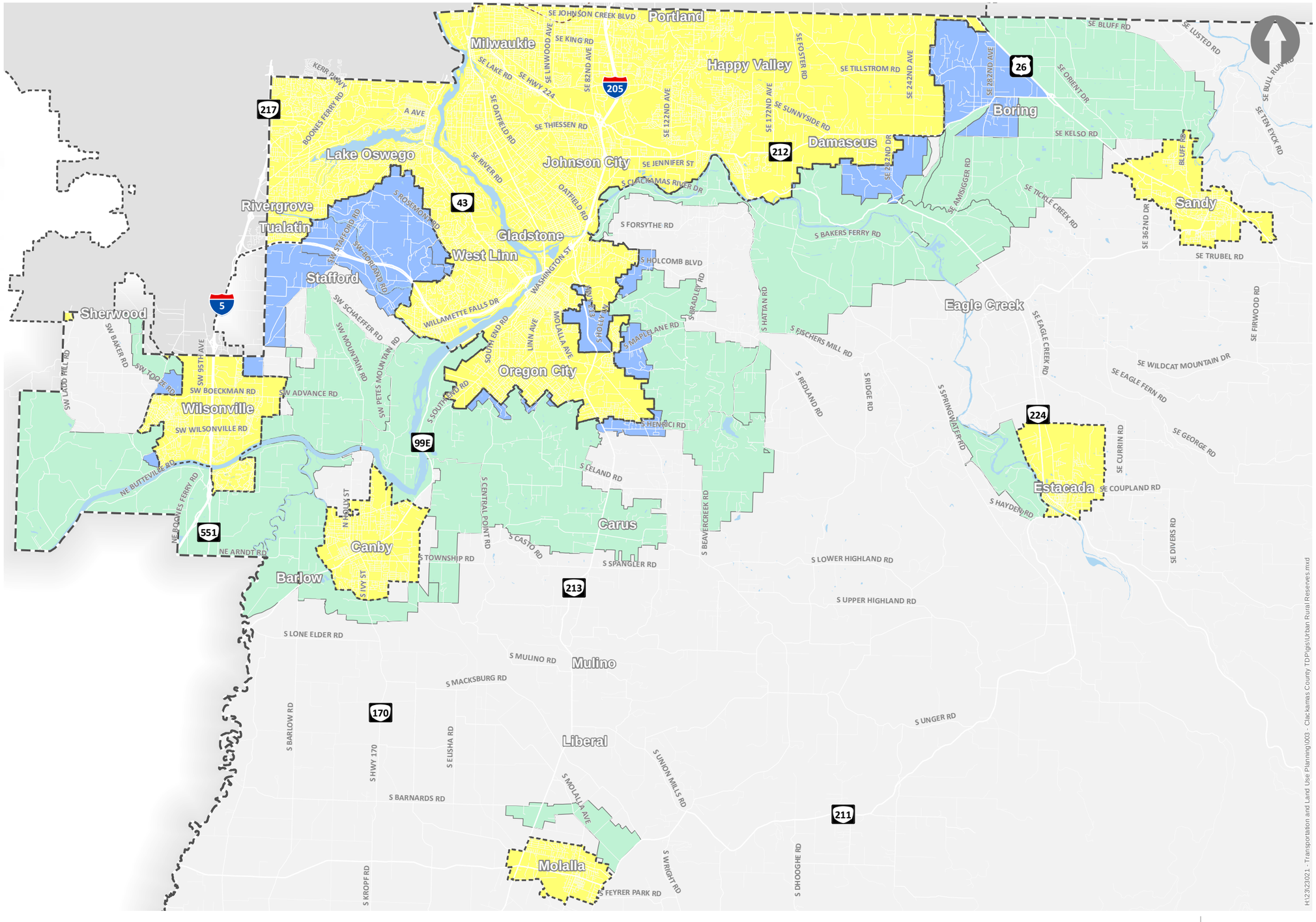
Within the Portland metropolitan UGB, there are several locations where urban development may be suitable, as Figure 11 shows. These are broadly divided into four areas: Wilsonville, Stafford, Oregon City and Damascus/Boring.

- Wilsonville: There are three small pockets of land bordering Wilsonville slated for future development: Grahams Ferry, Wilsonville Southwest, and Elligsen Road South.
- Stafford: To the northeast of Wilsonville, the Hamlet of Stafford and the surrounding unincorporated communities between Tualatin and West Linn are designated for urban development.
- Oregon City: Oregon City has five distinct areas to the south and east of the current city limits slated for urban development.
- Damascus/Boring: There are two areas to the south and east of Happy Valley slated for future urban development – an expansion of Damascus to the south of Highway 212 and the community of Boring along U.S. Highway 26.

CLACKAMAS COUNTY
TRANSIT DEVELOPMENT PLAN



- Urban Growth Boundaries
- Urban Reserves
- Rural Reserves
- County Boundary
- Metro UGB Outside of Clackamas County



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Urban and Rural Reserves
Clackamas County Transit Development Plan

Figure
11

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Outside of the Portland metropolitan UGB, Canby and Estacada have set up urban renewal districts to encourage development.

- Canby's urban renewal district runs along Highway 99E and includes the industrial district east of Highway 99E and the Logging Road Trail.
- Estacada's urban renewal district, located downtown on both sides of Highway 211, is intended to "encourage economic vitality and livability."

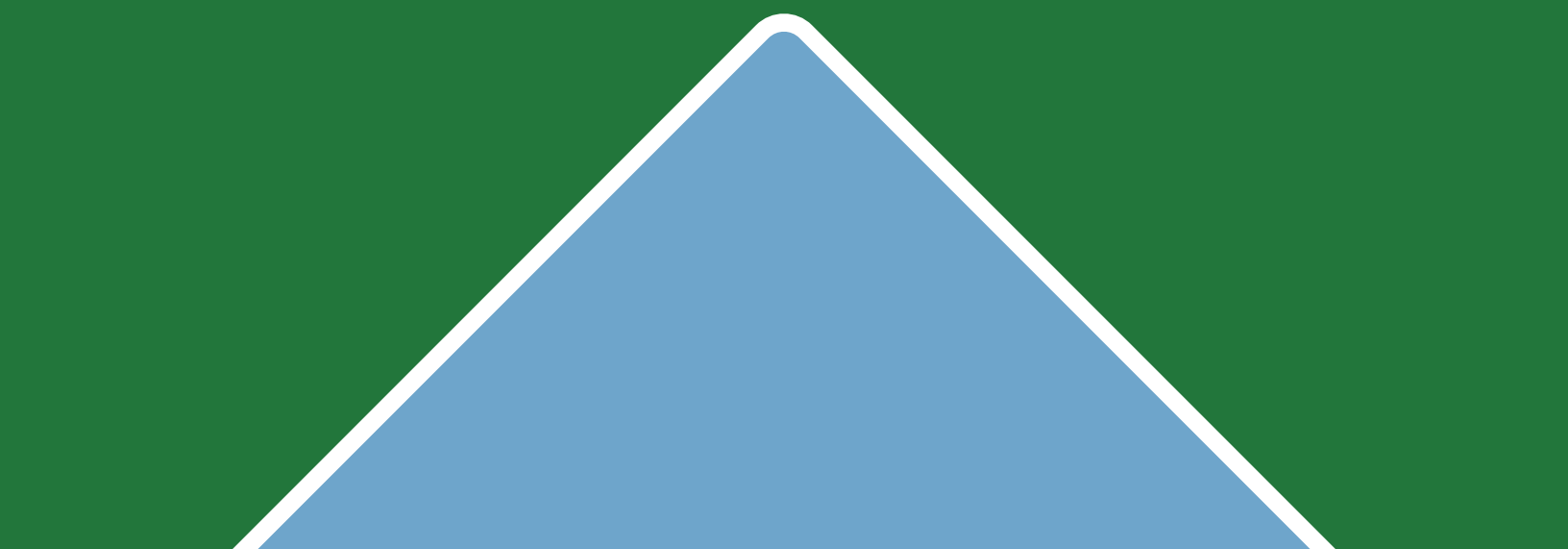
In 2017, the Oregon Department of Land Conservation and Development approved Sandy's application for a UGB expansion. The new UGB includes commercial-zoned land around the Highway 26/Orient Drive intersection, residential areas north and south of town, and new parkland by the Sandy River. The City maintains urban reserve land to the northwest and to the south of the new UGB.

The Clackamas County Transportation System Plan (TSP) identifies transportation infrastructure needs through the 20-year life of the plan.

- There is a high density of capital projects around Clackamas Town Center, the Clackamas Industrial Area, and in Happy Valley, signaling future county growth.
- The unincorporated community of Stafford, which is inside an urban reserve, has several capital projects with improved roadway connections to Lake Oswego, West Linn and Wilsonville.
- Other investments include improved connections between Canby and Molalla, between Oregon City and Happy Valley, and between Estacada and Boring.

NEEDS SUMMARY

- NEEDS RELATED TO EXISTING TRANSIT PERFORMANCE
- REFINEMENTS TO EXISTING ROUTES
- SERVICE ENHANCEMENTS AND EFFICIENCIES
- FUTURE SERVICE OPPORTUNITIES DEVELOPMENT AND EVALUATION



Needs Summary

This section summarizes the unmet transit needs within Clackamas County. These needs have been identified through a combination of:

- Applying findings from the *Reference D: Background Information and Existing Conditions Memorandum* and the project evaluation criteria from the *Reference C: Goals, Objectives, and Performance Measures Memorandum*;
- Reviewing previous regional planning documents for transit enhancements; and
- Analyzing gaps from the public engagement findings.

Additional information about the identified transit needs can be found in *Reference F: Needs Identification Memorandum.*

Needs Related to Existing Transit Performance

The *Goals, Objectives, and Performance Measures Memorandum* identified 10 evaluation criteria for the Clackamas County TDP. The following findings from the *Background Information and Existing Conditions Memorandum* were applied to the evaluation criteria:

Corridors and areas with multiple transit needs include I-205 between Oregon City and Tualatin, the future Clackamas to Columbia Corridor, and Oregon City.

- Intercommunity Connections: The following corridors/locations lack transit service or connectivity:
  - Highway 212 to Damascus and Boring,
  - Damascus–Gresham,
  - Happy Valley–Gresham,
  - Tualatin–West Linn–Oregon City, and
  - Highway 211 between Estacada–Molalla–Woodburn.
- Communities with Limited or No Transit Access:
  - Damascus, Boring, Estacada, and Eagle Creek have no local transit service.
  - Jennings Lodge, Oak Grove, and Oatfield are served by north-south transit routes, but have no east-west connections.
  - Happy Valley, which is served by TriMet Lines 155 and 156, has service concentrated primarily around Sunnyside Road, with much of the rest of the city having no transit access.
  - Similarly, the Clackamas Industrial Area is served by TriMet Line 33 along Highway 212 but has no last-mile service to the many employers in the area.
  - Estacada and Eagle Creek are served by TriMet Line 30, but portions remain beyond ¼ mile of service.
- Walking and Bicycling Access: Key areas with no pedestrian and bicycle access are urban and unincorporated communities without sidewalks or safe crossings, and rural highways without formal pedestrian and bicycle facilities, or shoulders that can be used as waiting areas and bus pullouts. Access to transit in rural areas can be increased by focusing improvements on pedestrian and bicycle facilities in unincorporated communities and along highways that have transit service.
- Service to Underrepresented Communities: The following areas with significant or concentrated underrepresented communities also lack transit service: Oregon City outskirts, areas around Canby, Eagle Creek, Jennings Lodge–Oak Grove–Oatfield, Happy Valley, and Damascus. Some

of these areas could be better served with more local service. Others, such as Eagle Creek, could use a park-and-ride with sidewalk and bicycle access to existing transit stops on Eagle Creek Road.

- Access to Jobs: There are few direct connections from Clackamas County to major employment areas in Gresham and Washington County, as well as few transit connections to the Clackamas Industrial Area and Wilsonville within Clackamas County. Future land use growth near Wilsonville / Stafford, Oregon City, and Damascus/Boring is anticipated to increase transit demand in these areas.
- Service on Regional Corridors: There is currently no transit service on several regional corridors, including Highway 212 between the Clackamas Industrial Area and Damascus/Boring, Interstate 205 between West Linn and Tualatin/Wilsonville, and Highway 211 between Molalla and Woodburn.
- Population Served: Transit-supportive areas without transit include the Clackamas Industrial Area, western West Linn, southern and western Oregon City, Damascus and the Clackamas to Columbia (C2C) Corridor, and southern Canby.
- Service Span and Frequency: Weekday service every 30 minutes or better is provided by 84% of all transit routes in the county, while 63% of all transit routes provide service at least 12 hours a day on weekdays. Not much weekend service is provided on intercommunity routes outside the TriMet district, especially on Sundays.
- Service Hours per Capita: Increases to service span, service frequency, or both can help improve transit service levels to residents of rural Clackamas County. Additionally, increased transit service in urban areas can raise Clackamas County service levels closer to those of neighboring Washington and Multnomah counties.
- System Ease of Use: There is no common fare system or fare reciprocity across Clackamas County transit providers, and few providers use real-time vehicle arrival technology. Improving the ease of fare payment and providing information such as real-time vehicle arrivals can improve the riding experience for existing riders and attract new riders. Technology such as automated passenger counters provides useful information for planning and operating service.

Potential needs for new transit corridors were identified primarily through evaluation criteria focused on intercommunity connections, communities with transit access, service for underrepresented communities, access to jobs, service on regional corridors, and population served. As shown in Table 10, nearly all of these needs were identified based on more than one evaluation criterion as well as other regional planning efforts and public outreach and feedback. Several of these needs could be addressed with one new service. For example, Damascus and Boring lack both local service and intercommunity connections. A new service between these and other communities might address the needs for local travel as well as regional connections. Table 10 also identifies the primary transit district where the corridor is located, or notes N/A where a corridor extends between multiple transit districts.

Addressing these needs will require considering the type of transit service best suited to the need. Many needs can be met through traditional fixed-route local or intercity services. However, other needs have markets, such as commuters/employment and lower-density communities, that may better benefit from other types of services, such as commuter shuttles, last-mile shuttles, or vanpools. These considerations are addressed later in this memorandum in the *Future Service Opportunities and Prioritization* section.

The needs in some new corridors could be met by extending or modifying existing routes. Potential extensions are considered in the *Refinements to Existing Routes* section, below.

Table 10. New Corridor Needs

Service Type	Transit District	Potential Service	Intercommunity Connections	Communities with Transit Access	Underrepresented Communities	Access to Jobs	Service on Regional Corridors	Population Served	Identified in TriMet/Metro Plan	Public Outreach
New Regional Connections	N/A	Damascus and Boring on Highway 212 and/or Sunnyside	X			X	X			X
	N/A	Estacada, Molalla, and Woodburn on Highway 211	X				X			
	N/A	Estacada, Redland, and Oregon City							X	
	TriMet	Tualatin, West Linn, and Oregon City on I-205	X			X	X	X	X	X
	TriMet	West Linn, Lake Oswego, and Washington County							X	X
	TriMet	Enhanced Transit Corridors on Cesar Chavez and 82nd Avenue			X				X	
	TriMet – N/A*	Damascus, Happy Valley, and Gresham on the future C2C Corridor	X			X	X	X	X	
New Local Service	N/A	Damascus		X	X	X				
	N/A	Boring		X		X				
	TriMet	Estacada and Eagle Creek		X	X					
	TriMet	Clackamas Industrial Area		X		X		X	X	
	TriMet	Jennings Lodge–Oak Grove–Oatfield		X	X					
Additional Transit Service	TriMet	Happy Valley		X	X				X	
	TriMet	Oregon City			X	X		X	X	X
	CAT	Canby			X			X		
	SMART	Wilsonville				X				

* The future C2C Corridor includes areas that are in TriMet's service district and areas (such as Damascus) that are not.

Refinements to Existing Routes

Potential needs for new service areas may be addressed by refinements to existing routes, which could include:

- Extending the Mt. Hood Express from Sandy along Highway 212 to connect Damascus, Boring, and the Clackamas Industrial Area to Clackamas Town Center.
- Extending TriMet Line 87 along the future C2C Corridor on SE 172nd Avenue and SE 190th Avenue, to connect Damascus, Happy Valley, and Gresham.
- Increasing service TriMet Line 156 as identified in TriMet's Southeast Service Enhancement Plan.
- Modifications to TriMet Lines 32, 33, or 99, or SCTD's Molalla to CCC route could serve additional areas in Oregon City. (*Note: the Oregon City First/Last-Mile Shuttle is expected to meet some of these needs and is anticipated to be implemented by the end of 2020.)*
- Generally, route modifications can provide additional connections to and from:
  - Employment areas

- Food banks, homeless shelters, and other social services
- Medical facilities
- Human service agencies
- Retirement and assisted living centers
- Affordable housing, such as those funded through the Metro Affordable Housing Bond (Fuller Street Station at 9608 SE Fuller Rd, Happy Valley; Maple Apartments at 14338 S. Maple Lane Ct, Oregon City, and Good Shepard Village at12596 Se 162nd Ave, Happy Valley)

Service Enhancements and Efficiencies

Potential needs for service enhancements were largely identified through the service span and frequency, service hours per capita, walking and bicycling access, and system ease of use evaluation criteria. These include the following:

- Adding weekend service to locations that are not currently served on weekends.
- Increasing route frequencies to locations where there are higher proportions of passenger vehicle trips compared to one-way transit trips.
- Providing bus service earlier in the morning and later in the evening on all transit routes.
- Improving coordination between transit providers, especially in such operational areas as system integration, fares, timetables, transportation planning, and trip planning applications.
- Increasing schedule reliability and efficiency through coordination between transit providers.
- Making transit easier to access via online tools and public information campaigns.
- Improving access to/from and within transit stops and bus terminals.
  - These improvements can also alleviate the need for local transit service in communities for those able to walk or bike to transit stops.
  - For example, bus stop improvements at the intersection of Eagle Creek Road and Highway 211 and sidewalk and bicycle improvements in this vicinity can make for a safer, more comfortable first- or last-mile to SAM's Sandy–Estacada route and TriMet Line 30.
- Improving bus stops with signage, benches, illumination, and/or shelters.
- Working with local jurisdictions to identify potential developer-funded transit sites (e.g., bus stops and related amenities such as sidewalks), especially those serving residential developments, employment sites, commercial properties, and/or educational facilities.
- Considering bus-on-shoulder operations or dedicated transit facilities on congested corridors, improving transit travel time and elevating transit as a competitive alternative to driving.
- Implementing formal and informal park-and-ride and bike-and-ride facilities at major transit stops and along rural highways.
- TriMet's Service Enhancement Plan identifies additional route adjustments and additions:
  - A new route connecting Clackamas Town Center, Milwaukie, and Washington Square Transit Center via the Sellwood Bridge.

- A new route between 172nd Avenue and Oregon City that serves Johnson City and Jennings Lodge.
- Upgrading Line 35 on Highway 43 to a frequent service route.
- A new route on Rosemont Road between Lake Oswego and West Linn.

Figure 12 and Figure 13 summarize the identified transit needs across Clackamas County.

CLACKAMAS COUNTY
TRANSIT DEVELOPMENT PLAN

- Transit-Supportive Areas Without Transit
- Transportation Disadvantaged Populations
- Major Job Centers
- Future Land Use Growth Areas
- Communities Without Local Transit Service
- Transit Needs Identified in TriMet and Metro Regional Plans
- Intercommunity Corridors With No Transit Service
- Regional Corridors With No Transit Service
- Existing Transit Service
- Urban Growth Boundaries
- County Boundary

0 5 Miles

Needs Identification Map
Clackamas County Transit Development Plan

Figure
12

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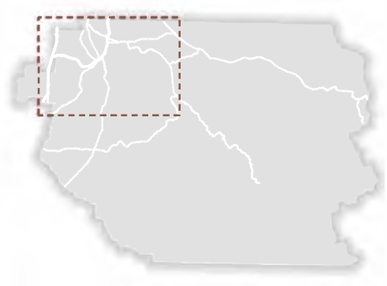
CLACKAMAS COUNTY
TRANSIT DEVELOPMENT PLAN



- Transit-Supportive Areas Without Transit
- Transportation Disadvantaged Populations
- Major Job Centers
- Future Land Use Growth Areas
- Communities Without Local Transit Service
- Transit Needs Identified in TriMet and Metro Regional Plans
- Intercommunity Corridors With No Transit Service
- Regional Corridors With No Transit Service
- Existing Transit Service
- Urban Growth Boundaries
- County Boundary

0 3 Miles

Needs Identification Map
Clackamas County Transit Development Plan

Figure
13

Future Service Opportunities Development and Evaluation

The corridors and areas with the biggest increase in transit demand include the Clackamas Industrial Area, Highway 43, I-205 west of Oregon City, and Oregon City.

Using the Needs Summary as a starting point, the TDP project team analyzed transit demand on existing transit corridors, commute demand on arterials and highways, and current and projected land use demand from the TSA analysis. These findings translated the identified transit needs into a total number of added transit runs on a corridor. Table 11 catalogs the existing runs, additional runs needed, and total recommended transit runs, as well as adding service span and service frequency changes to meet any increased transit demand.

Figure 14 and Figure 15 show where additional transit runs are needed based on the findings in Table 11. For example, Highway 43 between Oregon City and Portland has the highest additional demand at 48 more transit runs to meet recommended thresholds. Conversely, I-205 from Clackamas Town Center toward Portland already has frequent service via the MAX Green Line and is not recommended for increased transit service. Further information can be found in *Reference G: Future Solutions Strategies Memorandum.*

Table 11. Additional Transit Runs to Meet Recommended Service Level Threshold

Corridor or Area	Existing Runs per Day	Additional Transit Run Demand	Total Recommended Transit Runs	Recommended Service Span and Frequency Changes
Clackamas Industrial Area	22	50	72	Implement local service at 15–30 minute headways
Highway 43: Oregon City to Portland	47	48	95	Improve headways from 30 minutes to 15 minutes
I-205: Oregon City to I-5 Interchange	0	47	47	Implement service at 20–30 minute headways
Oregon City (South and West)	0	44	44	Implement local service at 30-minute headways
Milwaukie Industrial Area	33	31	64	Implement local service at 30-minute headways
West Lake Oswego/Kruse Way	12	20	32	Increase service beyond peak periods
I-205: Oregon City to Clackamas Town Center	69	18	87	Improve headways to 15-20 minutes
Wilsonville (West Wilsonville)	16	19	35	Increase service beyond peak periods
Happy Valley	16	19	35	Implement hourly or better service
Canby (North and South)	16	19	39	Implement hourly or better service
Damascus	0	19	19	Implement hourly or better service
Jennings Lodge and Oak Grove East-West	0	16	16	Implement hourly or better service
Highway 99E: Oregon City to Canby	26	14	40	Increase frequency and/or expand operating hours
Highway 212: I-205 to US 26	0	14	14	Implement hourly or better service
Highway 99E: Oregon City to Portland	84	11	95	Increase frequency and/or expand operating hours
Estacada–Redland–Oregon City	0	11	11	Implement hourly service (focused on the CCC schedule)
Highway 211: Molalla to Woodburn	0	10	10	Implement hourly service
C2C Corridor	0	10	10	Implement hourly service

Corridor or Area	Existing Runs per Day	Additional Transit Run Demand	Total Recommended Transit Runs	Recommended Service Span and Frequency Changes
Highway 213: South of Molalla	0	8	8	Implement hourly service
Boring	0	8	8	Cover with Damascus service
East Tualatin	0	8	8	Cover with I-205 Oregon City to I-5 service
US 26: West of Sandy	33	3	36	Extend service hours
Estacada and Eagle Creek	27	0	27	Cover with Estacada–Redland–Oregon City fixed-route or with SAM Sandy & Estacada existing service
I-205: Clackamas Town Center toward Portland	85	0	85	Monitor needs for potential increases to transit demand
Highway 224: Highway 212 to Estacada	27	0	27	
Highway 213: Oregon City to Molalla	24	0	24	
Highway 99E: South of Canby	14	0	14	
US 26: East of Sandy	15	0	15	

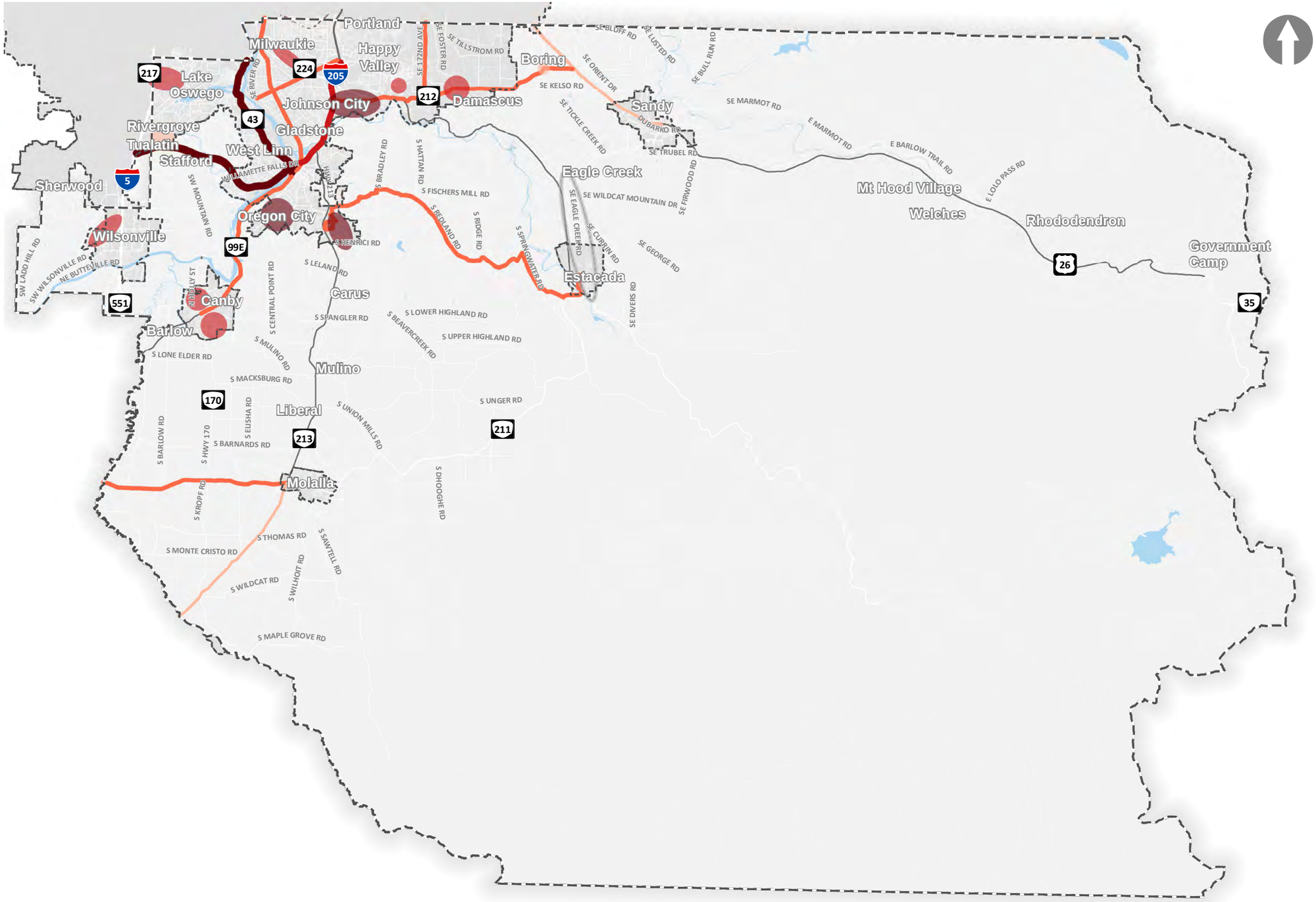
CLACKAMAS COUNTY
TRANSIT DEVELOPMENT PLAN

Additional Runs: Areas

- No Additional Runs
- 8 or Fewer Runs per Day
- 9 - 16 Runs per Day
- 17 - 32 Runs per Day
- 33 - 64 Runs per Day

Additional Runs: Corridors

- No Additional
- 8 or Fewer Runs per Day
- 9 - 16 Runs per Day
- 17 - 32 Runs per Day
- 33 - 64 Runs per Day
- Urban Growth Boundaries
- County Boundary



0 5 Miles

Additional Transit Demand
Clackamas County Transit Development Plan

Figure
14

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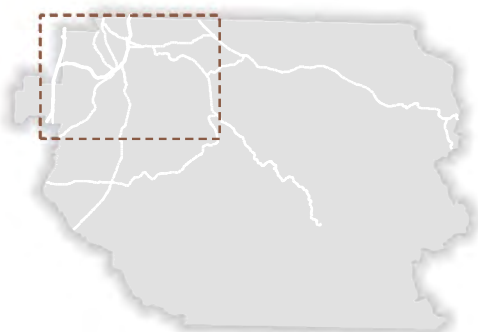
CLACKAMAS COUNTY
TRANSIT DEVELOPMENT PLAN

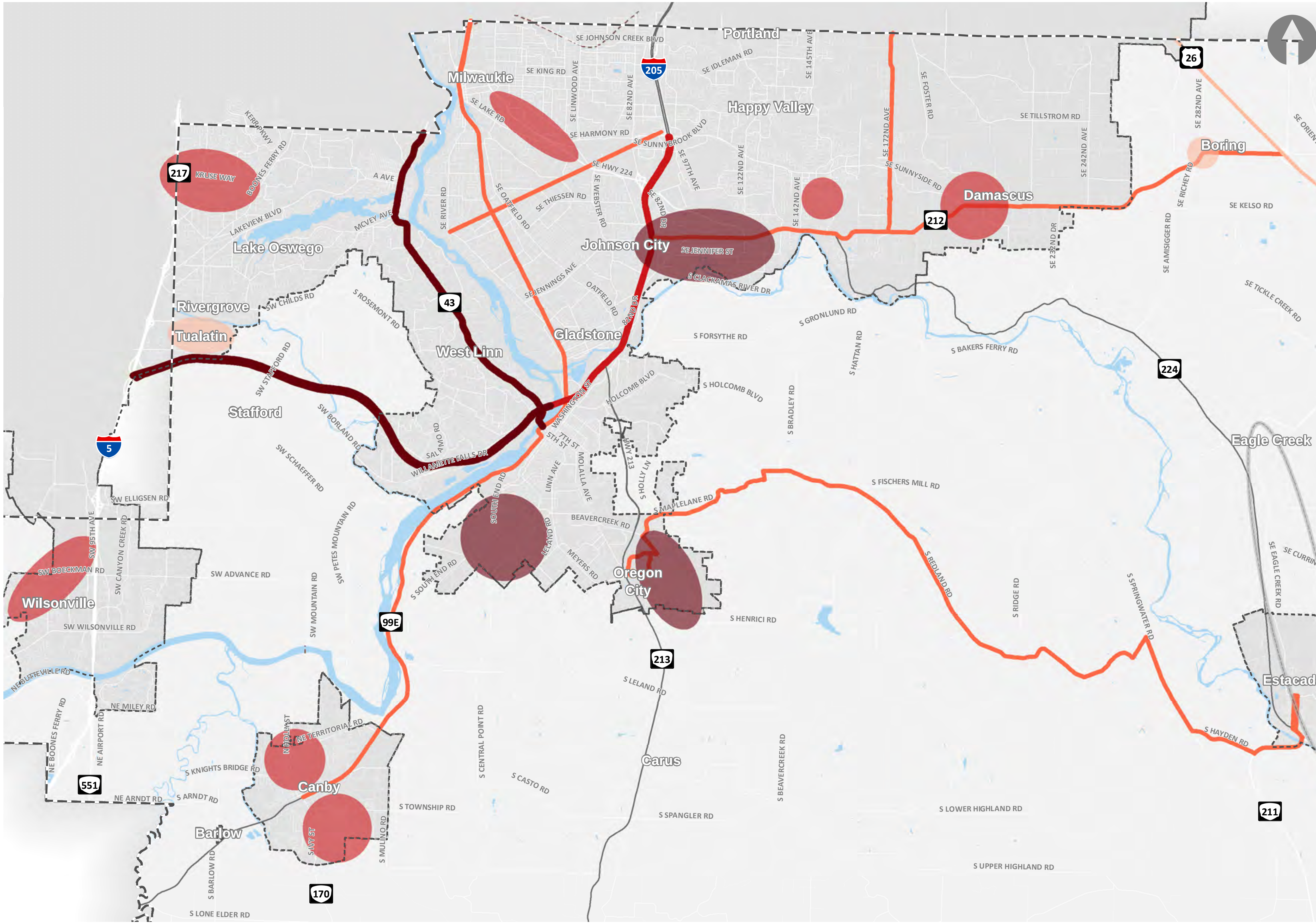


Additional Runs: Areas

- No Additional Runs
- 8 or Fewer Runs per Day
- 9 - 16 Runs per Day
- 17 - 32 Runs per Day
- 33 - 64 Runs per Day

Additional Runs: Corridors

- No Additional
- 8 or Fewer Runs per Day
- 9 - 16 Runs per Day
- 17 - 32 Runs per Day
- 33 - 64 Runs per Day
- Urban Growth Boundaries
- County Boundary

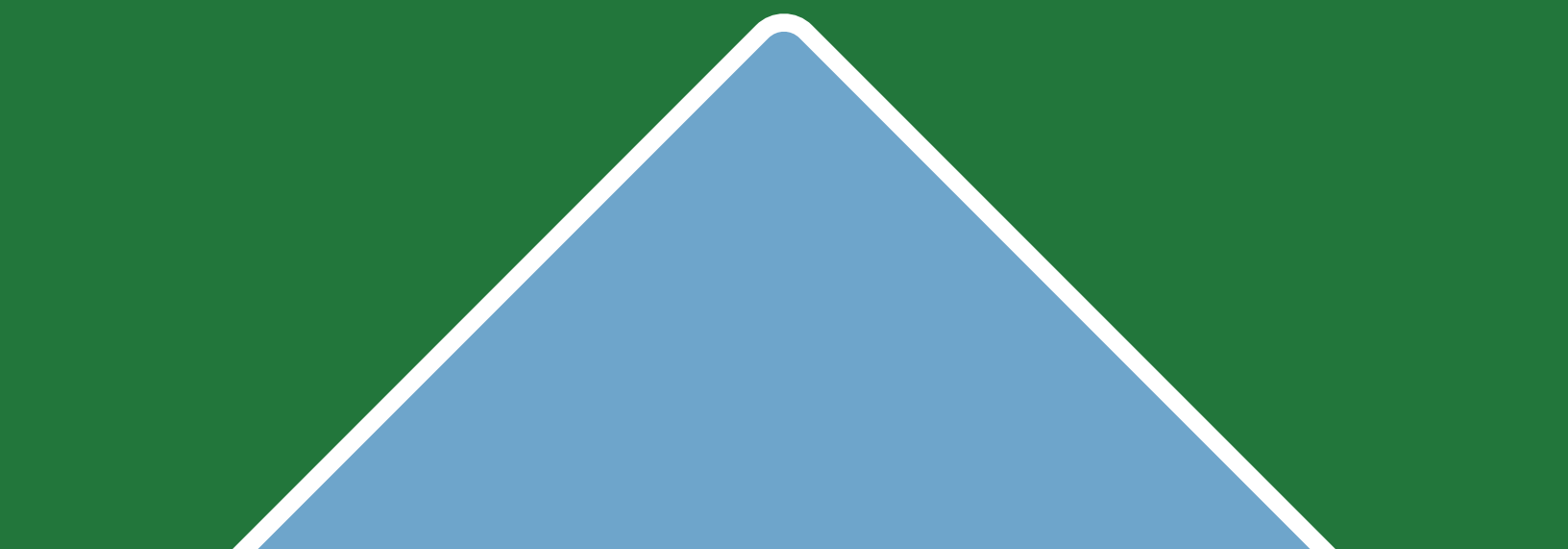


0 3 Miles

Additional Transit Demand
Clackamas County Transit Development Plan

Figure
15

FUTURE SERVICE NETWORK AND PRIORITIZATION



Future Service Network and Prioritization

This section categorizes the future service opportunities into short-term, medium-term, and long-term recommendations. Further details on routing options and routing recommendations are included in *Reference G: Future Solutions Strategies Memorandum*.

Short-Term Recommendations

Short-term recommendations include adding service along Highway 43 and between Oregon City and Portland and parallel service along Rosemont Road, establishing service along the I-205 corridor from Oregon City to Tualatin, and in the Milwaukie Industrial Area.

Table 12 lists the transit corridor or area with the short-term recommendation and additional considerations. Figure 16, Figure 17, and Figure 18 show the full county transit network with the short-term recommendations.

Two Clackamas County shuttle routes are set to be implemented around the beginning of 2021. These two shuttle routes are shown in the figures but are not shown in Table 12 given that they are set to be implemented near the end of the Clackamas County TDP project.

Table 12. Short-Term Recommendations

ID	CORRIDOR OR AREA	EXISTING RUNS PER DAY	ADDITIONAL TRANSIT RUN DEMAND	RECOMMENDATION	DISTRICT / PROVIDER	VEHICLE SIZE	STATUS
ST-1	Highway 43: Oregon City to Portland	47	48	Implement 15-minute service on Line 35, new service on Rosemont Road	TriMet	Larger	In Provider Plan
ST-2	I-205: Oregon City to I-5 Interchange	0	47	Implement hourly local service via Ride Connection's Borland Road service and hourly express service on I-205 (Option D1) (about 28 runs per day total)	Borland Road: Ride Connection Wilsonville – CTC: SMART (potential) Tualatin – CTC: TriMet (potential)	Smaller and/or Larger	In Provider Plan
ST-3	East Tualatin	0	8	Hourly service provided by Ride Connection route	Borland Road: Ride Connection	Smaller	In Planning Phase
ST-4	Jennings Lodge-Oak Grove-Oatfield	0	16	New hourly Happy Valley–Oregon City Service (about 8 runs per day): Triggers Mobility Hub in Clackamas Industrial Area and in Happy Valley	TriMet	Larger	In Provider Plan
ST-5	Milwaukie Industrial Area	33	31	Implement hourly shuttle service: expand Line 152 service hours (about 12 runs per day)	Likely a Pass-Through Funded Shuttle	Smaller	Feasibility Study Underway

Medium-Term Recommendations

The medium-term recommendations continue to expand service along the I-205 corridor, in the Clackamas Industrial Area and Milwaukie Industrial Area, and in the southern and western areas of Oregon City. In addition, medium-term recommendations include expanding service along Kruse Way, in West Wilsonville, Happy Valley, Canby, and Highway 99E between Oregon City and Canby; providing east–west service for Oak Grove and Oatfield; and establishing service in Damascus and along the Highway 212 corridor.

Table 13 lists the transit corridor or area with the mid-term recommendations and additional considerations. Figure 19, Figure 20, and Figure 21 show the full county transit network with the mid-term recommendations.

Long-Term Recommendations

The long-term recommendations continue to expand service in corridors and areas highlighted in the short-term and medium-term recommendations. In addition, the long-term recommendations include expanding service on Highway 99E between Oregon City and Portland and on US 26 west of Sandy, and establishing new service in Boring, east Tualatin, along the Clackamas to Columbia Corridor, on Highway 211 between Molalla and Woodburn, and on Highway 213 south of Molalla.

Table 14 lists the transit corridor or area with the long-term recommendations and additional considerations. Figure 22, Figure 23, and Figure 24 show the full county transit network with the long-term recommendations.

What is a Mobility Hub?

A mobility hub is a place that connects different travel options – typically walking, biking, transit, and shared mobility – in a single place to support first-mile, last-mile connectivity and to create activity centers for a community.

Mobility hubs are usually centered around places with higher transit density where more comprehensive stop amenities (such as shelters, restrooms, and bike lockers) may be found. The transportation infrastructure usually includes a higher number of bus bays than a typical bus stop, as well as connections to shared mobility services such as carshare or bikeshare. Mobility hubs are most successful in a higher density environment, at major activity centers, and/or near affordable housing.

Building mobility hubs will need to be a coordinated effort between Clackamas County, the relevant transit providers, and the local jurisdictions. Transit providers will need to coordinate bus transfers and space availability. The County and local jurisdictions will need to establish policy that supports mobility hubs, improve walking and biking access where needed, and coordinate land use planning to increase density at hub locations.

In the meantime, it is important that local jurisdictions define mobility hubs in their code to allow construction and create new permitting processes for mobility hubs and supportive services. It is equally important that local jurisdictions permit any new mobility modes, such as bikeshare and scootershare, that can enhance a mobility hub.

Table 13. Medium-Term Recommendations

ID	CORRIDOR OR AREA	EXISTING RUNS PER DAY	ADDITIONAL TRANSIT RUN DEMAND	RECOMMENDATION	DISTRICT / PROVIDER	VEHICLE SIZE	STATUS
MT-1	I-205: Oregon City to I-5 Interchange	14	33	Evaluate service; consider increased service span and frequency to add runs to service	TriMet Pass-Through Funded	See short-term for details	Adding trips from short-term
MT-2	Milwaukie Industrial Area	45	19				
MT-3	I-205: Oregon City to Clackamas Town Center	69	18	Implement 20-minute headways on Line 79 (about 50 runs per day)	TriMet	Larger	In Provider Plan
MT-4	West Lake Oswego/ Kruse Way	12	20	Expand service hours beyond peak periods and improve headways to 30 minutes during AM peak hour (about 10 runs per day)	TriMet	Larger	In Provider Plan
MT-5	Wilsonville (West Wilsonville)	16	19	Expand service hours beyond peak periods per SMART's Transit Master Plan (about 10 runs per day)	SMART	Smaller and/or Larger	In Provider Plan
MT-6	Happy Valley	16	19	Establish hourly service (about 10 runs per day)	TriMet	Larger	Established Need
MT-7	Canby (North and South)	16	19	Implement local service as established in CAT's Master Plan (about 10 runs per day)	CAT	Smaller	In Provider Plan
MT-8	Jennings Lodge-Oak Grove-Oatfield	8	8	Establish hourly service from Oak Grove (about 8 runs per day)	TriMet	Dependent on Topography	Established Need
MT-9	Damascus	0	19	Establish hourly service (about 10 runs per day)	TBD	Smaller	Established Need
	Boring	0	8	Hourly service provided by Damascus deviated fixed-route	TBD	Smaller	Established Need
MT-10	Highway 99E: Oregon City to Canby	26	14	Establish 30-minute headways during the entire day (about 8 runs per day)	CAT	Larger	In Provider Plan
MT-11	Highway 212: I-205 to US 26[1]	0	14	Establish hourly service (about 8 runs per day); triggers Mobility Hub in Boring	SAM	Larger	In Provider Plan
MT-12	Estacada-Redland-Oregon City	0	11	Establish hourly service focused on the CCC schedule (about 11 runs per day)	TBD	Smaller	Established Need

1 Partially within identified service district/provider

Table 14. Long-Term Recommendations

ID	CORRIDOR OR AREA	EXISTING RUNS PER DAY	ADDITIONAL TRANSIT RUN DEMAND	RECOMMENDATION	DISTRICT / PROVIDER	VEHICLE SIZE	STATUS
LT-1	I-205: Oregon City to I-5 Interchange	31	16	Evaluate service; consider increased service span and frequency to add about 10 runs per day.	See short-term and mid-term for details	See short-term and mid-term for details	Adding trips from short-term and mid-term
LT-2	Milwaukie Industrial Area	55	9				
LT-3	I-205: Oregon City to Clackamas Town Center	84	3				
LT-4	West Lake Oswego/ Kruse Way	22	10				
LT-5	Wilsonville (West Wilsonville)	26	9				
LT-6	Happy Valley	26	9				
LT-7	Canby (North and South)	26	9				
LT-8	Damascus	10	9				
LT-9	Highway 99E: Oregon City to Canby	34	6				
LT-10	Highway 212: I-205 to US 26	8	6				
LT-11	Highway 99E: Oregon City to Portland	84	11	Add 11 runs per day on Line 99, maintain existing 20-minute headways with extended service hours	TriMet	Larger	Established Need
LT-12	Highway 211: Molalla to Woodburn[1]	0	10	Establish hourly service	SCTD	Smaller	In Provider Plan
LT-13	C2C Corridor[1]	0	10	Establish hourly service	TriMet	Larger	Future Need
LT-14	Highway 213: South of Molalla[1]	0	8	Establish hourly service	SCTD	Smaller	In Provider Plan
LT-15	US 26: West of Sandy	33	3	Add 3 runs per day, maintain 30-minute headways with extended service hours	SAM	Larger	In Provider Plan
N/A	Estacada and Eagle Creek	Covered by SAM's Sandy & Estacada service; consider mobility hub in Eagle Creek			SAM	Larger	In Provider Plan
N/A	I-205: North of Clackamas Town Center	Monitor potential increases to transit demand			N/A	N/A	N/A
N/A	Highway 224: Highway 212 to Estacada						
N/A	Highway 213: Oregon City to Molalla						
N/A	Highway 99E: South of Canby						
N/A	US 26: East of Sandy						
N/A	Boring						

1 Partially within identified service district/provider

CLACKAMAS COUNTY
TRANSIT DEVELOPMENT PLAN

Short-Term Recommendations: Routes

- 8 or Fewer Runs per Day
- 9 - 16 Runs per Day
- 17 - 32 Runs per Day
- 33 - 64 Runs per Day
- 65 or More Runs per Day

Short-Term Recommendations: Areas

- 9 - 16 Runs per Day

Planned Services

- Wilsonville to Clackamas Town Center
- Tualatin Shuttle (New)
- Mobility Hub
- Transit Centers
- Park and ride lots
- Urban Growth Boundaries
- County Boundary

0 5 Miles

Short-Term Recommendations
Clackamas County Transit Development Plan

Figure
16

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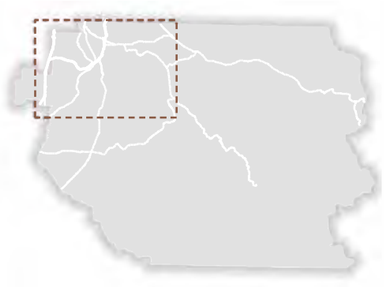
CLACKAMAS COUNTY
TRANSIT DEVELOPMENT PLAN



Short-Term Recommendations: Routes

- 8 or Fewer Runs per Day
- 9 - 16 Runs per Day
- 17 - 32 Runs per Day
- 33 - 64 Runs per Day
- 65 or More Runs per Day

Short-Term Recommendations: Areas

- 9 - 16 Runs per Day

Planned Services

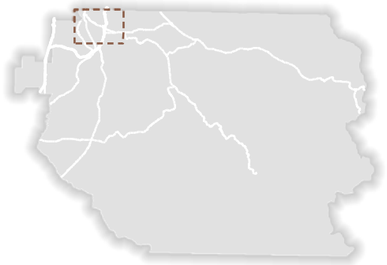
- Wilsonville to Clackamas Town Center
- Tualatin Shuttle (New)
- Mobility Hub
- Transit Centers
- Park and ride lots
- Urban Growth Boundaries
- County Boundary

0 3 Miles

Short-Term Recommendations
Clackamas County Transit Development Plan

Figure
17

CLACKAMAS COUNTY
TRANSIT DEVELOPMENT PLAN



Short-Term Recommendations: Routes

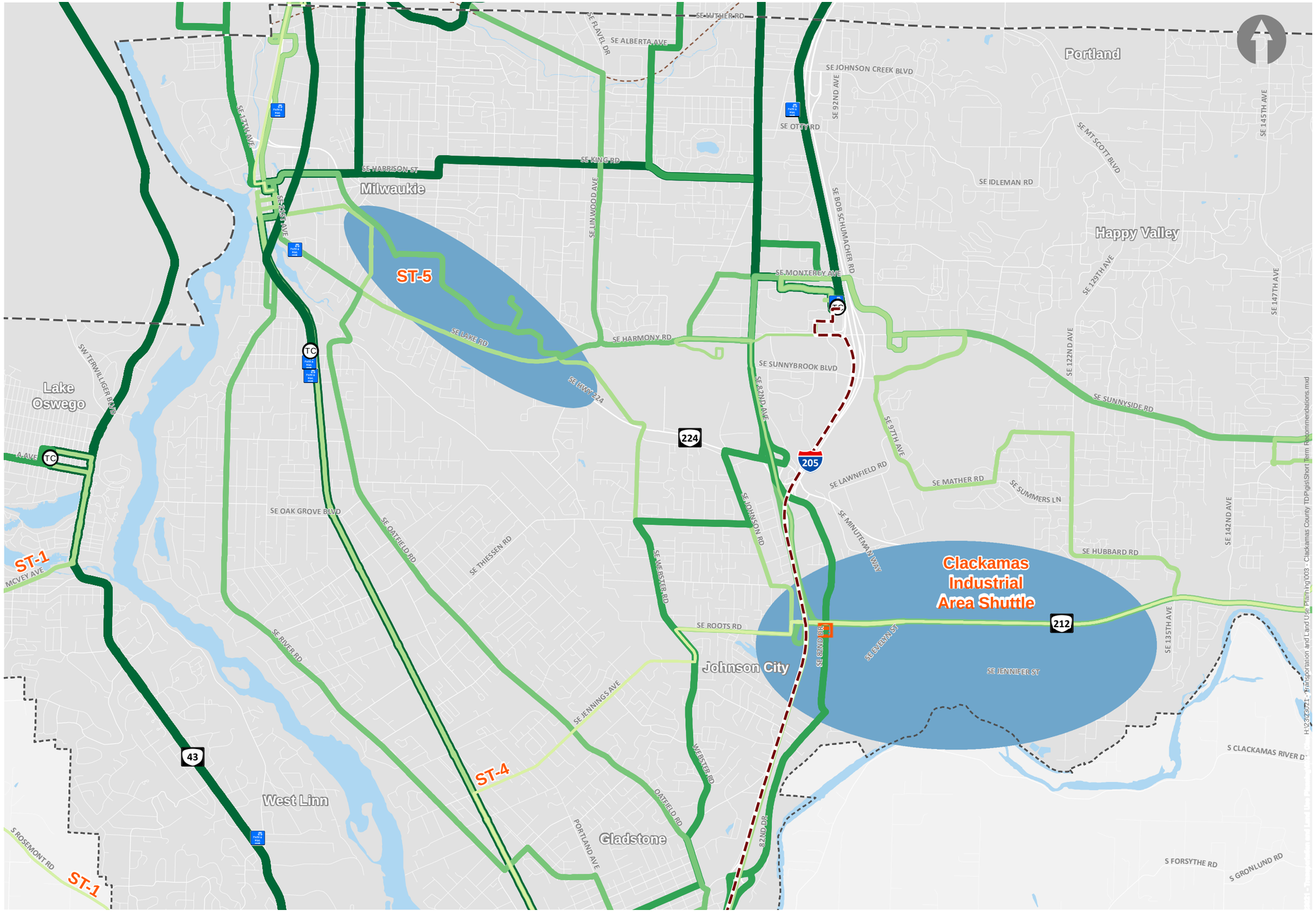
- 8 or Fewer Runs per Day
- 9 - 16 Runs per Day
- 17 - 32 Runs per Day
- 33 - 64 Runs per Day
- 65 or More Runs per Day

Short-Term Recommendations: Areas

- 9 - 16 Runs per Day

Planned Services

- Wilsonville to Clackamas Town Center
- Tualatin Shuttle (New)
- Mobility Hub
- Transit Centers
- Park and ride lots
- Urban Growth Boundaries
- County Boundary



0 1 Miles

Short-Term Recommendations
Clackamas County Transit Development Plan

Figure
18

CLACKAMAS COUNTY
TRANSIT DEVELOPMENT PLAN

Medium-Term Recommendations: Routes

- 8 or Fewer Runs per Day
- 9 - 16 Runs per Day
- 17 - 32 Runs per Day
- 33 - 64 Runs per Day
- 65 or More Runs per Day

Medium-Term Recommendations: Areas

- 9 - 16 Runs per Day
- 17 - 32 Runs per Day

Planned Services

- Wilsonville to Clackamas Town Center
- Tualatin Shuttle (New)
- Mobility Hub
- Transit Centers
- Park and ride lots
- Urban Growth Boundaries
- County Boundary

0 5 Miles

Medium-Term Recommendations
Clackamas County Transit Development Plan

Figure
19

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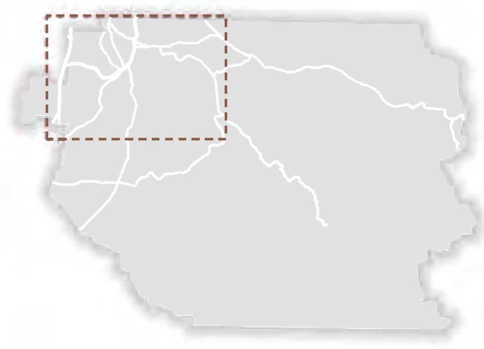
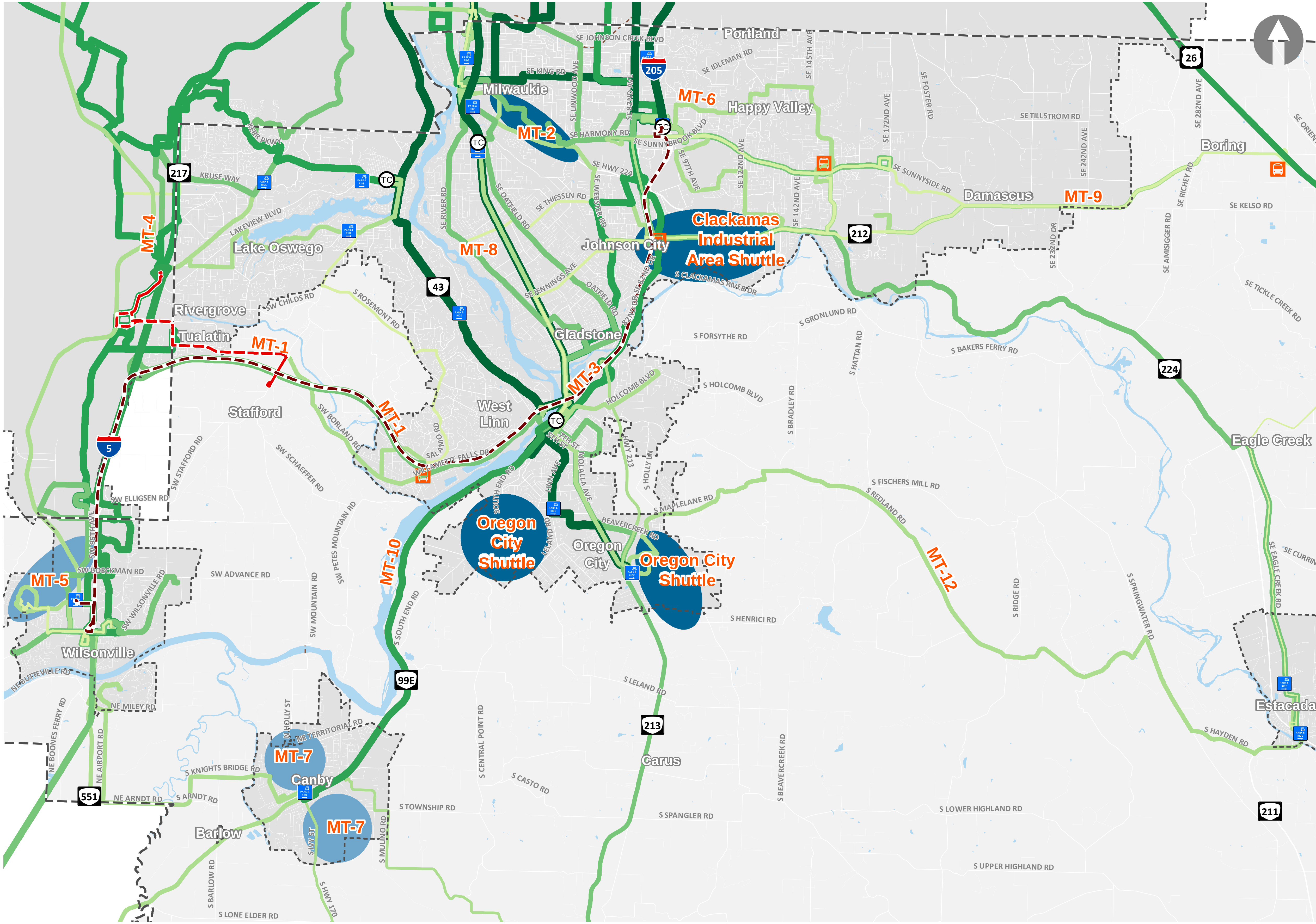




Medium-Term Recommendations: Routes

- 8 or Fewer Runs per Day
- 9 - 16 Runs per Day
- 17 - 32 Runs per Day
- 33 - 64 Runs per Day
- 65 or More Runs per Day

Medium-Term Recommendations: Areas

- 9 - 16 Runs per Day
- 17 - 32 Runs per Day

Planned Services

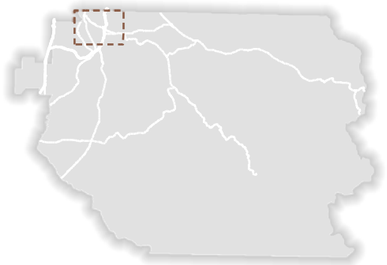
- Wilsonville to Clackamas Town Center
- Tualatin Shuttle (New)
- Mobility Hub
- Transit Centers
- Park and ride lots
- Urban Growth Boundaries
- County Boundary

0 3 Miles

Medium-Term Recommendations
Clackamas County Transit Development Plan

Figure 20

CLACKAMAS COUNTY
TRANSIT DEVELOPMENT PLAN



Medium-Term Recommendations: Routes

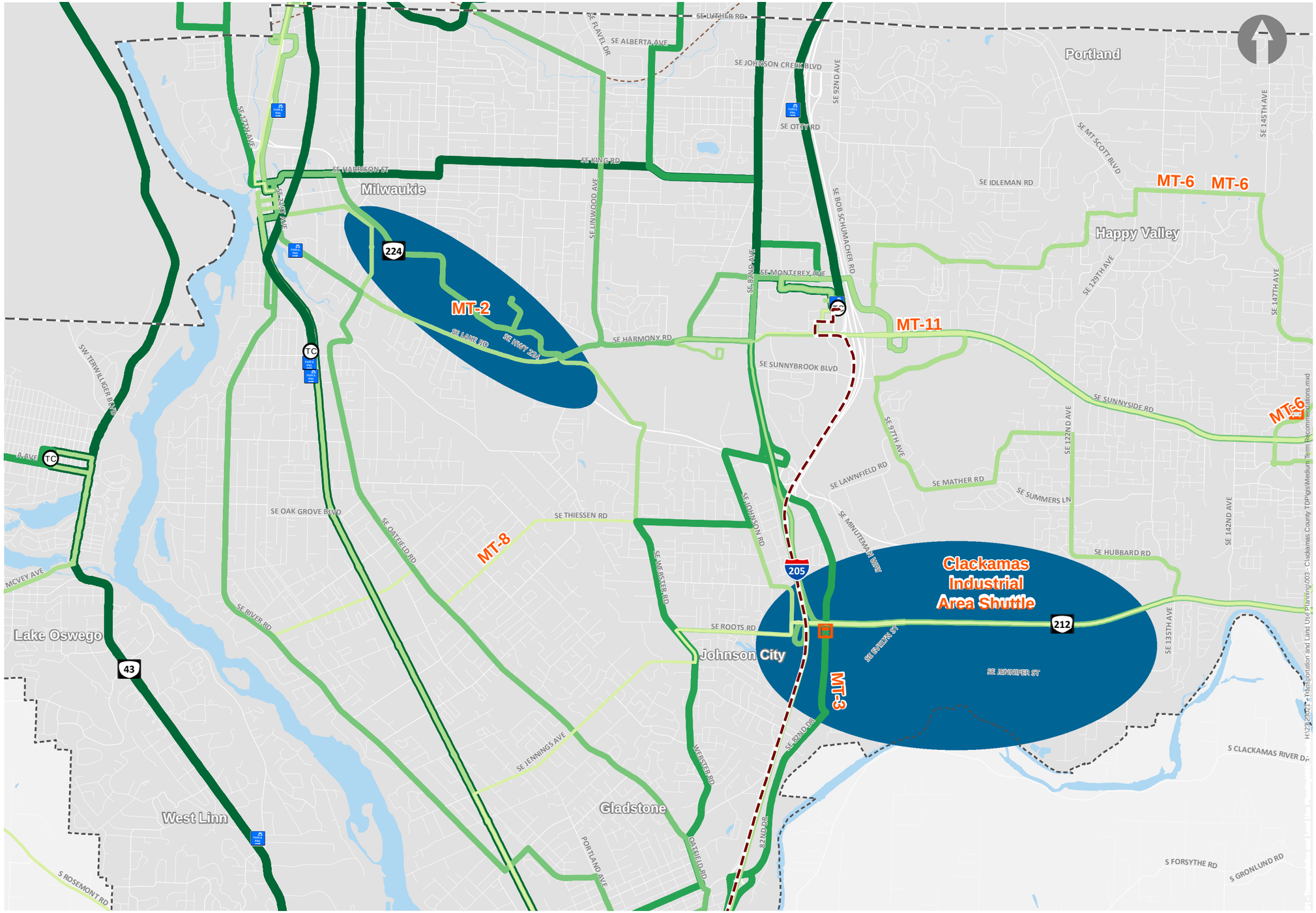
- 8 or Fewer Runs per Day
- 9 - 16 Runs per Day
- 17 - 32 Runs per Day
- 33 - 64 Runs per Day
- 65 or More Runs per Day

Medium-Term Recommendations: Areas

- 9 - 16 Runs per Day
- 17 - 32 Runs per Day

Planned Services

- Wilsonville to Clackamas Town Center
- Tualatin Shuttle (New)
- Mobility Hub
- Transit Centers
- Park and ride lots
- Urban Growth Boundaries
- County Boundary



0 1 Miles

Medium-Term Recommendations
Clackamas County Transit Development Plan

Figure
21

CLACKAMAS COUNTY
TRANSIT DEVELOPMENT PLAN

Long-Term Recommendations: Routes

- 8 or Fewer Runs per Day
- 9 - 16 Runs per Day
- 17 - 32 Runs per Day
- 33 - 64 Runs per Day
- 65 or More Runs per Day

LongTermTrips

- 9 - 16 Runs per Day
- 17 - 32 Runs per Day

Planned Services

- Wilsonville to Clackamas Town Center
- Tualatin Shuttle (New)
- Mobility Hub
- Transit Centers
- Park and ride lots
- Urban Growth Boundaries
- County Boundary

0 5 Miles

Long-Term Recommendations
Clackamas County Transit Development Plan

Figure
22

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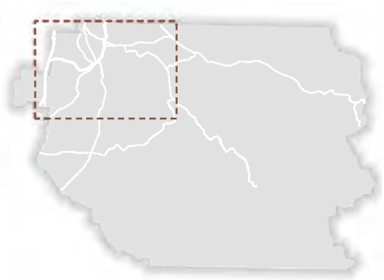
CLACKAMAS COUNTY
TRANSIT DEVELOPMENT PLAN



Long-Term Recommendations: Routes

- 8 or Fewer Runs per Day
- 9 - 16 Runs per Day
- 17 - 32 Runs per Day
- 33 - 64 Runs per Day
- 65 or More Runs per Day

LongTermTrips

- 9 - 16 Runs per Day
- 17 - 32 Runs per Day

Planned Services

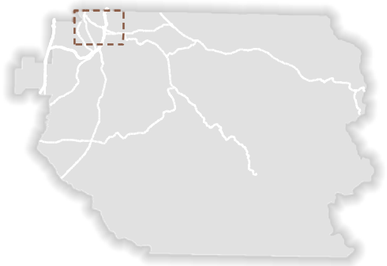
- Wilsonville to Clackamas Town Center
- Tualatin Shuttle (New)
- Mobility Hub
- Transit Centers
- Park and ride lots
- Urban Growth Boundaries
- County Boundary

0 3 Miles

Long-Term Recommendations
Clackamas County Transit Development Plan

Figure
23

CLACKAMAS COUNTY
TRANSIT DEVELOPMENT PLAN



Long-Term Recommendations: Routes

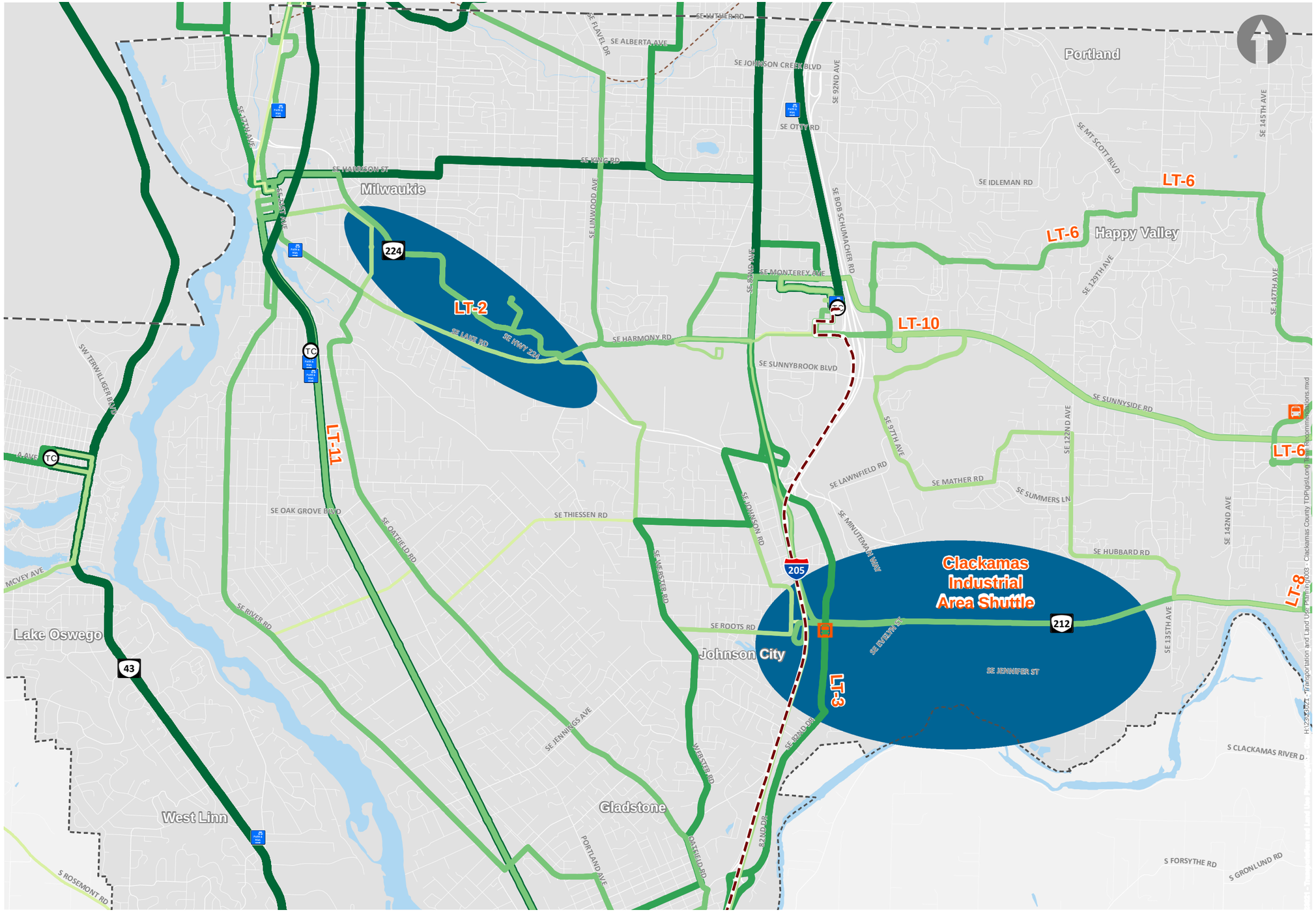
- 8 or Fewer Runs per Day
- 9 - 16 Runs per Day
- 17 - 32 Runs per Day
- 33 - 64 Runs per Day
- 65 or More Runs per Day

LongTermTrips

- 9 - 16 Runs per Day
- 17 - 32 Runs per Day

Planned Services

- Wilsonville to Clackamas Town Center
- Tualatin Shuttle (New)
- Mobility Hub
- Transit Centers
- Park and ride lots
- Urban Growth Boundaries
- County Boundary



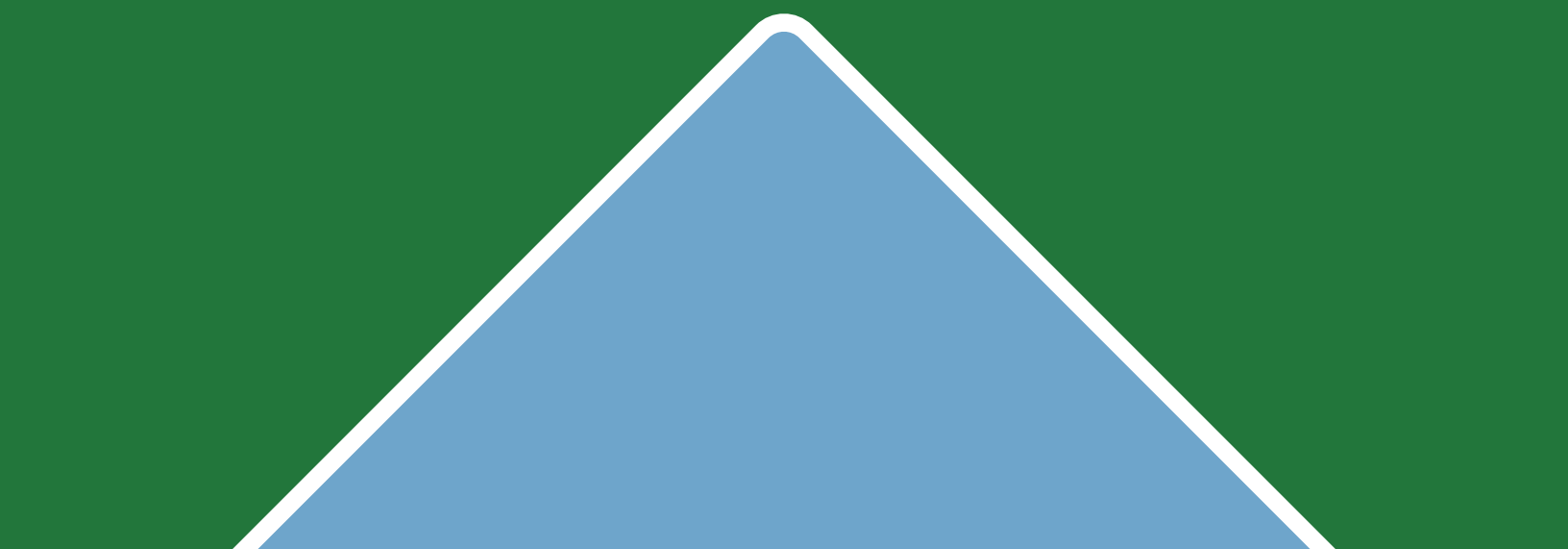
0 1 Miles

Long-Term Recommendations
Clackamas County Transit Development Plan

Figure
24

INFRASTRUCTURE PLAN

- TRANSIT CENTERS AND STOP IMPROVEMENTS
- BICYCLE AND PEDESTRIAN FACILITIES
- INFORMATION AND TECHNOLOGY



Infrastructure Plan

The following section summarizes the infrastructure investments that interface with transit service in Clackamas County, as well as information and technology that is available across the county's multiple transit providers. Additional information can be found in *Reference G: Future Solutions Strategies Memorandum.*

Transit Centers and Stop Improvements

Safe and comfortable passenger facilities can improve the riding experience and increase ridership by improving stop visibility, providing protection from poor weather, and improving access to transit. The following sections describe potential implications of and high-level cost estimates for facility improvements.

Transit Centers and Major Transit Stops

Transit centers provide a transfer point for bus routes and other transit services, while major transit stops are typically provided at major activity centers. In addition to providing greater passenger amenities that improve rider comfort, transit centers and major transit stops provide visibility for the transit service, reminding residents and visitors of the availability of the service within their community. The following key concepts should be considered when constructing transit centers or major transit stops:

- The location should consider pedestrian and bicycle access to nearby destinations, ease of access by bus that reduces out-of-direction travel and allows for safe bus operations, and highly visible.
- Size the stop or transit center to accommodate planned 20-year growth, both in terms of the number of buses accommodated and the size of rider amenities.
- Materials used should consider life-cycle costing, which usually points toward high quality, long-lasting materials that have lower on-going maintenance costs.
- The design should maintain sight lines into and across the station and provide adequate lighting.
- Consider public art for transit centers. Art has been shown to discourage vandalism and can also be used to involve the local arts community in the transit center project.
- Consider amenities such as enhanced shelters, drinking water, and restrooms.
- Locate information displays at transit centers and at some major stops to provide system-wide data, real-time information, transfer times between routes, and general schedule and overall system information.
- Incorporate tree planting and vegetation into site design to reduce localized urban heat island effects. Select and plan trees to withstand rain and wind events. Shade parking lots, building walls, and air conditioner condenser units.
- Incorporate pervious pavement and light color paving materials into parking lots and other surfaces to support storm water management and reflect sunlight to promote cooling.
- Design indoor spaces to intentionally protect against outdoor pollutants (whether from climate change impacts or vehicular exhaust pollutants) with high quality ventilation and filtration systems.

Current bus stops that have more than ten passenger boardings a day should be considered major stops, and merit consideration for a higher level of improvement (relative to the base level amenities found at all bus stops), such as a shelter or information case.

Bus Stops

Waiting at a bus stop is generally a rider's first direct interaction with the transit system on a given trip; therefore, providing comfortable and safe stops enhance the transit system. The cost for a new bus stop sign and pole, installed, can range from $300 to $1,000, depending on the material and the installation conditions. Designated bus stops have the following advantages:

- They provide awareness of the service, improving the visibility of transit in the community.
- They can be located to assure safe bus and passenger access.
- They can be improved with a paved landing pad, for example, to facilitate access by riders needing to use the bus lift or ramp.
- They can consolidate access, reducing the number of stops a bus makes along its route and thereby speeding up the overall trip.
- They can help communicate service information such as route numbers.
- Tactical tree planting and siting can provide shade and protection from extreme weather at bus stops.

Bus stops should be located to allow for safe bus and passenger access.

- Where possible, bus stops would be located near existing or planned sidewalks or other pedestrian connections that allow for safe pedestrian crossing of the street.
- On major roadways bus stops should allow for the bus to stop out of the traffic lane to avoid rear end collisions and discourage unsafe passing of the bus by motorists.
- Major bus stops should have lighting and accommodations for bicycle parking such as racks.

Shelters

Passenger shelters add to the comfort of waiting for a bus and are generally very popular with riders, especially in terms of access and usability for people with disabilities. An "off the shelf" passenger shelter typically costs approximately $6,000 plus installation. Passenger shelters will incur maintenance costs, both for routine cleaning and repair and replacement as needed. Passenger shelters must be designed to meet the requirements of the Americans with Disabilities Act (ADA) and should be located so as to provide safe and convenient pedestrian and bicycle connections with nearby destinations. In addition to the overhead protection (roof), shelter amenities can include:

- Windscreens
- Benches
- Trash receptacles
- Passenger information

Passenger shelters are recommended at high-use stops and all transit centers. All major stops should have shelters; all transit centers currently do have shelters, but shelters also should be installed at major stops moving forward. The condition of existing shelters at these locations should be reviewed and additional amenities considered, although final prioritization depends on the future service plan.

Figure 25. Simmi Seat
© 2015 Simme LLC

Benches

An alternative to a shelter for a stop that has less ridership is a bench. Benches should be considered for stops with at least three boardings per day, although other factors, such as the proximity to senior housing, should be factored into the decision as well. Benches that attach to the bus stop pole (see Figure 25) take up very little space, have low maintenance, and are relatively inexpensive. Installed benches vary in price from $500 to $1,500.

Bicycle and Pedestrian Facilities

This section identifies bicycle and pedestrian infrastructure gaps relative to accessing transit and jobs, primarily considering existing and proposed transit centers and park-and-ride facilities. Virtually every bus rider is also a pedestrian, and bicycles provide an important first/last-mile option for transit. Improvements such as continuous sidewalks on both sides of the street, low-stress bicycle facilities, street lighting, and enhanced pedestrian and bicycle crossings at reasonable intervals can improve transit ridership by facilitating walking and biking access.

The following review of bicycle and pedestrian facilities is based on high-level model data, which may not be complete or entirely up-to-date. As such, this review highlights areas of focus, but relies on county and local jurisdiction transportation system plans (TSPs) to identify specific facility improvements near transit lines. At a high level, the following transit corridors are generally lacking in bicycle and pedestrian facilities:

- Rural highways, such as Highways 99E (Canby – Oregon City), 211, 212, 213, 224, and US 26
- Urban highways, such as Highways 43 and 99E (within the Metro service area)
- Streets in areas with planned future service, such as
  - Borland Road near Tualatin
  - Jennings Avenue, Thiessen Road, and Hill Road in Jennings Lodge/Oak Grove
  - Streets in North Happy Valley, Damascus, and Boring
  - Streets along the C2C Corridor

The following sections highlight connectivity near transit centers and mobility hubs.

Bicycle Facilities

Figure 26 shows bicycle facilities within the Clackamas County portion of the Metro service area, including whether those facilities are off-street paths, on-street facilities, or shared roadways, and the location of transit centers and park-and-rides. Some transit centers – such as Clackamas Town Center and the SE Park Avenue MAX Station – have bicycle connections in all directions, while others – such as the Milwaukie and Estacada park-and-rides – have few if any connections. Providing low-stress bicycle facilities to these key transit stops, as well as bike lockers or other secure bicycle storage, can enhance transit ridership and make first/last-mile connections.

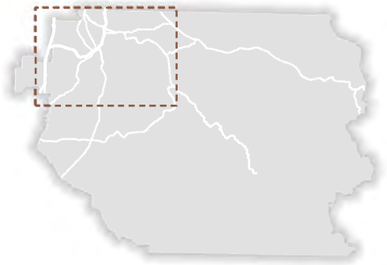
Pedestrian Facilities

Figure 27 shows sidewalk availability within the Clackamas County portion of the Metro service area, including whether sidewalks are on both sides or one side of the street. The figure also shows the location of transit centers and park-and-rides.

As shown, transit centers in downtown cores such as Oregon City and Lake Oswego generally have good sidewalk connectivity. However, several park-and-rides, such as SE Fuller Road and West Linn, lack connections. While park-and-rides primarily serve vehicular access, their associated stops tend to have higher ridership and therefore a higher level of transit amenities. Therefore, providing bicycle and pedestrian connections to these facilities can improve the rider experience.

Providing access to transit facilities is of particular importance as well as being a legal requirement. Transit centers, shelters, and new or relocated bus stops should be designed to meet the requirements of the ADA. It is recommended that cities, the County, and ODOT prioritize street corners near transit centers and shelters for ADA ramps.

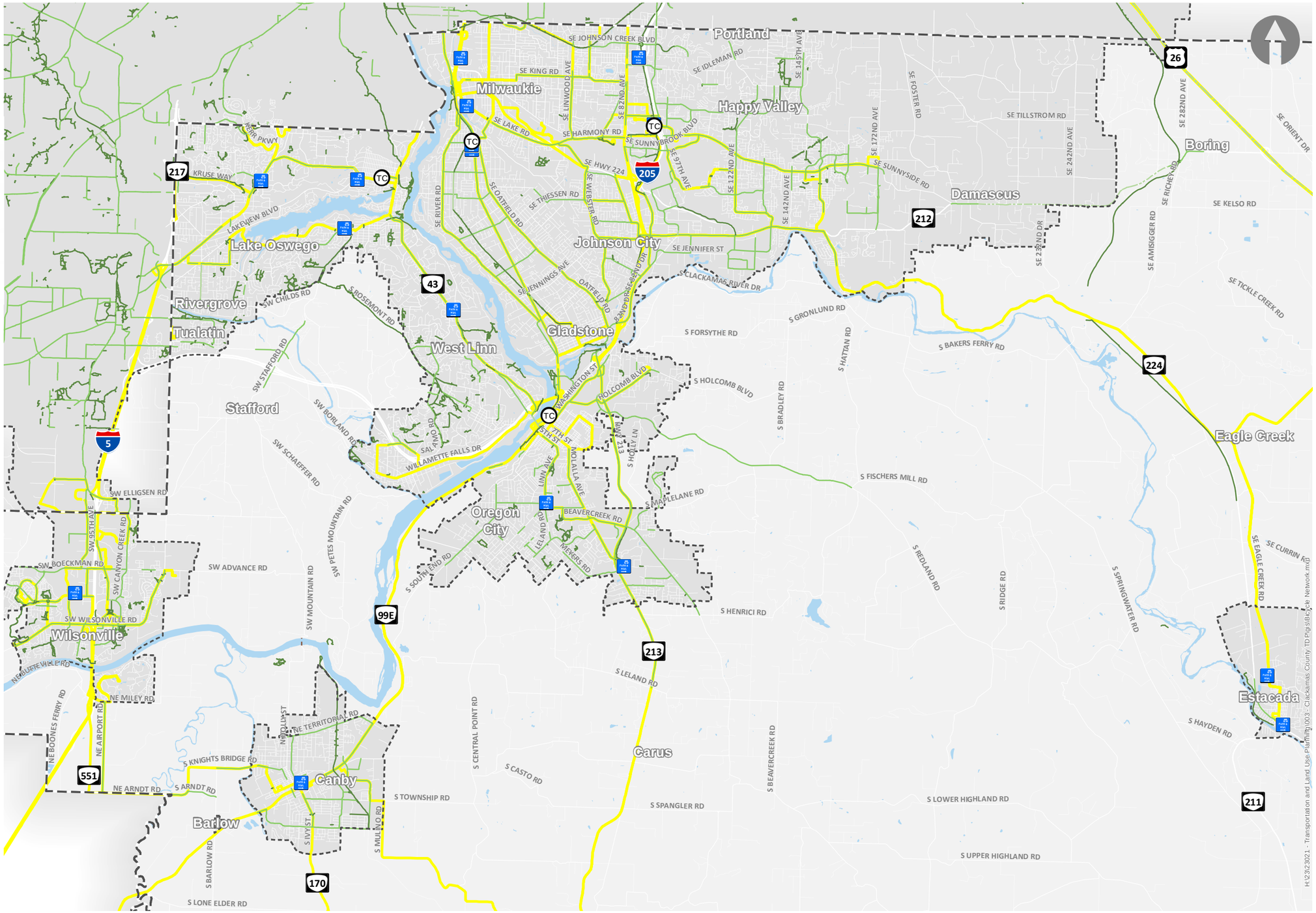
CLACKAMAS COUNTY
TRANSIT DEVELOPMENT PLAN



- TriMet Transit Centers
- Park and ride lots
- Transit Routes
- Urban Growth Boundaries
- County Boundary

Bicycle Facility

- Shared Facility
- On-Street Bicycle Facility
- Off-Street Bicycle Facility



0 3 Miles

Bicycle Network
Clackamas County Transit Development Plan

Figure
26

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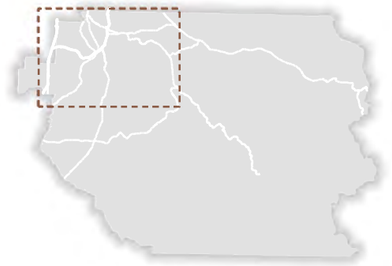
CLACKAMAS COUNTY
TRANSIT DEVELOPMENT PLAN



- TriMet Transit Centers
- Park and ride lots
- Transit Routes
- Urban Growth Boundaries
- County Boundary

Sidewalk Data

- Both Sides
- One Side
- None

0 3 Miles

Pedestrian Network
Clackamas County Transit Development Plan

Figure
27

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Information and Technology

Information and technology services can improve the ridership experience and increase ridership by improving ease of transit use by providing information. The following sections describe potential implications of and high-level cost estimates for information and technology improvements, including real-time vehicle arrival information, fare payment options, and online/mobile trip planning tools.

Online/Mobile Trip Planning Tool

Trip planning tools can help the public get travel information at any day or time. While some providers create proprietary trip planning tools, free and readily available trip planning tools are available and more fitting to a small transit provider's size and needs. These tools include Google Maps, OneBusAway, Moovit, and Transit. All of these tools depend on the open data format for GTFS-Realtime.

Real-Time Vehicle Arrival Information

Several Clackamas County transit providers post schedules for all routes, but do not provide real-time vehicle arrival information. Real-time information helps improve the ridership experience by reducing passenger wait times (passengers can choose to show up shortly before the bus arrives), providing passengers with confidence that they haven't missed a bus that is running late, and generally creating a more informed and comfortable rider. This information can be made accessible via websites, smartphones, and "push" technologies such as text messages. The County could conduct a feasibility study on technology options that the various transit providers can use with the goal of integrating arrival information in one location for the transit user, similar to the County's ongoing fare study.

Fare Payment Options

Fare payment options include smart card-based electronic fare collection systems, mobile ticketing, and more. Offering additional fare payment options may increase ridership and improve the customer experience. In addition, transitioning to mobile systems reduces the effort of collecting and processing paper tickets and cash fares. Implementation costs vary; large systems range from $35,000 to $50,000 per vehicle to upgrade, while smaller systems have been implemented for as little as $21,000 per vehicle.[2]

Fleet Considerations

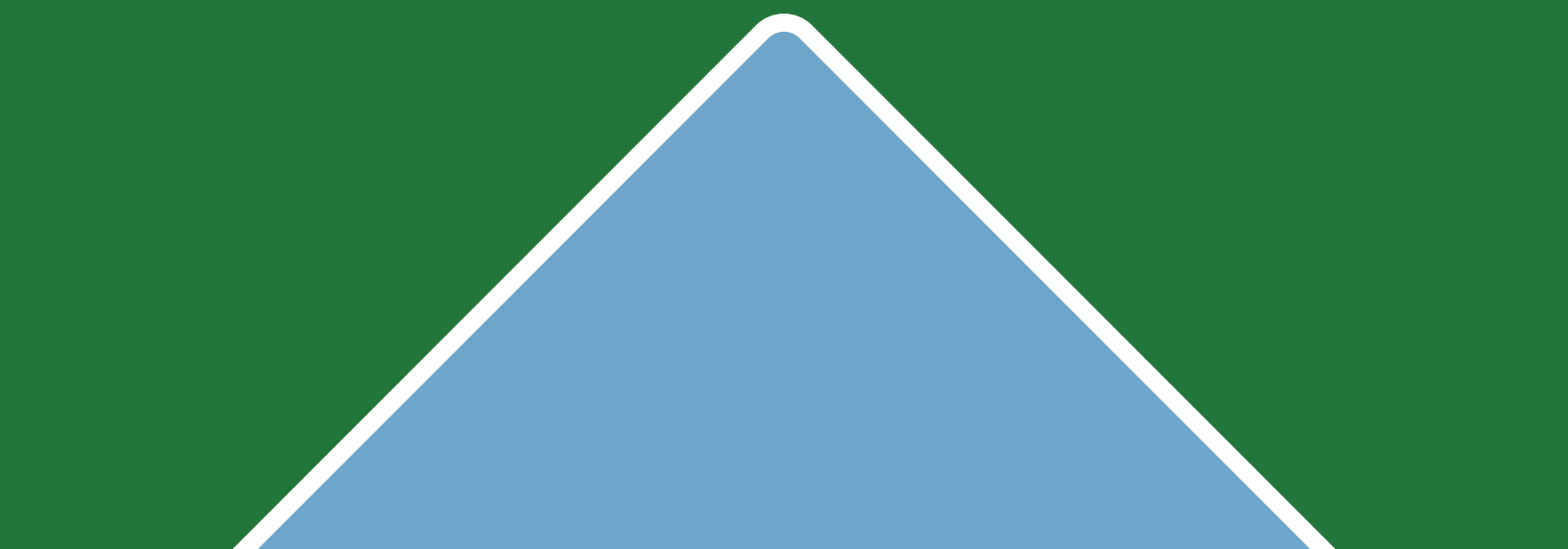
Several transit providers in Clackamas County have or are transitioning to low- or no-emissions vehicles. However, several providers use higher emission fuel vehicles. Clackamas County's fleet for the Mt. Hood Express operates on diesel.

- A bus with hybrid-electric propulsion costs $150,000 to $200,000 more than a similar bus with diesel propulsion but will generally reduce fuel costs by approximately 25 to 30 percent.
- A bus with compressed natural gas (CNG) costs $25,000 to $50,000 more than a similar bus with diesel propulsion but will generally reduce fuel costs by approximately 25 to 45 percent.
- Challenges in using hybrid-electric and CNG is the additional cost of purchasing new vehicles (typically more than comparable diesel models) and need for charging/dual fueling facilities.

Clackamas County could look for opportunities to transition to no or low-emission vehicles over time, partnering with neighboring transit agencies that have completed or begun their transition.

[2] https://www.itsknowledgeresources.its.dot.gov/ITS/benecost.nsf/ID/3960B2C6B48F4EE785257F0F004DDAE0?OpenDocument&Query=CApp

LAND USE STRATEGIES AND DEVELOPMENT



Land Use Strategies and Development

This section identifies potential transit-supportive land use implementation strategies for jurisdictions in Clackamas County. Additional information can be found in *Reference G: Future Solutions Strategies Memorandum.*

The preliminary transit-supportive strategies recommended in this memorandum build on land use strategies identified in previous planning documents, providing what can be regarded as "best practices". Land uses, development density, transportation system connectivity and access, parking requirements, and urban form (e.g., building setbacks) are all regulatory elements and code strategies related to development that impact how supportive an area is for transit service. The resulting set of transit-supportive code strategies is presented in Table 15.

- Coordination – Coordination between jurisdictions and transit service providers regarding proposed development is critical to ensuring transit-supportive development occurs. The periods during which an applicant is preparing a development application and when that application is under review by the jurisdiction present key opportunities for this coordination.
- Uses – The general idea behind use-related transit-supportive strategies is: (a) to encourage uses that support a high number and density of potential transit riders; and (b) to discourage uses that do not provide many riders or that do not promote a pedestrian-oriented environment that supports safe, convenient, and attractive transit access. Therefore, use regulations proposed in Table 15 promote a variety of uses and high trip generation as well as limit auto-oriented uses that detract from a pedestrian-oriented environment.
- Development Standards – Development standards address the intensity and form that development takes. Like use regulations, development standards can be used to promote higher densities of riders near transit, establish a pedestrian-friendly environment, and support transit. Particular transit-supportive development standards that are recommended in Table 15 include those that: require minimum levels of residential and employment density; bring buildings closer to transit streets and connect them to transit stops; and create visual interest and pedestrian amenities along transit street-facing building fronts.
- Access – Providing safe and convenient access to transit is critical to its robust use. In addition to requiring access directly from buildings on a site to an existing or planned transit stop, transit-supportive access ensures that transportation network connectivity is high enough to easily reach transit stops by walking and rolling (e.g., biking, scooting, mobility devices). Strategies proposed in Table 15 promote this connectivity through maximum block length standards and required non-motorized access through long blocks.[3]
- Parking – Parking affects the transit orientation of development in several ways. Capping the amount of vehicle parking permitted can help make alternatives to driving more attractive. Providing sufficient and well-designed bicycle parking supports bike connections from transit to destinations. The location and design of parking lots – e.g., restricting parking between buildings and the street and requiring landscaping and walkways – play a significant role in making pedestrian access to transit attractive and convenient. Parking areas also provide potential locations for transit stops, park-and-rides, and ridesharing.

[3] Projects that improve pedestrian and bicycling infrastructure and connections to transit streets are also vital to supporting transit. These types of projects fall within the purview of transportation system planning. Jurisdictions within Clackamas County vary as to how recently their transportation system plans have been updated and when they next expect to conduct an update.

Table 15. Transit-Supportive Land Use Strategies

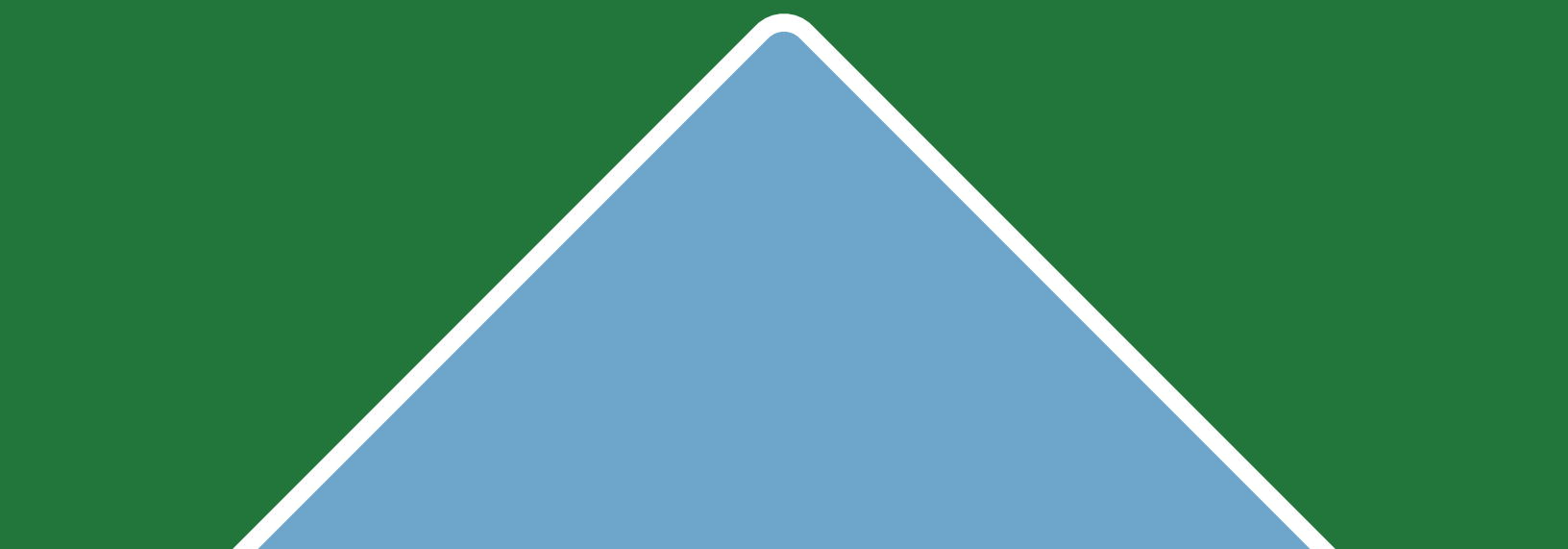
Transit-Supportive Code Strategy	Notes
Coordination	
Coordination with Transit Provider	Require involvement of transit provider in pre-application conference and/or application review for development applications. Require notice of development application hearings be sent to transit provider
Transit Stop Improvements/Amenities	Work with transit provider to provide seating, lighting, etc. consistent with their development and master plans
Uses	
Accessory Dwelling Units	Allow a minimum of one accessory dwelling unit (ADU)
Mixed Use	Allow or require mixed uses
Major Trip Generator	Allow uses that offer goods or services that attract large numbers of employees or members of the public, such as: • Institutional Uses for the Public • Neighborhood Commercial Uses • Major Employment Generating Uses • Major User-Generating Uses
Non-Transit-Supportive: Auto-Oriented and Auto-Dependent Uses	Prohibit or restrict auto-oriented and auto-dependent uses, including uses that provide goods and services for vehicles and uses (e.g., distribution facilities) where vehicles are a primary and integral part of operations
Non-Transit-Supportive: Drive-Throughs	Restrict or prohibit drive-throughs
Development Standards	
Residential Density	Establish minimum density consistent with local transit service guidelines identified in this memo
Minimum Floor Area Ration (FAR) or Lot Coverage	Establish, e.g., a FAR of 1:1 to 2:1 or no maximum lot coverage
Max. Front Yard Setbacks	Establish, e.g., no minimum setback and maximum 10-foot setback
Pedestrian Amenities in Front Setback	Allow for greater front setback when pedestrian and bicycle space (seating, parking, wider sidewalks, enhanced bicycle facilities, etc.) provided, e.g., up to 20 feet of setback for up to 50% of building face
Pedestrian Orientation (Basic)	Require primary entrance oriented to street and pedestrian connection from building(s) to street (transit stop) Encourage pedestrian amenities (in front setback)
Pedestrian Orientation (Enhanced)	Require building articulation, minimum ground floor windows, and weather protection (e.g., awnings), e.g., windows for minimum 50% of length and minimum 60% of area of street-facing wall; weather protection for minimum 50% of length of street-facing wall and over street-facing entries Require integration of two or more other pedestrian-oriented design features including human-scale building lighting, wayfinding elements, signs, and horizontal/vertical elements (e.g., cornice, columns, transoms)
Additional Height for Housing	Allow for additional building height (up to an alternative maximum) when housing provided, possibly with design requirements such as stepbacks

Transit-Supportive Code Strategy	Notes
Access	
Block Length	Establish maximum block length standards consistent with State of Oregon Transportation & Growth Management Model Development Code for Small Cities, 3rd Edition ("Model Code")[4]
Accessways Through Long Blocks	Require non-motorized accessways consistent with the Oregon Transportation Planning Rule
Parking	
No Vehicle Parking/ Circulation in Front Setback	Prohibit parking and circulation in front setback Related to maximum front setback
Parking Maximums	Potential reduction of existing maximums
Parking Reductions for Transit	Establish reductions (including maximum % reduction) for locations within specified distance of transit
Parking Management Strategy	Consider developing a Parking Management Strategy to evaluate parking needs and manage supply (for integration into future code requirements and/or policy adopted related to the Clackamas County Transit Development Plan)
Landscaping and Walkways in Parking Lots	Set minimum standards for perimeter landscaping, landscaping islands, and walkways through parking lots
Transit-Related Uses in Parking Lots	Allow for redevelopment of existing parking lots to accommodate transit-related uses (e.g., stops, park-and-rides, transit-oriented buildings), provided that other minimum parking standards can be met and the location of the use is appropriate and safe
Preferential Parking for Ridesharing	Require location of rideshare (carpool) parking required to be closest to primary entrance, aside from Americans with Disabilities Act (ADA)-accessible parking
Bicycle Parking	Establish minimum bicycle parking space and design requirements consistent with the Oregon Transportation Planning Rule

[4] https://www.oregon.gov/LCD/TGM/Pages/Model-Code.aspx

FUNDING AND IMPLEMENTATION OPTIONS

- FUNDING OPTIONS
- IMPLEMENTATION STEPS



Funding and Implementation Options

Funding Options

There are several federal, state, and local funding sources that can be tapped for funding transit service improvements in Clackamas County.

Major funding sources for transit operations and improvements include a range of Federal Transit Authority (FTA) formula grants, such as the urbanized area, rural provider, and elderly and disabled grant programs, as well as discretionary grants for capital improvements, planning, fueling alternatives, and more.

The Statewide Transportation Improvement Fund (STIF) source generated from HB 2017 provides new and additional funding for transit across Oregon. In particular, this funding source allows out-of-district transit routes - crucial to Clackamas County's ability to connect across the different transit districts. Oregon's Special Transportation Fund (STF) also remains a key source of funding at the state level.

Lastly, several transit providers in Clackamas County receive revenues from payroll taxes within their service districts, separate from STIF funds. Other local revenues can include fare revenues, advertising, and contracted service programs.

Table 16 provides an overview of potential funding sources, whether Clackamas County would be a direct applicant to ODOT, FTA, etc. or a sub-recipient such as TriMet's pass-through FTA funds, and what jurisdictions are eligible to receive those funds. Table 17 indicates whether a specific funding source would apply for full funding or partial funding on each TDP project.

Table 16. Potential Funding Sources

ID	Funding Source	Description	Direct (D)/ or Subrecipient (S)	Eligibility			
				MPO	County	City	District
1	**Surface Transportation Block Grant (STBG)**	Federal flexible funding that may be used for projects to preserve and improve conditions on and performance of any federal-aid highway, bridge, or tunnel project on any public road; pedestrian and bicycle infrastructure; and transit capital projects, including intercity bus terminals. These funds are distributed through Metro's Regional Flexible Fund Allocation (RFFA), and projects are focused on four primary RTP investment priorities – Equity, Safety, Climate Smart Strategy, and Congestion.	S	•	•	•	
2	**State Highway Fund**	Revenue sources are: motor vehicle registration and title fees; driver license fees; motor vehicle fuel taxes; and weight-mile taxes. Fund expenditures are restricted to construction; improvement; maintenance; operation; and use of public highways, roads, streets, and roadside rest areas.	D		•	•	
3	**General Fund**	Property taxes from local agencies' permanent tax rate.	D		•	•	
4	**Statewide Transportation Improvement Fund (STIF)**	Established in the Keep Oregon Moving (HB 2017) transportation funding package, this source funds public transportation operations and capital investments using a formula to mass transit districts, transportation districts, and counties without either type of district. TriMet is the Qualified Entity responsible for allocating STIF formula funds (90% of the program total) to sub-recipients within the tri-county area, including Clackamas County. The County, as a public transportation provider, can directly apply for STIF discretionary grants (5% of the program total) and intercommunity grants (4% of the program total).	S	•	•		•
5	**State Special Transportation Funds (STF)**	Allocated by the Oregon Legislature every two years. Funds may be used for any purpose directly related to public transportation services for seniors and people with disabilities. Funds managed locally by STF agencies (transit districts, counties without transit districts, tribes) TriMet is the STF agency for the tri-county region; Clackamas County may be a sub-recipient of STF funds through TriMet. The Oregon Legislature has directed ODOT to develop concepts for merging the STIF and STF programs, which may be implemented in the FY21-23 biennium.	S	•	•	•	•
6	**Federal Transit Administration (FTA) Grants**	Section 5310 Funds: formula funding to states and metropolitan regions for the purpose of meeting the transportation needs of seniors and people with disabilities. ODOT allocates state 5310 funds to rural areas via local STF agency and may reserve for discretionary programs.	D		•	•	•
		Section 5339 Funds: funding through an allocation process to states for small urban and rural areas, and transit agencies in large urban areas, to replace, rehabilitate, and purchase buses and related equipment and to construct bus-related facilities.	D		•	•	•
		Section 5307: formula transit funds for large and small urban districts. TriMet is the designated recipient for the Oregon portion of the Portland metropolitan area.	S	•			•
		Section 5309: capital investment grants: fund major transit capital investments, including heavy rail, light rail, and bus rapid transit.	S	•			•
		Section 5303/4/5: Metropolitan and Statewide Planning. Funds are allocated to states, which then distribute them to regional and local agencies for transit planning.	D	•	•	•	•
7	**Connect Oregon Funds**	Projects are eligible for grants covering up to 70% of project costs. A minimum 30% cash match is required from the recipient for all grant-funded projects. Projects eligible for funding from state fuel tax revenues are not eligible for Connect Oregon funding. In transit, funding is typically restricted to transit facilities, but not operating costs.	D	•	•	•	
8	**Private/Public Sponsorships**	Private/public sponsorships involve a private entity, such as a local business owner, working with the public agency to fund a project (e.g., bus stop shelter and sidewalk connection maintenance). In return for their investment in the community, these business owners often have recognition for their role, providing a marketing venue for the business.	D	•	•	•	•
9	**Congestion Mitigation & Air Quality (CMAQ)**	Federal flexible funding source to state and local governments for transportation projects and programs to help meet the requirements of the Clean Air Act. These funds are distributed through Metro's Regional Flexible Fund Allocation (RFFA), and projects are focused on four primary RTP investment priorities – Equity, Safety, Climate Smart Strategy, and Congestion.	S	•	•	•	•
10	**STIP Enhance**	Funds allocated to projects through a competitive grant application process. Eligible projects include public transit capital improvements.	D		•	•	•
11	**Property Taxes**	Tax assessed on the value of an owned property, a portion of which can be used to fund transit.	D	•	•	•	
12	**Payroll Taxes**	Taxes imposed on employers or employees, usually calculated as a percentage of the salaries that employers pay their staff, and generated through deductions from an employee's wages or taxes paid by the employer based on the employee's wages.	D		•	•	•
13	**Business Taxes**	Tax assessed on the net income of businesses near transit facilities/routes.	D		•	•	
14	**Tax Increment Financing**	Used to capture additional property taxes generated in the vicinity of transit-specific improvements or areas. This type of funding can also be used to capture a portion of property value increase caused by a particular investment.	D		•	•	
15	**Tax Incentive Zones**	Designated areas that provide an indirect avenue for transit funding by potentially increasing fare revenue, sponsorship revenue, etc. by providing tax incentives for businesses and residents near transit-oriented or transit-friendly developments.	D		•	•	
16	**Multimodal Impact Fees**	Similar to transportation system development charges (SDC), but focused on improvements to multimodal transportation options. In the event a TIF is established, the fixed-route service could work to allocate a portion of funds towards transit-enhancing improvements.	D		•	•	
17	**ODOT Safe Routes to School Grant Program**	Eligible projects include safety improvements that positively affect the ability of children to walk and bicycle to school. Projects must be within a public road right-of-way, consistent with jurisdictional plans, supported by the school or school district, within a one-mile radius of a school, and able to be constructed within five years of the application. Project examples include sidewalks, median refuge islands, rapid flashing beacons, etc. The minimum funding request is $60,000, and the maximum is $2 million.	D		•	•	•
18	**Metro Grant Programs**	Metro provides grant opportunities for various transportation-based projects. One such opportunity is the Regional Travel Options (RTO) grant, which includes Infrastructure and Innovation grants to support light infrastructure that make it easier, more convenient, or safer for people to get around using travel options and Safe Routes to School grants.	S	•	•	•	•
19	**Federal Lands Access Program (FLAP)**	Improves transportation facilities that provide access to, are adjacent to, or are located within Federal lands. The Program supplements State and local resources for public roads, transit systems, and other transportation facilities, with an emphasis on high-use recreation sites and economic generators. Grant applications must be jointly submitted by the federal land agency (e.g., US Forest Service) and the agency with maintenance/operating responsibility. If the program is reauthorized by Congress, an application window for Oregon is expected to open in 2021.	S		•	•	•

Table 17. Project Funding Eligibility

Transit Project	Funding Source																		
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Clackamas Industrial Area			○	●	●	●		●	○		○	●	○	●	○	○			
Highway 43: Oregon City to Portland			○	●	●	●		○	○		○	●	○			○			
I-205: Oregon City to I-5 Interchange			○	●	●	●		○	○		○	●	○			○			
Oregon City (South and West)			○	●	●	●		○	○		○	●	○			○			
Milwaukie Industrial Area			○	●	●	●		●	○		○	●	○	●	○	○			
West Lake Oswego/ Kruse Way			○	●	●	●		○	○		○	●	○			○			
Wilsonville (West Wilsonville)			○	●	●	●		○	○		○	●	○			○			
Happy Valley			○	●	●	●		○	○		○	●	○			○			
Canby (North and South)			○	●	●	●		○			○	●	○			○			
Damascus			○	●	●	●		○			○	●	○			○			
I-205: Oregon City to Clackamas Town Center			○	●	●	●		○	○		○	●	○			○			
Jennings Lodge–Oak Grove–Oatfield			○	●	●	●		○	○		○	●	○			○			
Highway 99E: Oregon City to Canby			○	●	●	●		○			○	●	○			○			
Highway 212: I-205 to US 26			○	●	●	●		○			○	●	○			○			
Estacada–Redland–Oregon City			○	●	●	●		○	○		○	●	○			○			
Highway 99E: Oregon City to Portland			○	●	●	●		○	○		○	●	○			○			
Highway 211: Molalla to Woodburn			○	●	●	●		○			○	●	○			○			
C2C Corridor			○	●	●	●		○	○		○	●	○			○			
Highway 213: South of Molalla			○	●	●	●		○			○	●	○			○			
Boring			○	●	●	●		○			○	●	○			○			
East Tualatin			○	●	●	●		○	○		○	●	○			○			
US 26: West of Sandy			○	●	●	●		○			○	●	○			○			
Major Transit Centers	●	●	○	●	●	●	○	○	○	●	○	●	○	●	○	○	○	○	○
Park and Rides	●	●	○	●	●	●	○	○	○	●	○	●	○	●	○	○	○	○	○
Bus Stop Improvements	●	●	○	●	●	●	○	●	○	●	○	●	○	●	○	○	○	○	○
Real-Time Vehicle Arrival Information			○	●	●	●	○	○	○	●	○	●	○			○		●	
Trip Planning Tools			○	●	●	●	○	○	○	●	○	●	○			○		○	
Fare Payment Options			○	●	●	●	○	○	○	●	○	●	○			○		●	
Fleet Considerations			○	●	●	●	○	○	○	●	○	●	○			○			

● indicates an opportunity for full or significant funding

○ indicates an opportunity for partial or limited funding

Implementation Steps

In addition to implementing short-term, medium-term, and long-term transit services as outlined in Table 12, Table 13, and Table 14, respectively, there are services and planning work that must carry on to meet the county's growing transit needs. Table 18 identifies the actions and considerations to support implementation of short-term, medium-term, and long-term recommendations, beyond operating the services themselves.

ODOT requires a STIF plan to be submitted every two years. Public transportation service providers request STIF formula funds through their Qualified Entity (QE), in this case TriMet. This requirement provides an opportunity to make any updates to planned transit investments as demands shift in the future. The Clackamas County HB2017 Transit Advisory Committee helps coordinate STIF planning for all transit agencies in the county except for TriMet. This committee should be included in any ongoing STIF planning work to ensure that future county STIF plans are compatible with those of the county's transit agencies.

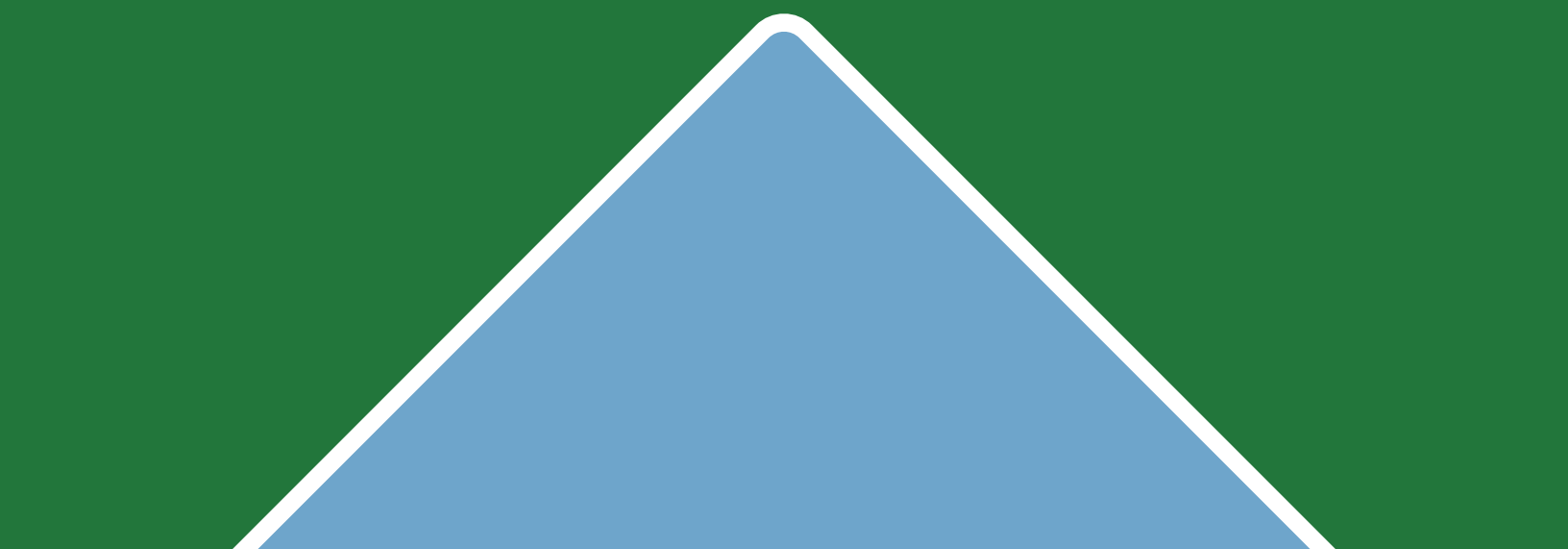
Table 18. Implementation Actions and Considerations

Recommendation	Action	Responsible Party
Throughout		
STIF Planning	Update STIF plan every 2 years for submission	Clackamas County
Transit Vehicles	Monitor transit vehicle needs for transit routes operated by Clackamas County	Clackamas County
General Transit Planning	Monitor potential increases to transit demand across the county	Clackamas County
General Transit Planning	Evaluate existing and short-, medium-, and long-term recommendation transit demand for potential increases	Clackamas County
Information and Technology	Promote real-time vehicle arrival information and other technologies for transit providers; Consider coordinated study, similar to the ongoing fare study	Clackamas County, CAT, CCC, SAM, SCTD, SMART
Short-Term		
Milwaukie Industrial Area	Coordinate Milwaukie Industrial Area Shuttle implementation with City of Milwaukie and TriMet Conduct additional outreach after COVID-19	Clackamas County, TriMet, Milwaukie
Oregon City Transit Center	Conduct further analysis of capacity	Clackamas County, TriMet, Oregon City
Clackamas Industrial Area	Coordinate a mobility hub within the Clackamas Industrial Area	Clackamas County, TriMet, ODOT
I-205: Oregon City to I-5 Interchange	Coordinate a mobility hub within West Linn's Willamette neighborhood	Clackamas County, TriMet, West Linn
Fare Options	Implement steps and findings from Clackamas County transit provider fare study	Clackamas County, CAT, SAM, SCTD, SMART

Recommendation	Action	Responsible Party
Medium-Term		
Highway 212: I-205 to US 26	Coordinate with SAM on the operator of this proposed transit route, TriMet for Clackamas Town Center Access	Clackamas County, SAM, TriMet
Estacada–Redland–Oregon City	Coordinate with county transit providers on transit route operator	Clackamas County, TriMet, CCC, Oregon City
Clackamas Town Center	Monitor capacity and storage availability at Clackamas Town Center	Clackamas County, CCC, TriMet
Happy Valley	Implement a mobility hub in Happy Valley	Clackamas County, TriMet
Boring	Implement a mobility hub in Boring	Clackamas County
Long-Term		
Estacada / Eagle Creek	Implement a mobility hub in Eagle Creek	Clackamas County, TriMet

MONITORING PROGRAM

- ANNUAL REVIEW OF PERFORMANCE MEASURES
- BIENNIAL REVIEW OF PERFORMANCE MEASURES
- OTHER PLANNING EFFORTS



Monitoring Program

The following section provides a program to track performance and the success of the recommendations. The program is data-driven and is founded on performance measures that can be tracked on a regular basis through set benchmarks. This program enables a dynamic system where service adjustments can be implemented and justified following performance evaluations.

Performance measures are divided into monitoring on an annual and biennial basis. Most performance measures should be reviewed each year; the performance measures set for biennial review are not as likely to fluctuate on an annual basis. As these performance measures are reviewed, the county may adjust how often specific performance measures need to be examined.

Annual Review of Performance Measures

The following performance measures should be, ideally, tracked annually to understand how the county's transit network is changing. With seven different transit providers, Clackamas County is uniquely positioned to see how the entire network operates and inform specific providers as needed if there are gaps, issues, or other concerns that are raised from these performance measures. Several of these measures are minor mapping updates and others are metric changes that could be quickly summarized by each provider (ex. Route Z added 3 hours of service per day, Provider Y added mobile payments), and thus are not expected to be a substantial effort for the County.

Intercommunity Connections (Connectivity Goal)

- New or enhanced intercommunity connections: A qualitative measure reviewing mapped transit routes and their frequency, community population sizes, and census data regarding underrepresented communities to identify needs and gaps. Focuses on routes between communities.

Communities with Transit Access (Connectivity Goal)

- The number of communities with access to transit: A qualitative measure reviewing mapped transit routes and their frequency, community population sizes, and census data regarding underrepresented communities to identify needs and gaps. Evaluates both intercommunity routes and local service, as well as connections to regional resources such as medical facilities and social services.

Service on Regional Corridors (Sustainability Goal)

- The number of directional runs per day per transit corridor: Measures service on transit corridors across the county. Different thresholds should be set for urban and rural environments.

Service Span & Frequency (Customer Experience and Mobility Goal)

- Service span per route: Examines the overall time that a route is in operation on a daily basis, with emphasis on where early morning and/or later evening service hours are offered. Weekday and weekend service span should be separated if weekend service is offered on a route. Compares the service span provided, including early morning/later evening service hours and weekend service. Tracks percentage of routes operating on Saturdays and Sundays and number of runs per day (span/frequency proxy). Table 19 shows the service frequency and service span for all transit routes in Clackamas County.

Table 19. Service Frequency and Hours of Service LOS for Transit in Clackamas County

Level of Service	Service Frequency (Headway)	Hours of Service (Service Span)
A	0 Routes (0%)	12 Routes (26%)
B	1 Route (2%)	9 Routes (20%)
C	10 Routes (22%)	14 Routes (30%)
D	18 Routes (39%)	4 Routes (9%)
E	11 Routes (24%)	6 Routes (13%)
F	6 Routes (13%)	1 Route (2%)

System Ease of Use (Customer Experience and Mobility Goal)

- Improvements made to travel between communities or transit providers: A qualitative measure that tracks improvements such as fare integration, technology improvements, and timed transfers.

Biennial Review of Performance Measures

The following performance measures are either less likely to change in a significant way on an annual basis and do not need to be tracked each year, or measures that are time-intensive to evaluate on an annual basis.

Service to Underrepresented Populations (Equity, Health, and Safety Goal)

- The percentage of underrepresented populations living within ¼ mile of a transit stop: Examines underrepresented populations, including low-income households, communities of color, and people with disabilities (among others) using the TNExT tool. This metric could include evaluating the service available at different levels of frequency, similar to the percent of general population served at different levels of service (see Table 21 and Figure 28).

Access to Jobs (Equity, Health, and Safety Goal)

- The percentage and/or number of jobs located within ¼ mile of a transit stop: In particular, focus on low-wage employment locations relative to transit using the TNExT tool.

Service Hours Per Capita (Customer Experience and Mobility Goal)

- Service hours per capita within ¼ mile of a transit stop: This metric can be used to show service hours across the county's transit network, which could highlight gaps in the existing transit network and can be evaluated using the TNExT tool. Table 20 shows the service per capita across the three counties that comprise the Portland metropolitan area.

Table 20. Service Hours per Capita

County	2017 Population	Population Density (per Square Mile)	Population Density of Area served by Transit (per Square Mile)	Service Hours	Service Hours per Capita
Clackamas	412,672	213.8	3,285.1	41,411	0.10
Washington	588,957	789.9	4,558.4	57,391	0.10
Multnomah	807,555	1,828.9	5,526.5	236,333	0.29

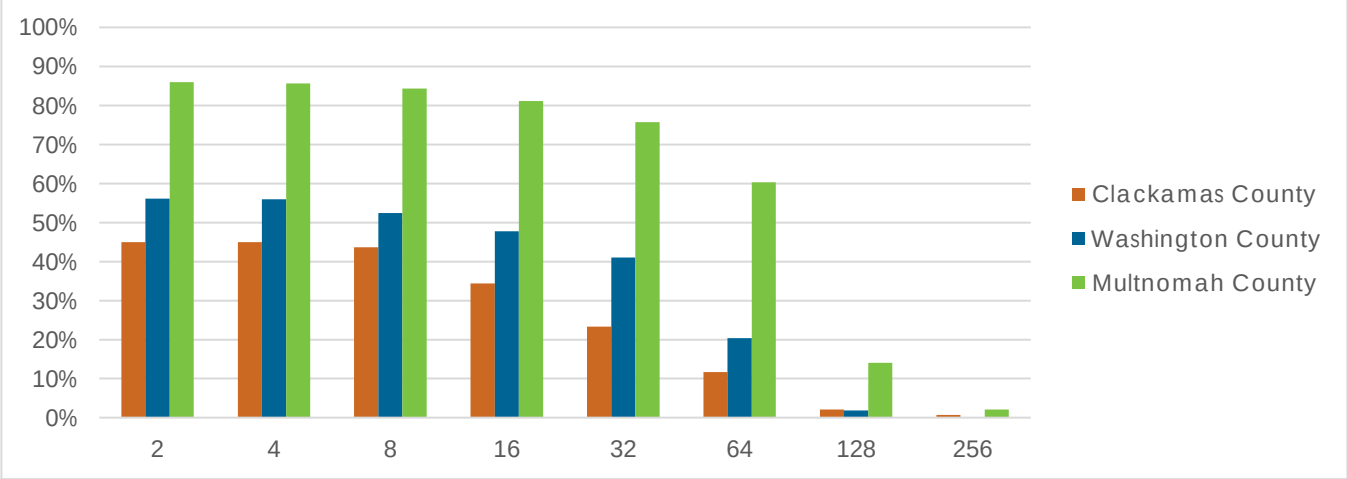
Population Served (Customer Experience and Mobility Goal)

- The percentage of people within ¼ mile of a transit stop at different levels of service: Examines the percentage of the general county population living within ¼ mile of a transit stop for lines with 15 minute headways or better, 30 minute headways or better, and greater than 30 minute headways. Examine areas inside and outside the Metro urban growth boundary separately, and the headway thresholds for these two areas may be different to reflect the different service goals between urban and rural transit providers. Table 21 and Figure 28 show the percentage of county population that lives within a quarter-mile radius of a transit stop based on the number of times a stop is visited per day.

Table 21. Resident Access to Transit Stops (0.25-mile radius) by Level of Service

County	Visits per Day - Resident							
	2	4	8	16	32	64	128	256
Clackamas County	45%	45%	44%	34%	23%	12%	2%	1%
Washington County	56%	56%	52%	48%	41%	20%	2%	0%
Multnomah County	86%	86%	84%	81%	76%	60%	14%	2%

Figure 28. Resident Access to Transit Stops (0.25-mile radius) by Level of Service



Walking and Bicycling Access (Equity, Health, and Safety Goal)

- The percentage of transit stops with walking or bicycling access: This is defined as having a sidewalk/path or bicycle lane/path connecting to the stop. Transit route, transit stop, sidewalk, and bicycle infrastructure shapefile data would be needed to analyze connections in GIS. Areas inside and outside the Metro urban growth boundary should be examined separately.

Low- or No-Emission Fleet (Sustainability Goal)

- Percent of fleet that uses low- or no-emission vehicles: Encourage all transit providers to move toward low- or no-emission transit vehicles and should track this data across all transit providers.

Capital Costs (Sustainability Goal)

- Capital costs for new or enhanced service: Examine county capital costs as well as transit agency capital costs for agencies in the county or for money spent on service in Clackamas County.

Annual Operating Costs (Sustainability Goal)

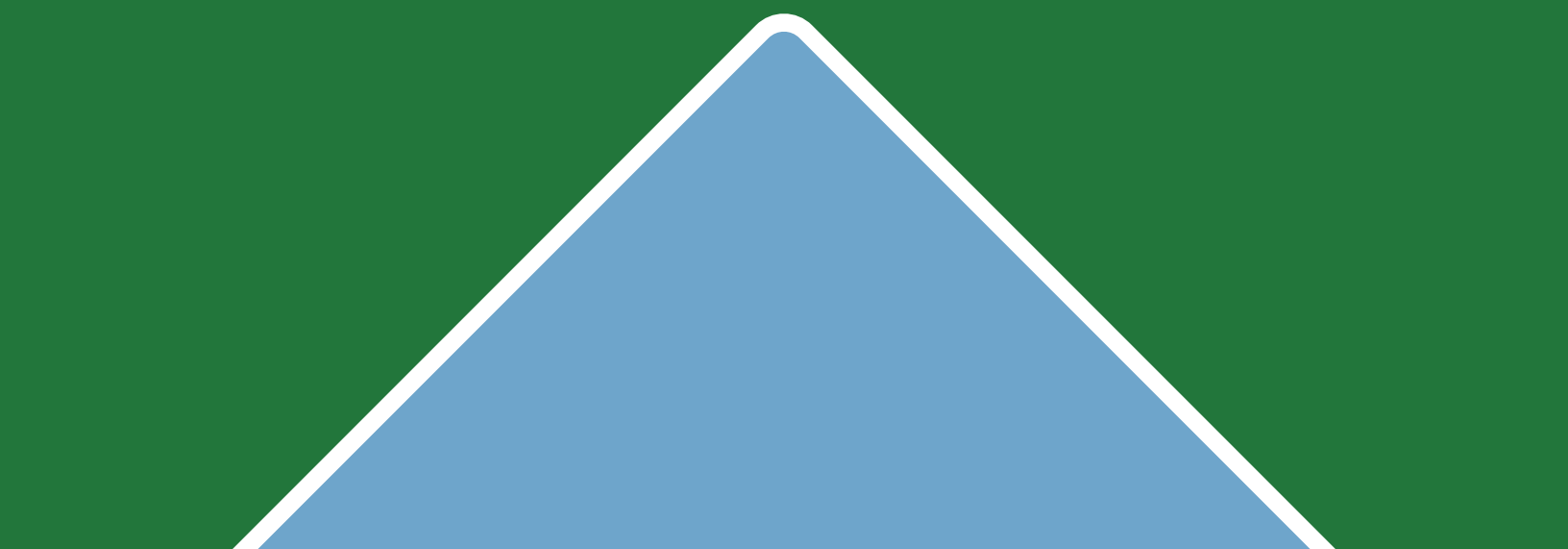
- Annual operating costs for new or enhanced service: Tracks costs for service provided by the county, as well as new service managed by transit agencies operating in Clackamas County.

Other Planning Efforts

In addition to Clackamas County, there are six other transit providers in the county. These providers are better suited to track more traditional transit service metrics, such as on-time performance, farebox recovery, cost per service hour, annual passenger trips, and so on. Since Clackamas County is taking a larger role in the disbursement of STIF funds, it is important that these transit providers keep the county informed of these metrics so the county can take a system-wide approach when searching for solutions to transit challenges as they arise.

In addition, ODOT is leading a strategic planning project to improve transit services on and around Mt. Hood. The Vision Around the Mountain project is bringing together several partners from the TDP, including Clackamas County, Mt. Hood Express, ODOT, SAM, and TriMet to form a cohesive vision for transit in the Mt. Hood area. The county should work to ensure that the Vision Around the Mountain goals and performance measures are in alignment.

TDP UPDATE SCHEDULE & NEXT STEPS



TDP Update Schedule & Next Steps

The TDP should be updated every five years or so, roughly in line with the short-, medium-, and long-term recommendations implementation. This will allow the County to monitor progress in implementing identified projects, update the future financial outlook and planning, and verify the population, land use, and growth trends used to determine and prioritize service enhancements. Clackamas County needs to update its STIF plan every two years per the STIF rules, but such a plan does not necessitate an update to the TDP.

REFERENCES

References

A. *Public Involvement Plan*

B. *Outreach Summary*

C. *Goals, Objectives, and Performance Measures Memorandum*

D. *Background Information and Existing Conditions Memorandum*

E. *Title VI Assessment*

F. *Needs Identification Memorandum*

G. *Future Solutions Strategies Memorandum*