



CLACKAMAS COUNTY TRANSIT DEVELOPMENT PLAN



NEEDS IDENTIFICATION

AUGUST 14, 2020





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Date August 14, 2020

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Project Clackamas County Transit Development Plan

Subject Needs Identification Memo (Subtask 3.2)



NEEDS IDENTIFICATION

This memorandum inventories the existing performance, transit markets, and identified needs for transit in Clackamas County. The purpose of this memorandum is to summarize the performance and needs of the system as a foundation for future service opportunities. This information will help guide development of the Clackamas County Transit Development Plan (TDP).

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Executive Summary

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

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

Given finite budget resources to provide transit service, this project will need to develop priorities for how service can be improved. The needs identified in this memorandum will support the development of the *Assessment of Future Service Opportunities Memorandum*.

Needs Related to Existing Transit Performance

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

- **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 without Transit Access:** The following areas lack local transit service: Damascus, Boring, Estacada, Eagle Creek, Jennings Lodge-Oak Grove-Oatfield, Clackamas Industrial Area. Additionally, 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.
- **Walking and Bicycling Access:** Key areas lacking pedestrian and bicycle access are rural highways lacking formal pedestrian and bicycle facilities, as well as shoulders that can be used as

waiting areas and bus pullouts. Focusing improvements on pedestrian and bicycle facilities along highways that have transit service can help improve access to transit in rural areas.

- **Service to Underrepresented Communities:** The following areas with significant or concentrated underrepresented communities also lack existing 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, and a lack of 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 a lack of service on several regional corridors, including OR 212 between the Clackamas Industrial Area and Damascus/Boring, Interstate 205 between West Linn and Tualatin/Wilsonville, and on OR 211 between Molalla to Woodburn.
- **Population Served:** Transit-supportive areas without transit include the Clackamas Industrial Area, western West Linn, southern and western Oregon City, Damascus and the C2C Corridor, and southern Canby.
- **Service Span and Frequency:** By headway and service span level of service (LOS), 84% of all transit routes in the county are at LOS D or better for headway and 63% of all transit routes in the county are at LOS D or better for service span. Outside of the TriMet district, there is not much weekend service, especially on Sundays, on intercommunity routes.
- **Service Hours per Capita:** Increases to service span, service frequency, or both can help improve transit service levels to people in rural Clackamas County. Additionally, increased transit service in urban areas can raise Clackamas County service closer to 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. Improvements to ease of fare payment and information such as real-time vehicle arrival can improve the riding experience for existing riders and can also attract new riders. Technology such as automated passenger counters provides useful information for planning and operating service.

New Corridors

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

- Extension of the Mt. Hood Express from Sandy along Highway 212, connecting Damascus, Boring, and the Clackamas Industrial Area to Clackamas Town Center.
- Extension of TriMet Route 87 along the future C2C Corridor on SE 172nd Avenue and SE 190th Avenue connecting Damascus, Happy Valley, and Gresham.
- Extension of TriMet Routes 155 or 156 connecting to Damascus via Sunnyside Road and more of Happy Valley to the north of existing service.
- Modifications to TriMet Routes 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 scheduled to be implemented September 2020.**

- Generally, route modifications can provide additional connections to/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 [9608 SE Fuller Rd, Happy Valley], Maple Apartments [14338 S. Maple Lane Ct, Oregon City], and Good Shepard Village [12596 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 areas as system integration, fares, timetables, transportation planning efforts, and trip planning applications/software.
- Increasing schedule reliability and efficiency through coordination efforts between transit providers
- Making transit easier to ride 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 to this area can make for a safer, more comfortable first or last mile to the Sandy-Estacada Route and TriMet Route 30 Estacada.
- Improving bus stops with signage, benches, illumination, and/or shelters
- Working with local agencies to identify potential developer-funded transit sites (e.g., bus stops and related amenities such as sidewalks), especially those serving residential development, 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.

Project Purpose

The intent of the Clackamas County Transit Development Plan (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, the TDP will:

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

TDP work will be focused in two areas:

- *Within the Clackamas County portion of the TriMet service area, the TDP will provide 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 service providers, e.g., Wilsonville, Canby, Molalla, Sandy, is addressed in those providers' TDPs, which are reviewed in the *Background Information and Existing Conditions Memorandum*.)*
- *In unincorporated areas located between existing service providers and with no current transit service provider, the TDP will recommend how transit service providers can cover these areas in the future and how existing transit services across the county can be better connected.*

Overview

The *Background Information and Existing Conditions Memorandum* examines existing transit resources in Clackamas County. With this foundation, this memorandum identifies areas of transit need across the county.

- The evaluation criteria from the *Goals, Objectives, and Performance Measures Memorandum* were measured using existing conditions data to understand transit needs.
- Gaps identified in previous regional planning efforts from TriMet and Metro were reviewed for needs in Clackamas County.
- Feedback from survey respondents and other outreach participants will be incorporated into the needs assessment.

Together, these sources create an overall list of transit needs for Clackamas County.

Existing Transit Performance

This section describes the strengths and limitations of transit service in Clackamas County relative to the goals, objectives and performance measures established in the *Goals, Objectives, and Performance Measures Memorandum*. Most performance measures were assessed in the existing conditions, which are summarized here, in addition to several new assessments.

System Connectivity

This section describes performance measures related to links within the transit systems, including intercommunity connections, communities with transit access, and walking and bicycle access.

Intercommunity Connections

This evaluation criterion measures new or enhanced transit links between communities. This evaluation includes reviewing mapped transit routes and their frequencies, community population sizes, and census data to identify needs and gaps.

As outlined in the *Background Information and Existing Conditions Memorandum*, these are the findings on intercommunity connections in the county and from the county to outside destinations:

- Oregon City can be reached by transit from a majority of incorporated communities in the county in less than an hour with one or no transfers.
- Wilsonville is not directly connected to Oregon City or West Linn. The only nonstop destination from Wilsonville in Clackamas County is Canby.
- Gresham, a major regional jobs destination for Clackamas County residents, is challenging to reach by transit from Clackamas County, with two transfers required to travel between Happy Valley and Gresham. Within Clackamas County, only Sandy residents are able to reach Gresham in less than 30 minutes and without a transfer.
- The SE Park Avenue MAX Station, the southern terminus of the MAX Orange Line, is broadly accessible by frequent service bus and rail lines. However, only residents in Oregon City, Gladstone and Milwaukie can reach this station by transit without transferring.
- Clackamas Town Center is reachable in two transfers or less from every incorporated community in northern Clackamas County. While many locations in Multnomah County can reach Clackamas Town Center on light rail, very few communities in Clackamas County can use light rail to get there.
- Intercommunity routes outside the Portland metropolitan Urban Growth Boundary include Wilsonville-Canby, Canby-Oregon City, Canby-Molalla, Molalla-Oregon City, Sandy-Gresham, Sandy-Estacada, and Sandy-Mt. Hood. East-west connections are limited in rural Clackamas County.

Figure 1 and Figure 2 show transit routes at the countywide and Portland metropolitan area scales, respectively. These maps highlight areas with limited transit service between cities and/or unincorporated areas. These figures illustrate the findings above: a lack of direct service to Gresham, a lack of east-west service across the county, and no service on Highway 212 between Damascus and Boring.

Takeaway: *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 without Transit Access

This evaluation criterion measures the number of communities that do not have transit service. Similar to Intercommunity Connections, this qualitative evaluation reviews mapped transit routes and their frequencies, community population sizes, and census data to identify needs and gaps. Both intercommunity routes and local service are incorporated. This section summarizes existing conditions information and identifies needs from these assessments.

As outlined in the *Background Information and Existing Conditions Memorandum*, the following are the findings for communities that lack transit access in the county:

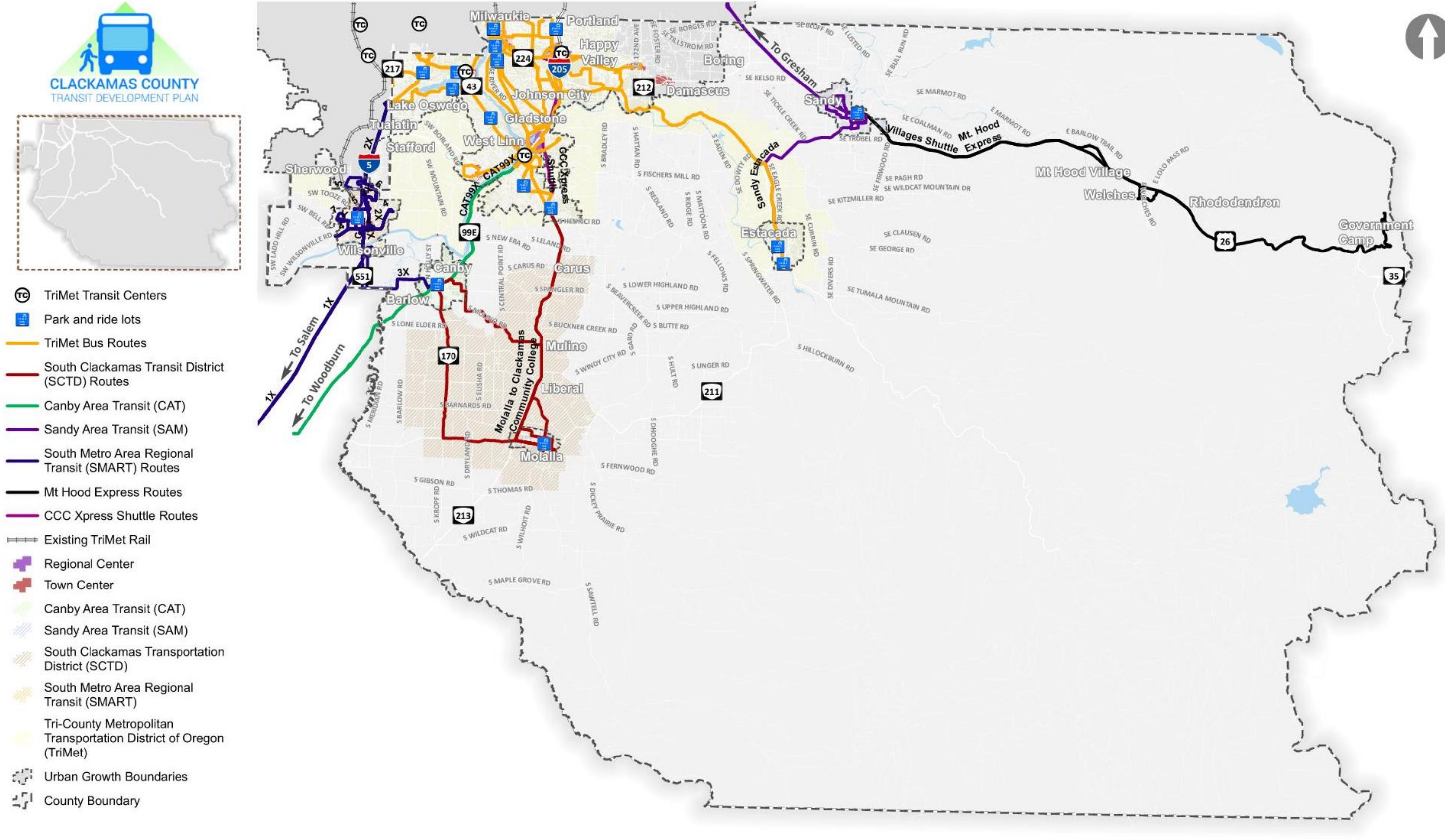
- Areas east of 172nd Avenue in Happy Valley, Damascus, and Boring have no connections to transit.

- Only one TriMet route runs along OR 212 in the Clackamas Industrial Area. Additional industrial development is expected with no other transit access to or within the area.
- Limited service is available between Jennings Lodge, Oak Grove, Oatfield, and Clackamas Town Center.
- Limited service is available for Estacada and Eagle Creek, and there is no local service.
- Outside of downtown Oregon City or the Molalla Avenue corridor, transit service is lacking in Oregon City. There are several urban reserve areas that could expand the city and expand the area without transit service.

Figure 1 and Figure 2 are instructive for evaluating where transit service is provided by an intercommunity route. The Clackamas Industrial Area to the south and east of Clackamas Town Center is served only by intercommunity connections. Service between Clackamas Town Center and Estacada serves the Clackamas Industrial Area and the communities of Eagle Creek and Estacada, but there is no local service.


Takeaway: *The following areas lack local transit service: Damascus, Boring, Estacada, Eagle Creek, Oregon City, Clackamas Industrial Area. Additionally, 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.*




















Figure 1. Transit Overview – County Extents

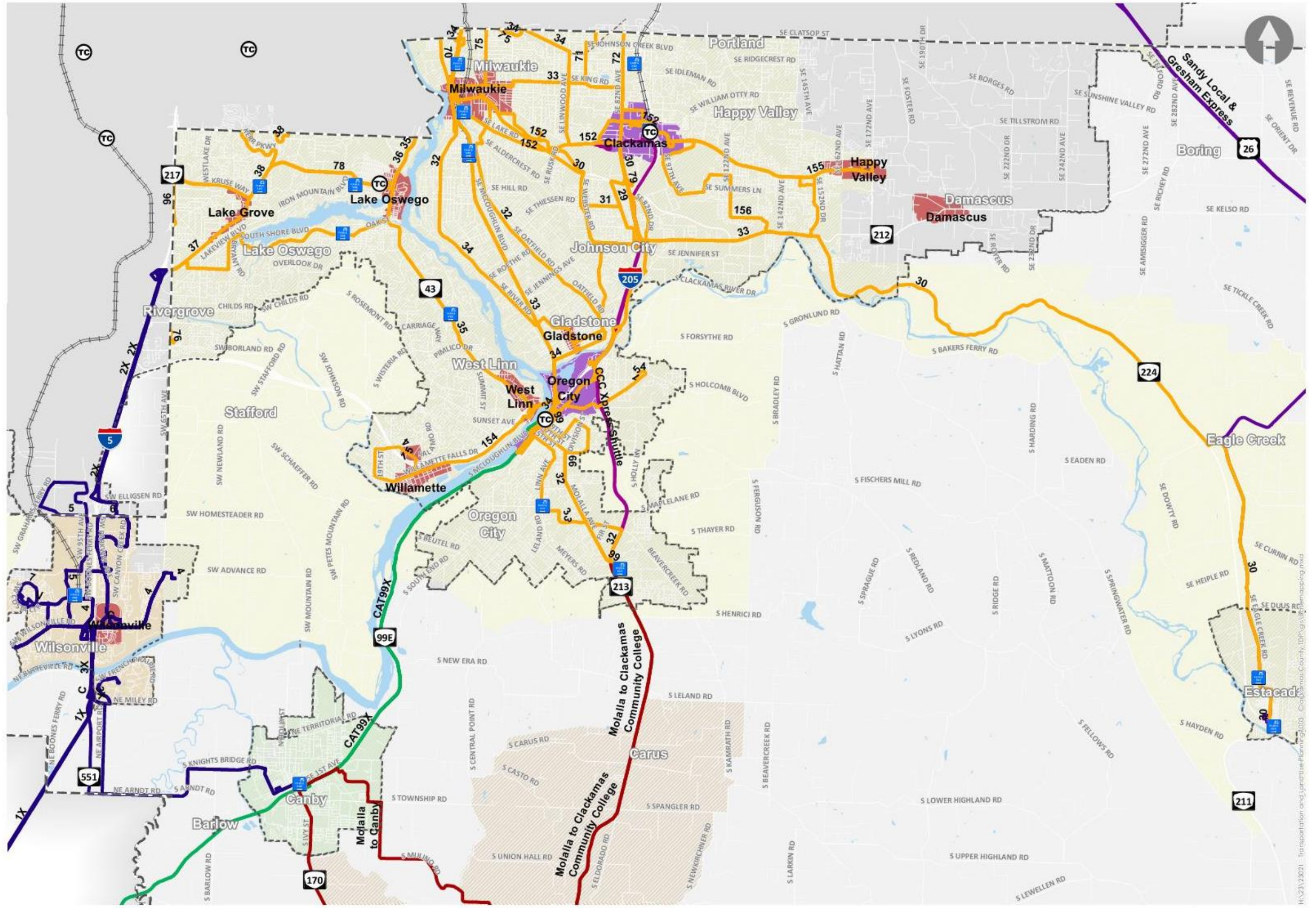


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Figure 2. Transit Overview – TriMet Extents



-  TriMet Transit Centers
-  Park and ride lots
-  TriMet Bus Routes
-  South Clackamas Transit District (SCTD) Routes
-  Canby Area Transit (CAT)
-  Sandy Area Transit (SAM)
-  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



Walking and Bicycling Access

This evaluation criterion measures the percentage of transit stops that have a sidewalk/path or bicycle lane/path connecting to the stop. As pedestrian and bicycle facility data are limited in most of Clackamas County, this needs analysis does not evaluate all transit stops for sidewalk and bicycle connections. While a quantitative analysis will not be completed as part of this project, Technical Advisory Committee (TAC), Project Advisory Committee (PAC), and public feedback will help to identify locations with limited pedestrian and bicyclist access. In Clackamas County, major pedestrian and bicycle access issues are along rural highways, such as Highway 213 and Highway 224. These areas not only lack pedestrian and bicycle facilities, but also lack shoulders that can be used as waiting areas and bus pullouts.

Takeaway: *Key areas lacking pedestrian and bicycle access are rural highways lacking formal pedestrian and bicycle facilities, as well as shoulders that can be used as waiting areas and bus pullouts. Focusing improvements on pedestrian and bicycle facilities along highways that have transit service can help improve access to transit in rural areas*

System Accessibility

This section describes performance measures related to access to transit, including service to underrepresented communities and access to jobs.

Service to Underrepresented Populations

This evaluation criterion compares the percentage of subsets of the general population that have not been equitably represented, such as low-income households and people with disabilities, living within ¼ mile of transit stops. The following sections compare these groups across service boundaries, and the subset of the general population of focus are those represented in historic planning decisions and processes, as well as are more likely to face higher transportation barriers today. For this purpose, these populations are also referred to a “transportation-disadvantaged.” This section summarizes existing conditions information and identifies needs from these assessments.

As outlined in the *Title VI Assessment Report*, these are the findings for transit service to transportation-disadvantaged populations:

- Clackamas County's population was estimated to be 399,962 people in 2017. The TriMet service area within Clackamas County contains 282,575 people in 2017, or 70.7% of the county population.
- 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 communities of color than the state of Oregon as a whole. In Clackamas County, 8.4% of residents identify as Hispanic/Latino and 4.1% identify as Asian.
- 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%. Of the 12.5% of the population who speak a language other than English, approximately 4.3% speak English less than very well, meaning they have limited English proficiency.
- The median household income in 2017 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 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.

The following figures and discussion highlight populations that are typically reliant on transit and examine whether there is existing transit service for these populations. All maps are from Remix software, with demographics based on census information and with routes for all transit providers in the county shown on each map. Areas to the east of Mt. Hood Village are not shown here as the large census tract size reduces the people per square mile metrics to the lowest levels. However, these rural areas typically have higher percentages of low-income households, elderly populations, and people with disabilities than more urban areas.

Figure 3 shows the number of people per square mile who are living at or below 200% of the federal poverty limit. The data is displayed by census block group. While many areas with higher levels of poverty are covered by transit, there are some areas that lack transit access. These areas include Eagle Creek, areas east of Molalla, Gladstone, north of Gladstone near Jennings Lodge and Oak Grove, and the outskirts of Oregon City.

Figure 3. Population Living Below 200% of the Federal Poverty Level

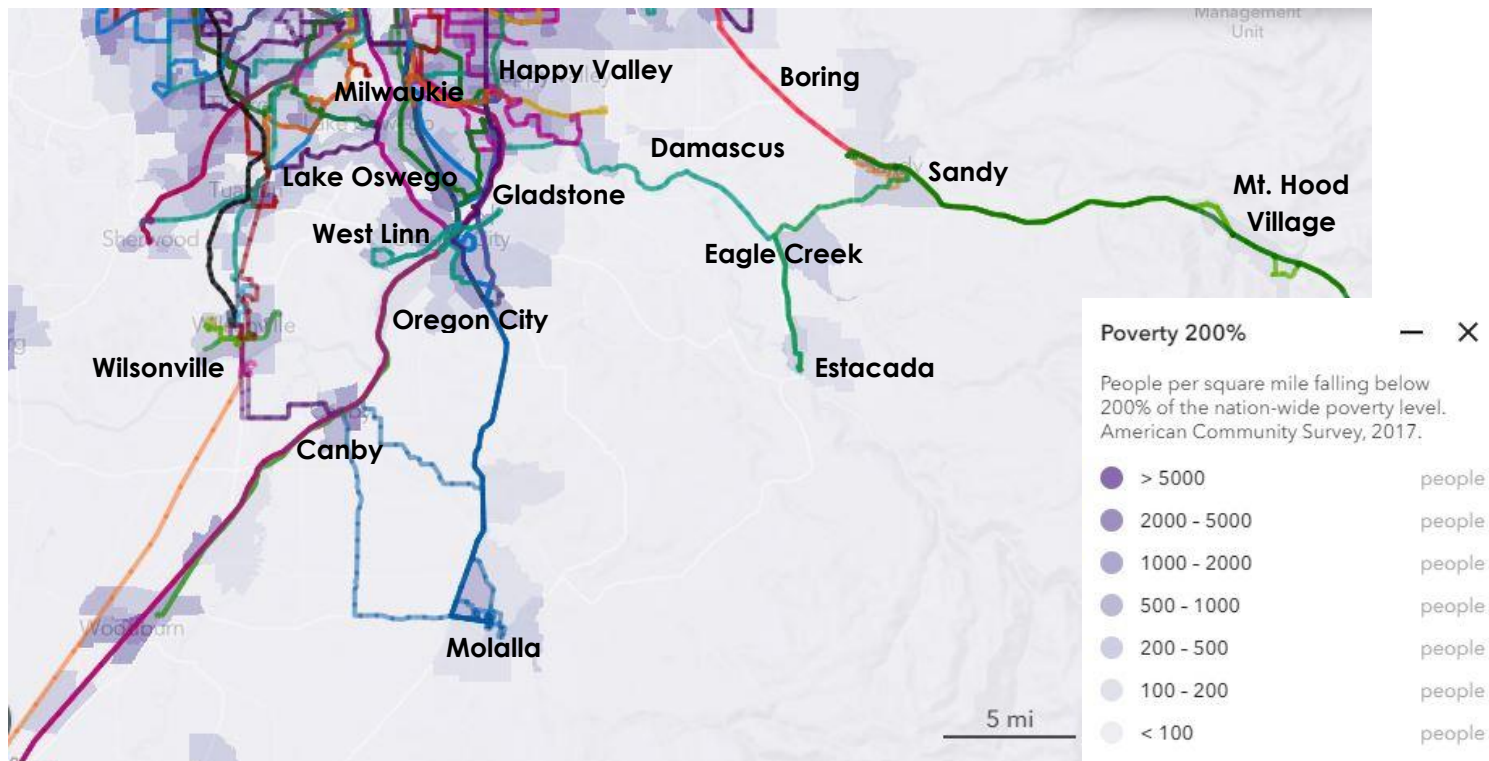


Figure 4 shows the number of people per square mile who are of a community of color (defined as non-White or of Hispanic origin). The data are displayed by census block group. Areas with limited access to transit include North Canby, Happy Valley, and the outskirts of Oregon City.

Figure 4. Communities of Color

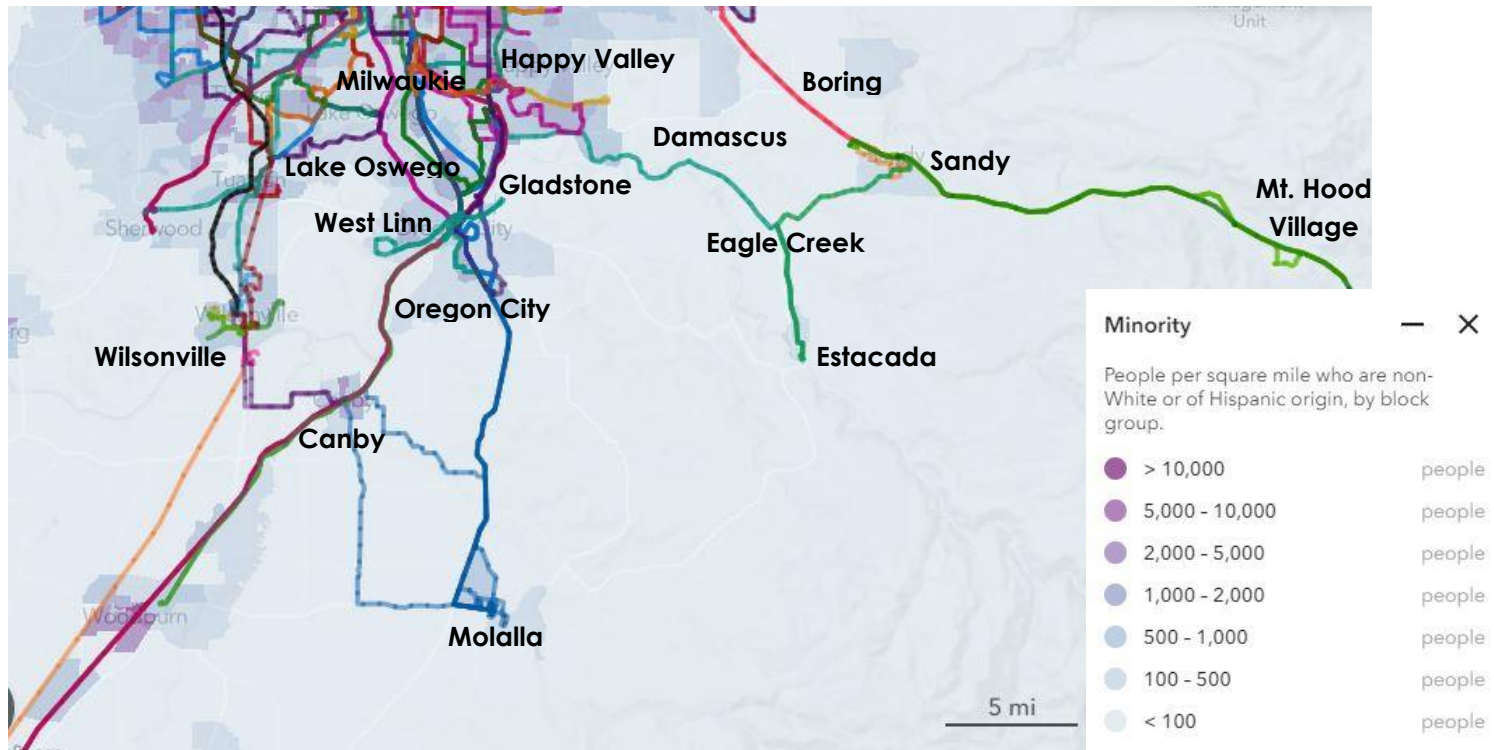


Figure 5 shows the number of households per square mile with no vehicle available. The data are displayed by census tract. The highest number of households with no vehicle available are along the McLoughlin corridor, where there is existing transit access. Areas with limited access to transit include South Canby, Gladstone, north of Gladstone near Jennings Lodge and Oak Grove, and the outskirts of Oregon City.

Figure 5. Car-Free Households

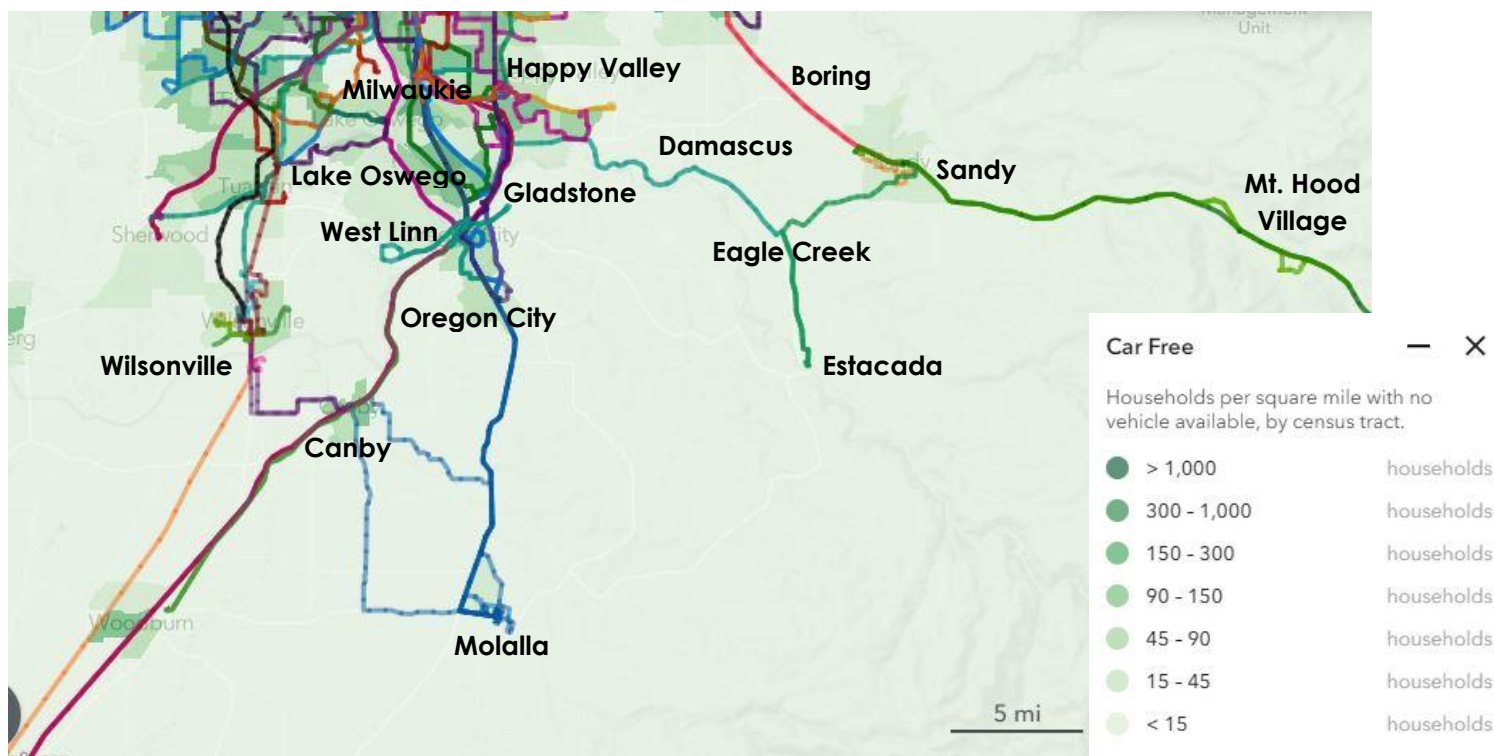
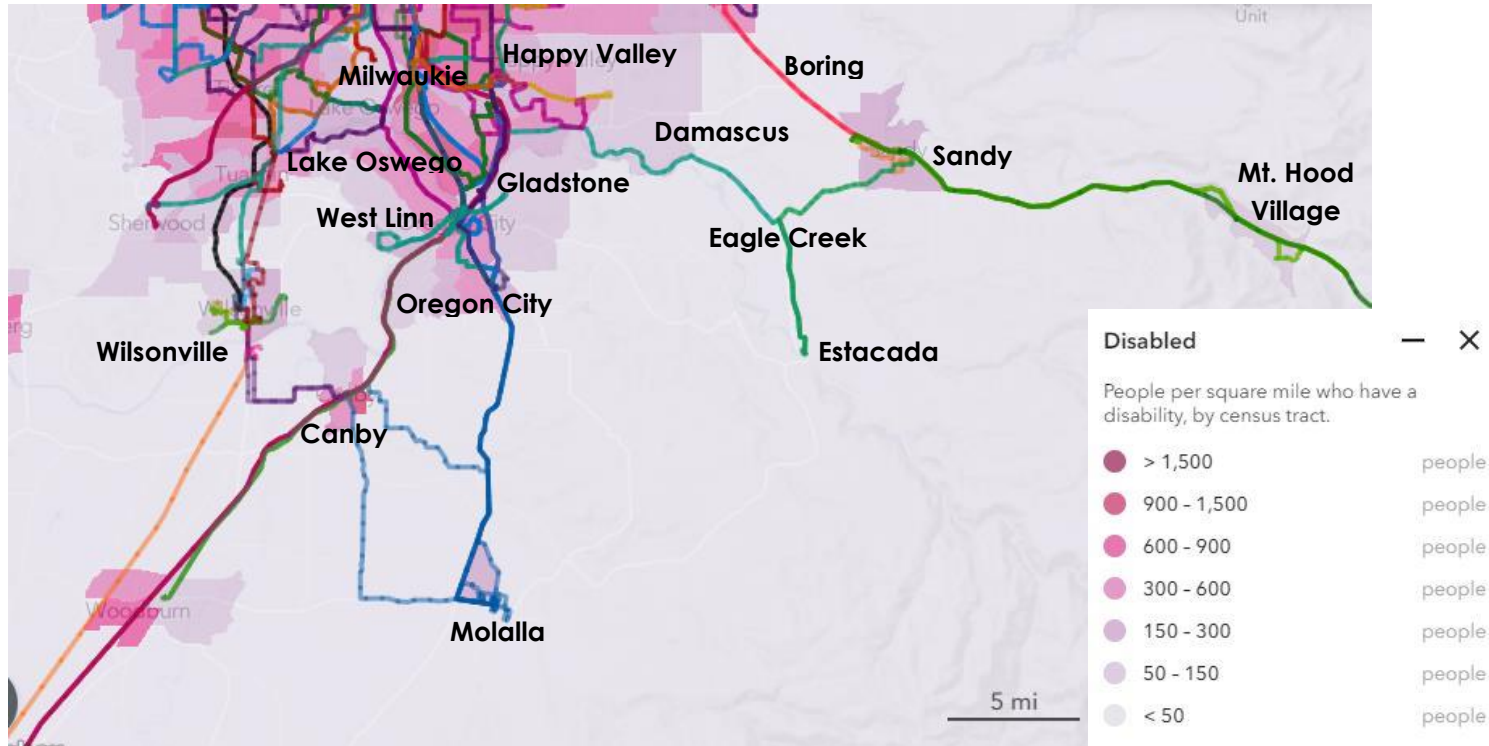


Figure 6 shows the number of people per square mile who have a disability. The data are displayed by census tract. Areas containing larger numbers of people with disabilities with limited access to transit include south of Oregon City between Highway 99E and OR 213, Damascus, north of Gladstone near Jennings Lodge and Oak Grove, and areas outside downtown Canby.

Figure 6. People with an Identified Disability



Takeaway: The following areas with significant or concentrated underrepresented communities also lack existing transit service: Oregon City outskirts, areas around Canby, Eagle Creek, Happy Valley, Jennings Lodge/Oak Grove, 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

This evaluation criterion compares the percentage and number of jobs within ¼ mile of transit stops using TNext¹, using existing conditions information and identifying needs from these assessments.

Figure 1 and Figure 2 show transit connections into Portland from several locations in the county, and also show connections into Gresham and Washington County from specific locations such as Sandy and Wilsonville, respectively. As outlined in the *Background Information and Existing Conditions Memorandum*, the following findings relate to access to jobs in the county:

- Portland is the most common destination for employed county residents. Nearly one-third (31.8%) of these persons worked in Portland.

¹ TNext, which stand for Transit Network Exploration Tool, was developed by ODOT to report and analyze transit service information and is based on GTFS and census data

- Portland is also the most common home location for employees working in Clackamas County. Portland is home to 17.7% of all employees in Clackamas County. Gresham (4.3%) and Oregon City (4.2%) at the second and third most common home locations for employees in the county. The top two home locations for employees were outside Clackamas County.
- Four of the top 10 employment destinations for employed persons living in Clackamas County were cities within the County: Oregon City, Lake Oswego, Wilsonville, and Milwaukie.
- Four of the top 10 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 reach work.
- Land use growth is anticipated near Wilsonville/Stafford, Oregon City, and Damascus/Boring.

Major employment locations inside the county have inconsistent levels of transit service. Clackamas Town Center is well-served by transit, for example, while the Clackamas Industrial Area nearby has only one TriMet route running through it between Clackamas Town Center and Estacada. Wilsonville is also a major jobs center, but employees living in most locations in the county must travel by indirect routes through Portland or Canby to reach it. In addition, the various campuses for Clackamas Community College are a major destination with many students and staff – improving connections to these locations, or to the college's Xpress Shuttle, is important.

Takeaway: *There are few direct connections from Clackamas County to major employment areas in Gresham and Washington County, and a lack of 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.*

System Mobility

This section describes measures related to the flexibility and adaptability of transit service, including service on regional corridors, population served, service spans and frequency, service hours per capita, and system ease of use.

Service on Regional Corridors

This evaluation criterion measures service by number of runs per day from existing conditions information and identifies needs from these assessments.

Figure 1 and Figure 2 show existing transit service within Clackamas County by transit provider, while Figure 7 shows the aggregate number of trips on regional corridors compared to average annual daily traffic (AADT). Regional corridors are those with estimated average annual daily traffic (AADT) of 5,000 vehicles per day or more. Traffic volumes were drawn from ODOT's TransGIS tool. It should be noted that some corridors have higher freight traffic compared to passenger vehicle traffic, and that transit on the corridor does not correlate to passenger demand. This service on regional corridors criteria represents a high-level assessment of transit availability compared to travel demand. Findings are as follows:

- Interstate 205:
 - ◆ 50 daily transit trips between Clackamas Town Center and Oregon City on a route adjacent to Interstate 205 (TriMet Route 79 and the Clackamas Community College Xpress Shuttle),
 - ◆ 16 daily transit trips between Oregon City and West Linn's Willamette neighborhood on a route adjacent to Interstate 205 (TriMet Route 154).
 - ◆ Otherwise, there is no transit service on or adjacent to Interstate 205 between West Linn and Tualatin or Wilsonville.

- ◆ Interstate 205 has the lowest transit trips compared to vehicle trips, as shown in Figure 7.
- US 26:
 - ◆ 33 daily transit trips between Gresham and Sandy,
 - ◆ 15 daily transit trips between Sandy and Mt. Hood Village, and
 - ◆ 12 daily transit trips between Mt. Hood Village and Government Camp/Timberline Lodge.
- OR 99E:
 - ◆ 84 daily transit trips between Milwaukie and Oregon City (TriMet Routes 33 and 99),
 - ◆ 48 daily transit trips on routes adjacent to OR 99E (TriMet Routes 32 and 34).
 - ◆ 26 daily transit trips between Oregon City and Canby,
 - ◆ 14 transit trips between Canby and Woodburn.
- OR 43:
 - ◆ 47 daily transit trips between Portland and Oregon City, which also stop in Lake Oswego and West Linn.
- OR 211:
 - ◆ 5 daily transit trips between Sandy and Eagle Creek,
 - ◆ 27 daily transit trips between Eagle Creek and Estacada, and
 - ◆ 10 daily transit trips between Molalla and Hamricks Corner.
 - ◆ No transit service on the remaining portions of OR 211 in Clackamas County, including between Estacada and Molalla and between Molalla and Woodburn.
- OR 212:
 - ◆ 22 daily transit trips between Clackamas Town Center and Rock Creek Junction.
 - ◆ No service east of Rock Creek Junction, including to Damascus and Boring.
- OR 213:
 - ◆ 24 daily transit trips between Clackamas Community College and Mulino,
 - ◆ 34 daily transit trips between Mulino and Molalla.
 - ◆ No transit service in Clackamas County south of Molalla toward Silverton and Salem.
- OR 224:
 - ◆ 22 daily transit trips between Clackamas Town Center and Estacada.
 - ◆ No service south of Estacada.
- Clackamas to Columbia Corridor (C2C): C2C is a planned north-south corridor connecting Happy Valley to Gresham along SE 172nd Avenue. No north-south transit service currently operates along SE 172nd Avenue given that the complete C2C Corridor has not yet been constructed.

Takeaway: *There is a lack of service on several regional corridors, including OR 212 between the Clackamas Industrial Area and Damascus/Boring, Interstate 205 between West Linn and Tualatin/Wilsonville, and on OR 211 between Molalla to Woodburn.*

Population Served

This evaluation criterion compares the percentage of people living within ¼ mile of transit stops at different levels of service using the TNEt tool, and it summarizes existing conditions information and identifies needs from these assessments.

Figure 8 and Figure 9 show the locations of transit service relative to transit-supportive areas. These show transit-supportive areas for hourly headways and higher densities and other factors such as land use

patterns and connectivity are needed to support more frequent transit service. As outlined in the *Background Information and Existing Conditions Memorandum*, these are the findings for population served:

- Approximately 53–54% of transit-supportive areas (TSAs, areas with densities capable of supporting at least hourly weekday fixed-route service) are currently served by transit, with about the same area planned to be served in 2040, assuming no change to service. This finding indicates that growth areas are primarily located near existing transit services, but that additional service could connect currently unserved TSAs.
- Fewer people and jobs are located within ¼ mile of transit stops in Clackamas County, compared to Washington County and Multnomah County. However, a similar proportion of Clackamas County's urban population is served compared to Washington County, and a much higher proportion of Clackamas County's rural population is served compared to both Washington and Multnomah Counties.

Takeaway: *Transit-supportive areas without transit include the Clackamas Industrial Area, western West Linn, southern and western Oregon City, Damascus and the C2C Corridor, and southern Canby.*

Service Span & Frequency

This evaluation criterion compares the extent of transit service provided, including early morning/late evening service hours and weekend service, and tracks the percentage of routes operating on Saturdays and Sundays and the number of runs per day. It summarizes existing conditions information and identifies needs from these assessments.

As outlined in the *Background Information and Existing Conditions Memorandum*, the following are the findings for service span and frequency:

- By headway and service span level of service (LOS), 84% of all transit routes in the county are at Level of Service (LOS) D or better for headway and 63% of all transit routes in the county are at LOS D or better for service span.
- There are 46 fixed-route bus, community shuttle, light rail, and commuter rail routes in the county.
- Twenty-six of these routes, nearly 60%, also operate on Saturdays.
- Nineteen routes, just over 40%, also operate on Sundays.

Detailed information about procedures in the Transit Capacity and Quality of Service Manual (TCQSM), from which the LOS thresholds are derived, are included in Appendix A. While the 3rd edition of the TCQSM dropped LOS standards in favor of descriptions of services provided, the LOS standards have been maintained here for consistency with the Clackamas County Transportation System Plan.

Table 1 compares service frequency level of service (LOS) for weekday, Saturday and Sunday transit service. In general, there is a proportional decrease in LOS D routes and a proportional increase in LOS E routes between weekdays and Saturdays. The percentages in Table 1 are calculated against the total number of routes that run on either weekdays, Saturdays or Sundays at the bottom of the table.

Table 1. Service Frequency Level of Service for Weekdays, Saturdays, and Sundays

Level of Service	Approximate Frequency	Weekday Service Frequency	Saturday Service Frequency	Sunday Service Frequency
A	<10 minutes	0 routes (0%)	0 routes (0%)	0 routes (0%)
B	10-14 minutes	1 routes (2%)	1 routes (4%)	1 routes (5%)
C	15-20 minutes	10 routes (22%)	6 routes (23%)	6 routes (32%)
D	21-30 minutes	18 routes (39%)	5 routes (19%)	2 routes (11%)
E	31-60 minutes	11 routes (24%)	10 routes (38%)	6 routes (32%)
F	>60 minutes	6 routes (13%)	4 routes (15%)	4 routes (21%)
Totals		46 Weekday Routes	26 Saturday Routes	19 Sunday Routes

Table 2 compares service span LOS for weekday, Saturday and Sunday transit service. In general, transit service with a long weekday service span typically also operates on Saturdays and Sundays, while service with a shorter weekday span is less likely to run on weekends. This result may explain why there are seven routes that provide between 1-11 hours of service on Saturdays and one route that provides 1-11 hours of service on Sunday. Of the Sunday routes, nearly 80% provide at least 14 hours of service during the day.

Table 2. Service Span Level of Service for Weekdays, Saturdays, and Sundays

Level of Service	Hours of Service	Weekday Service Span	Saturday Service Span	Sunday Service Span
A	19-24 hours	12 routes (26%)	7 routes (27%)	7 routes (37%)
B	17-18 hours	9 routes (20%)	5 routes (19%)	4 routes (21%)
C	14-16 hours	14 routes (30%)	4 routes (15%)	4 routes (21%)
D	12-13 hours	4 routes (9%)	2 routes (8%)	2 routes (11%)
E	4-11 hours	6 routes (13%)	7 routes (27%)	1 route (5%)
F	0-3 hours	1 route (2%)	1 route (4%)	1 route (5%)
Totals		46 Weekday Routes	26 Saturday Routes	19 Sunday Routes

Figure 10 and Figure 11 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.

Takeaway: By headway and service span level of service (LOS), 84% of all transit routes in the county are at LOS D or better for headway and 63% of all transit routes in the county are at LOS D or better for service span. Outside of the TriMet district, there is not much weekend service, especially on Sundays, on intercommunity routes.

Service Hours Per Capita

This evaluation criterion compares the amount of transit service provided compared to the population using the TNExT tool. The *Background Information and Existing Conditions Memorandum* found that similar service hours are provided per capita in Clackamas County relative to Washington County. However, Clackamas County is less dense than Washington County, meaning that these service hours are more

broadly distributed than in nearby counties, as indicated by the smaller percentage of population served.

Takeaway: *Increases to service span, service frequency, or both can help improve transit service levels to people in rural Clackamas County. Additionally, increased transit service in urban areas can raise Clackamas County service closer to neighboring Washington and Multnomah counties.*

System Ease of Use

This evaluation criterion tracks improvements that make traveling between communities and transit providers easier. These improvements could include fare integration, technology improvements, and timed transfers.

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

- Each service has its own unique fare system that is not used by 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 funding for a fare study to evaluate reciprocity (i.e., fares that work across multiple systems) for these providers.
- 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 via a credit or debit card.

Only TriMet and SMART currently have real-time vehicle arrival information available, and only TriMet currently uses automated passenger counters, although SCTD and SMART are in the process of implementing one or both technologies. Timed transfers are provided between transit operators at different locations. For example, CAT and SCTD have adjusted their schedules to provide a pulsed connection at the Canby Transit Center. Buses are timed to overlap their arrival and departure, allowing for minimal transfer wait time.

Takeaway: *There is no common fare system or fare reciprocity across Clackamas County transit providers, and few providers use real-time vehicle arrival technology. Improvements to ease of fare payment and information such as real-time vehicle arrival can improve the riding experience for existing riders and can also attract new riders. Technology such as automated passenger counters provides useful information for planning and operating service.*

Table 3. Technology and Fare Systems in Clackamas County

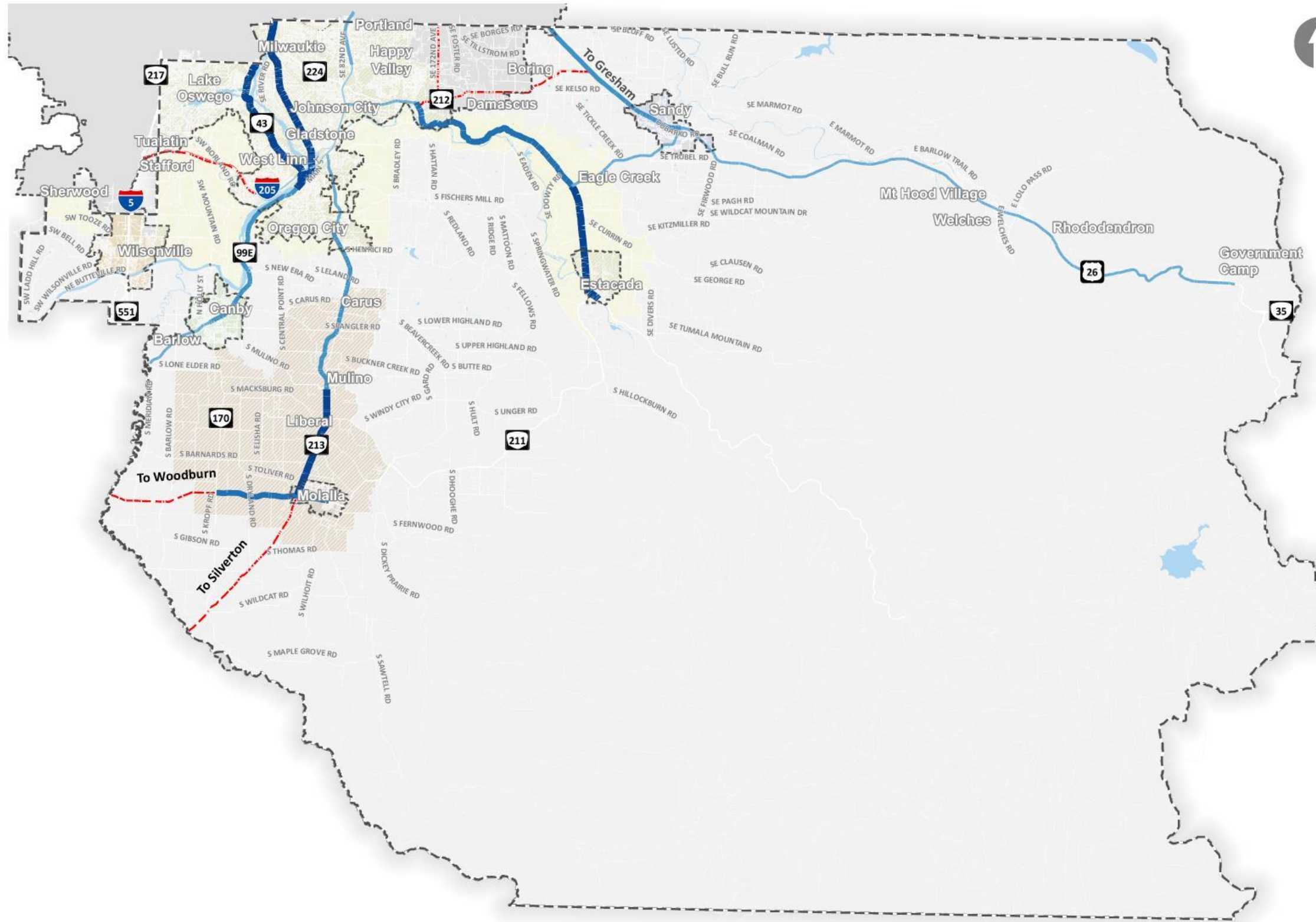
Transit Agency	Fare System	Real-Time Vehicle Arrival	Automated Passenger Counters
CAT	Cash, Paper Ticketing, Monthly Pass	No	No
CCC Xpress Shuttles	Free	Yes (on TripShot App only)	No
Mt. Hood Express	Cash	No	No
SAM	Cash, Paper Ticketing, Monthly Pass (Routes within Sandy are free)	No	No
SCTD	Cash, Paper 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 7: Regional Corridor Service



Transit Trips per 10,000 AADT

- No Existing Transit Service
- 10 or fewer Trips
- 11 - 20 Trips
- 21 - 30 Trips
- 31 - 40 Trips
- More than 40 Trips
- 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



Transportation and Land Use Planning, 0303 - Clackamas County TDP, gis/Highway Service Frequency Map.mxd

Figure 8: Transit-Supportive Areas – County Extents

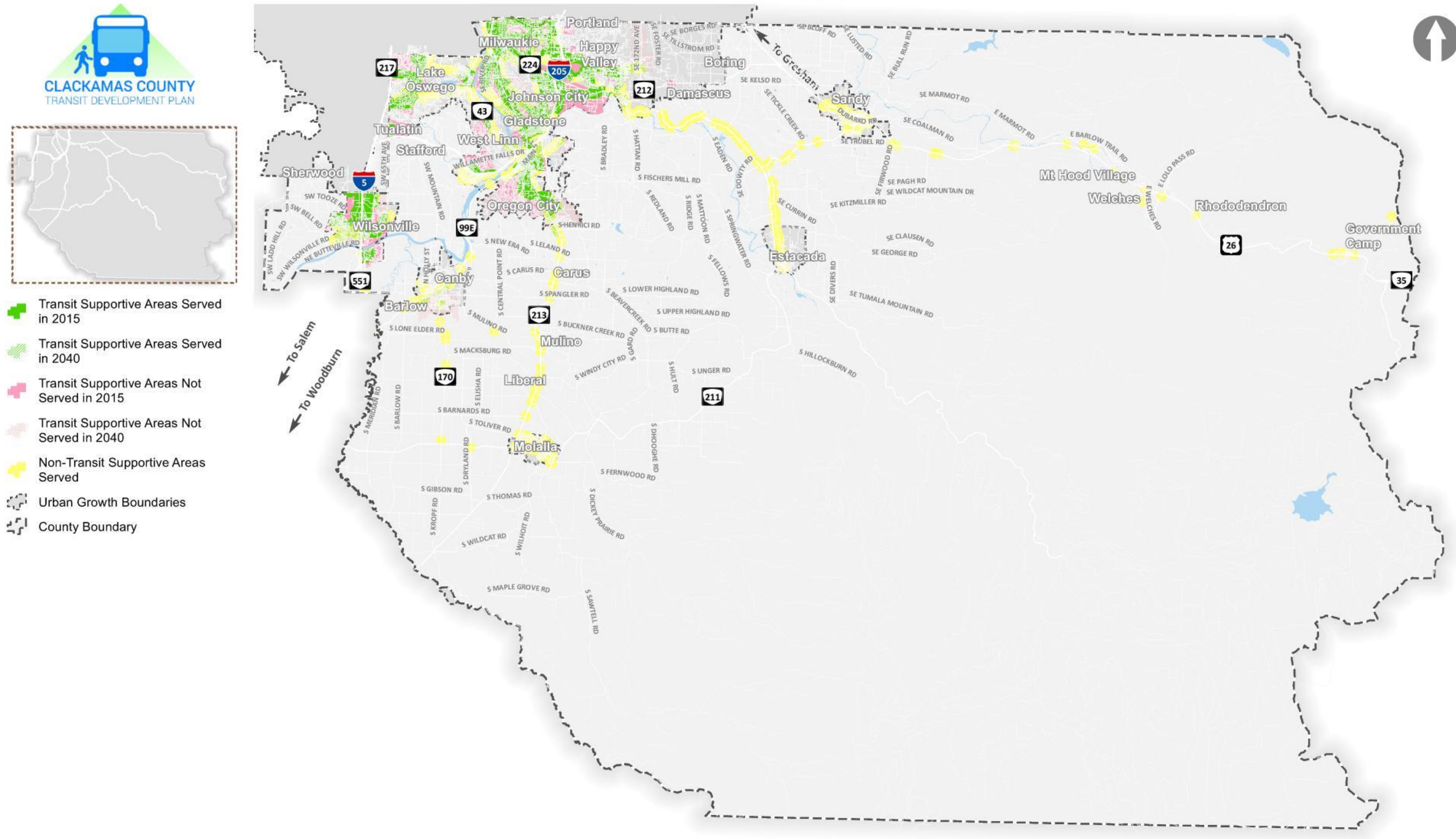


Figure 9: Transit-Supportive Areas – TriMet Extents

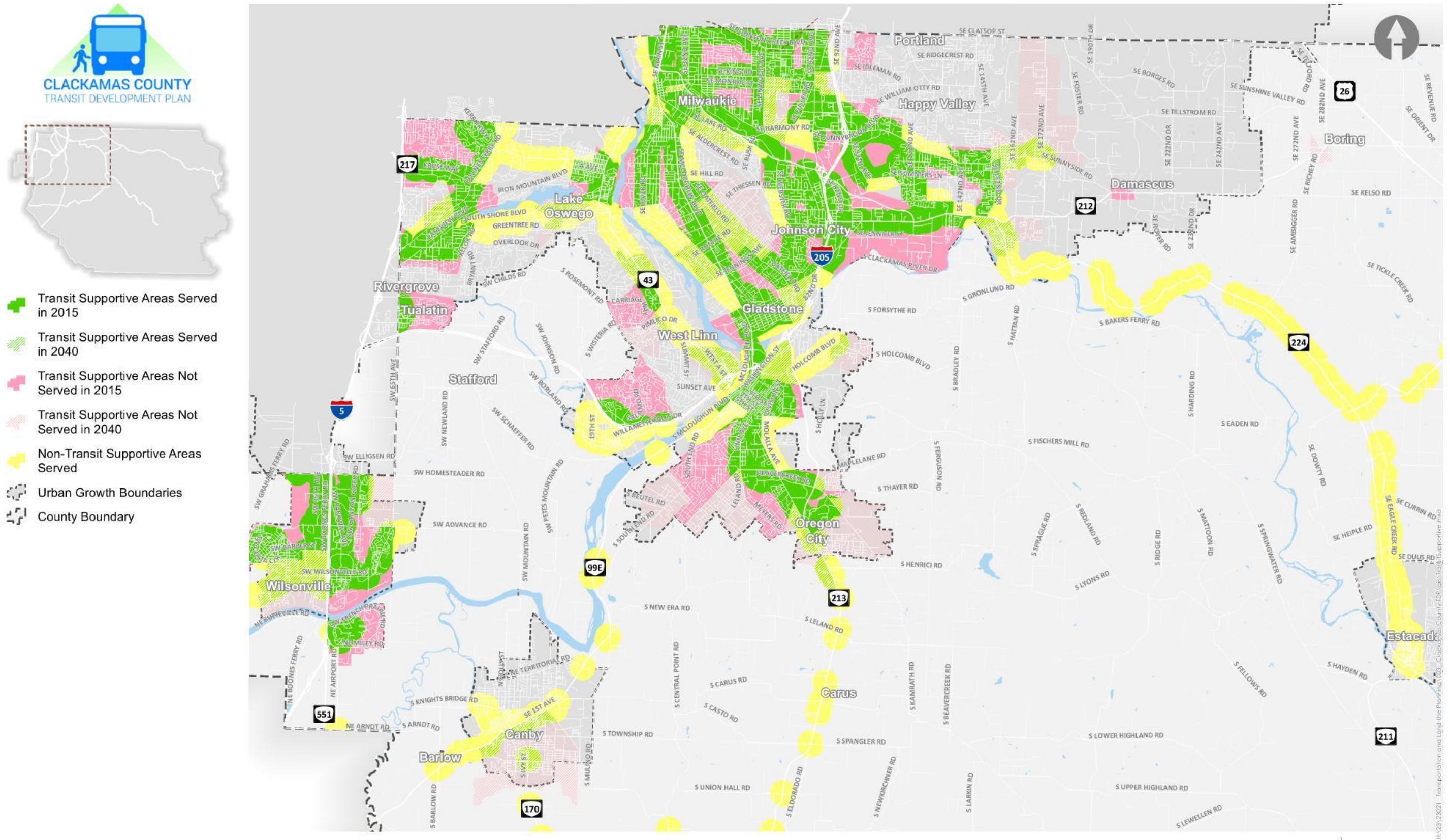
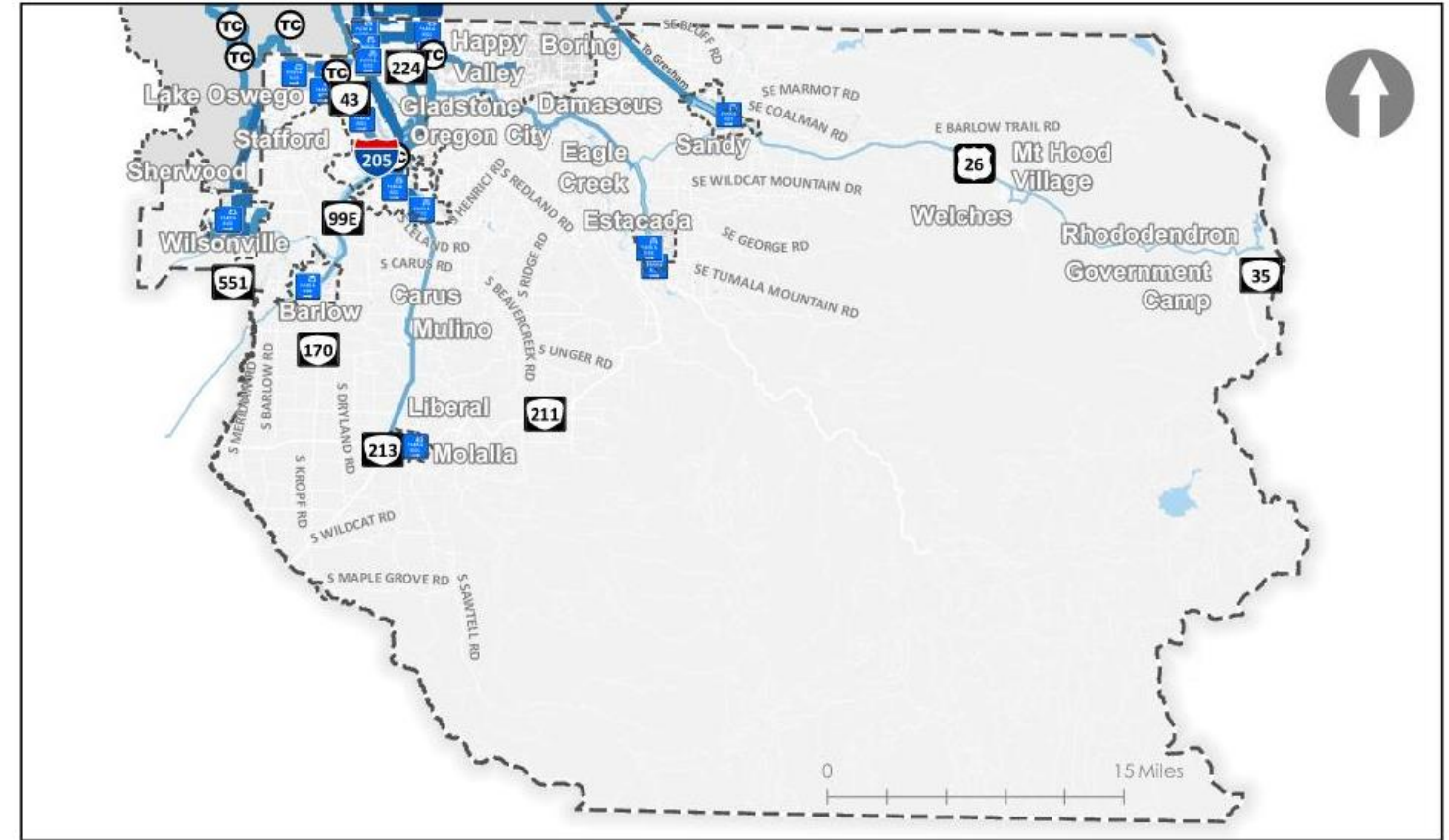
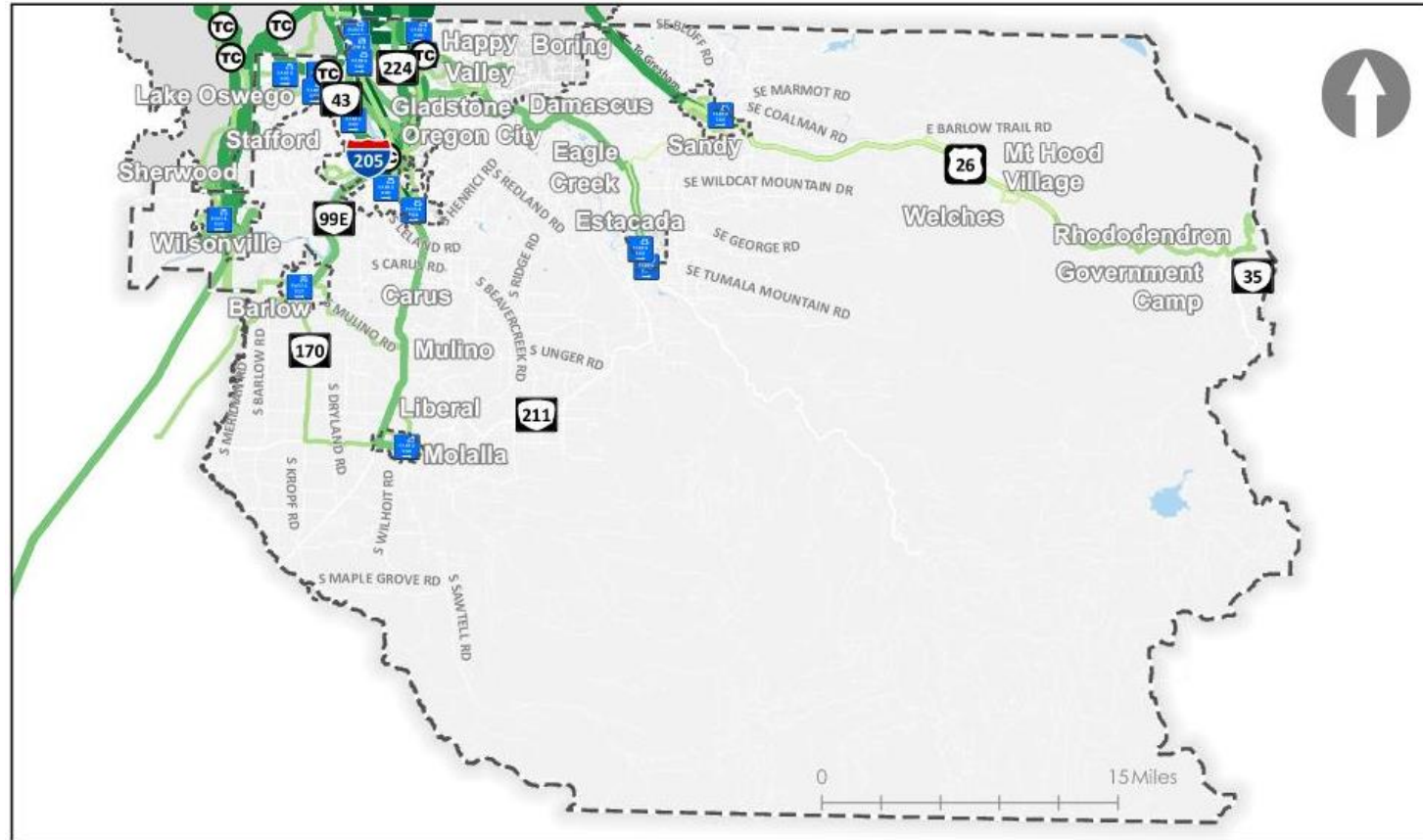


Figure 10: Weekday, Saturday, and Sunday Service Frequency – County Extents



Legend

Transit Centers	Weekday Transit	Saturday Transit	Sunday Transit
Park and ride lots	8 or Fewer Runs per Day	8 or Fewer Runs per Day	8 or Fewer Runs per Day
Urban Growth Boundaries	9 - 16 Runs per Day	9 - 16 Runs per Day	9 - 16 Runs per Day
County Boundary	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

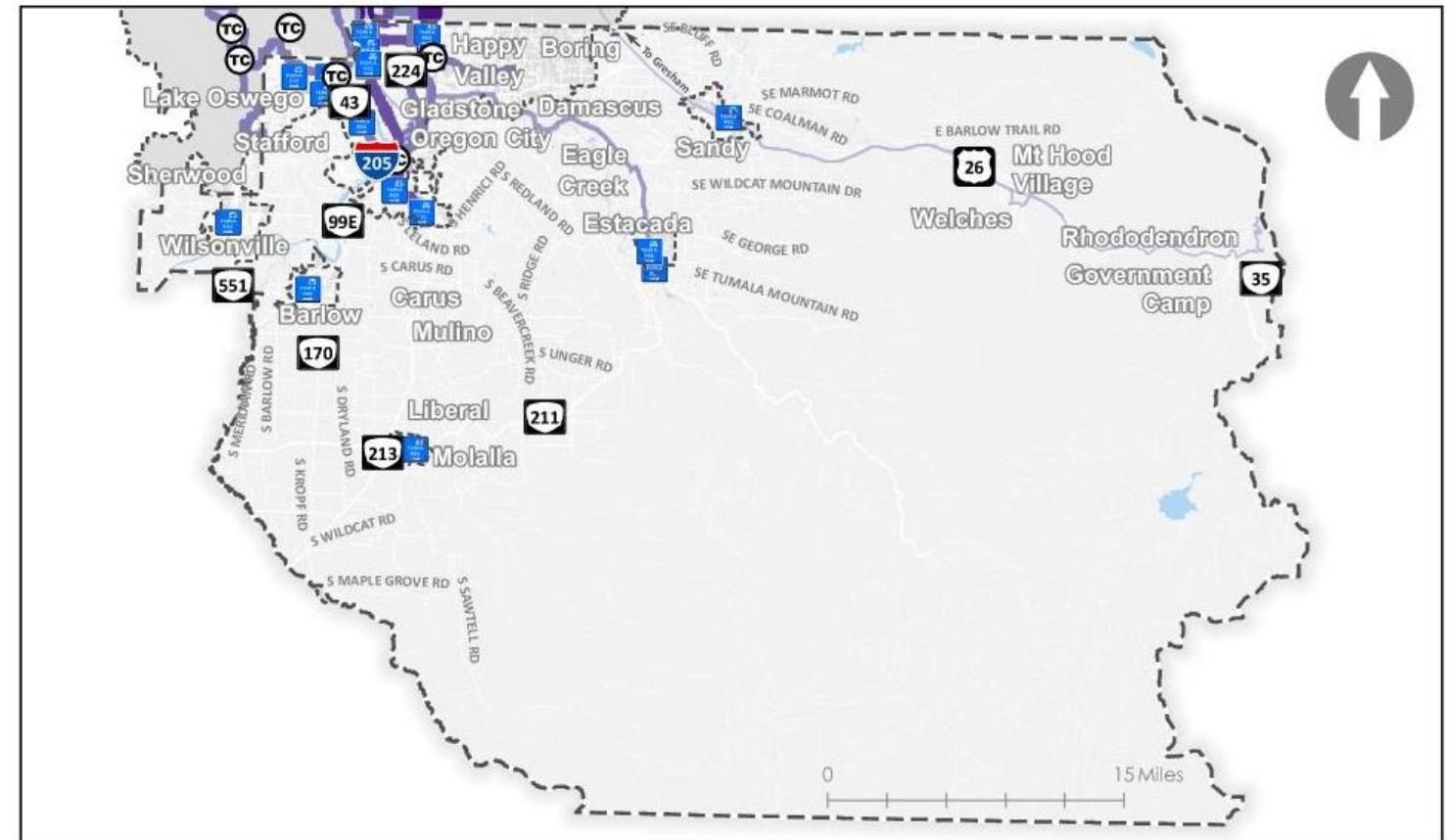
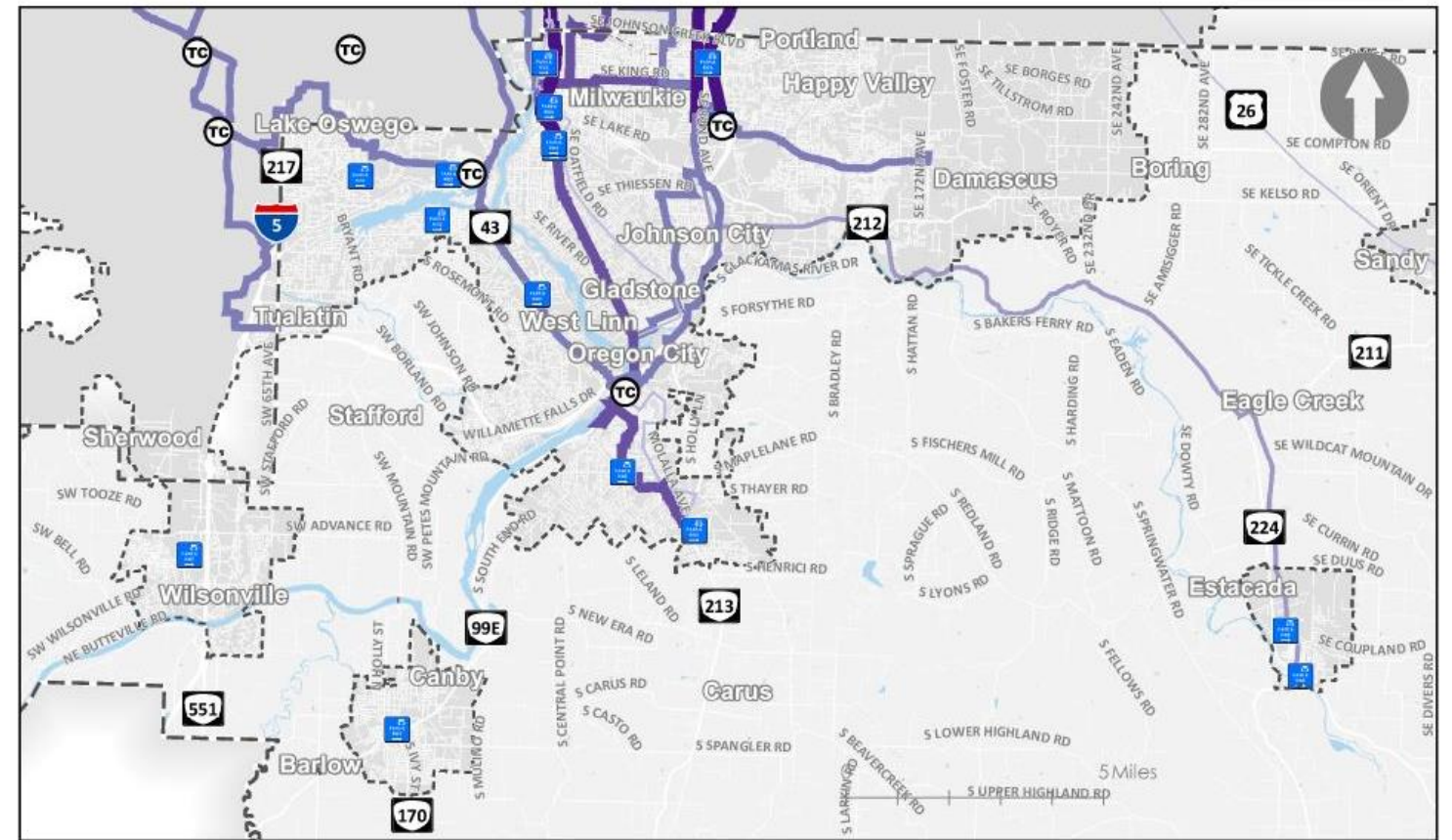
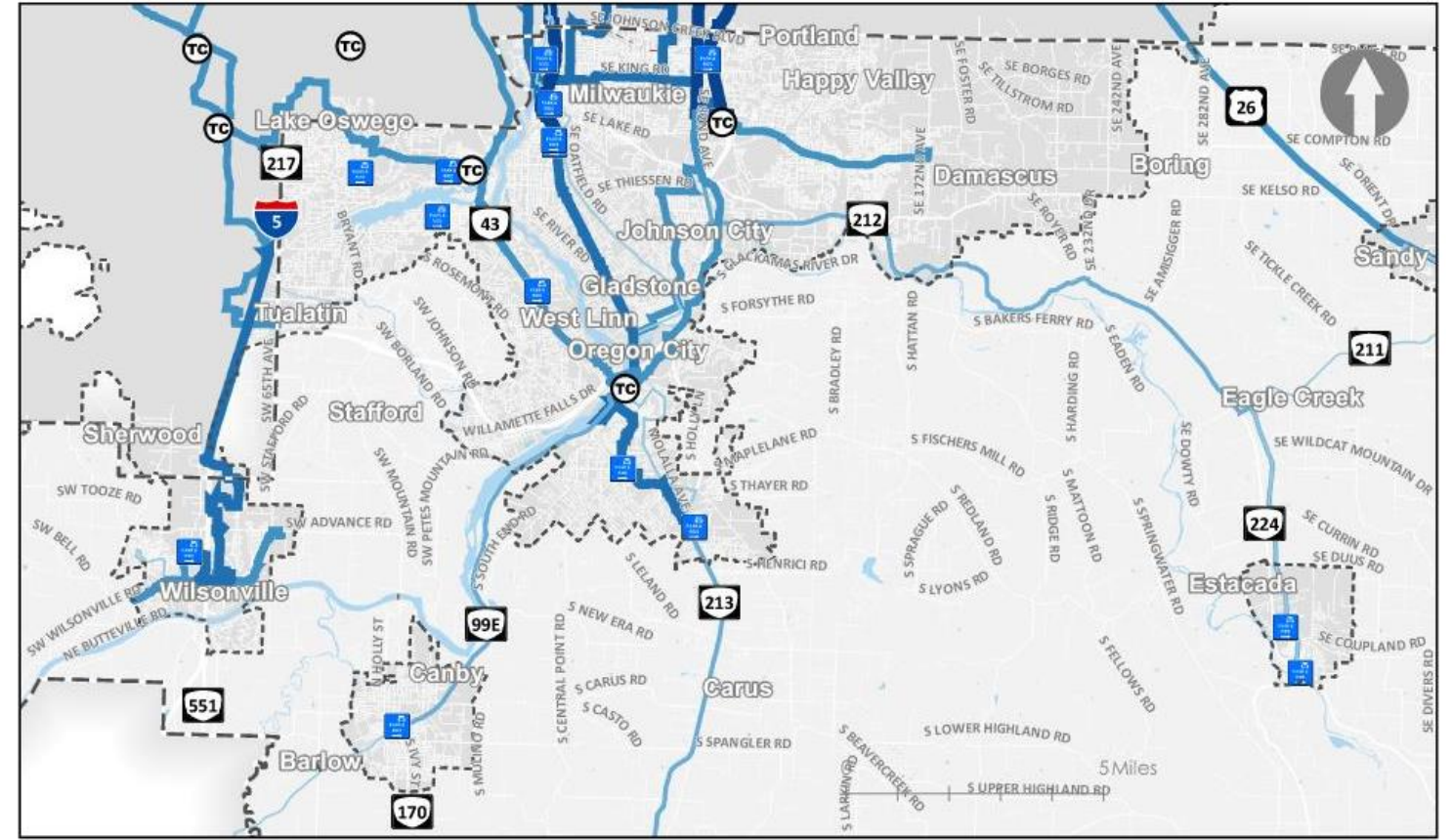
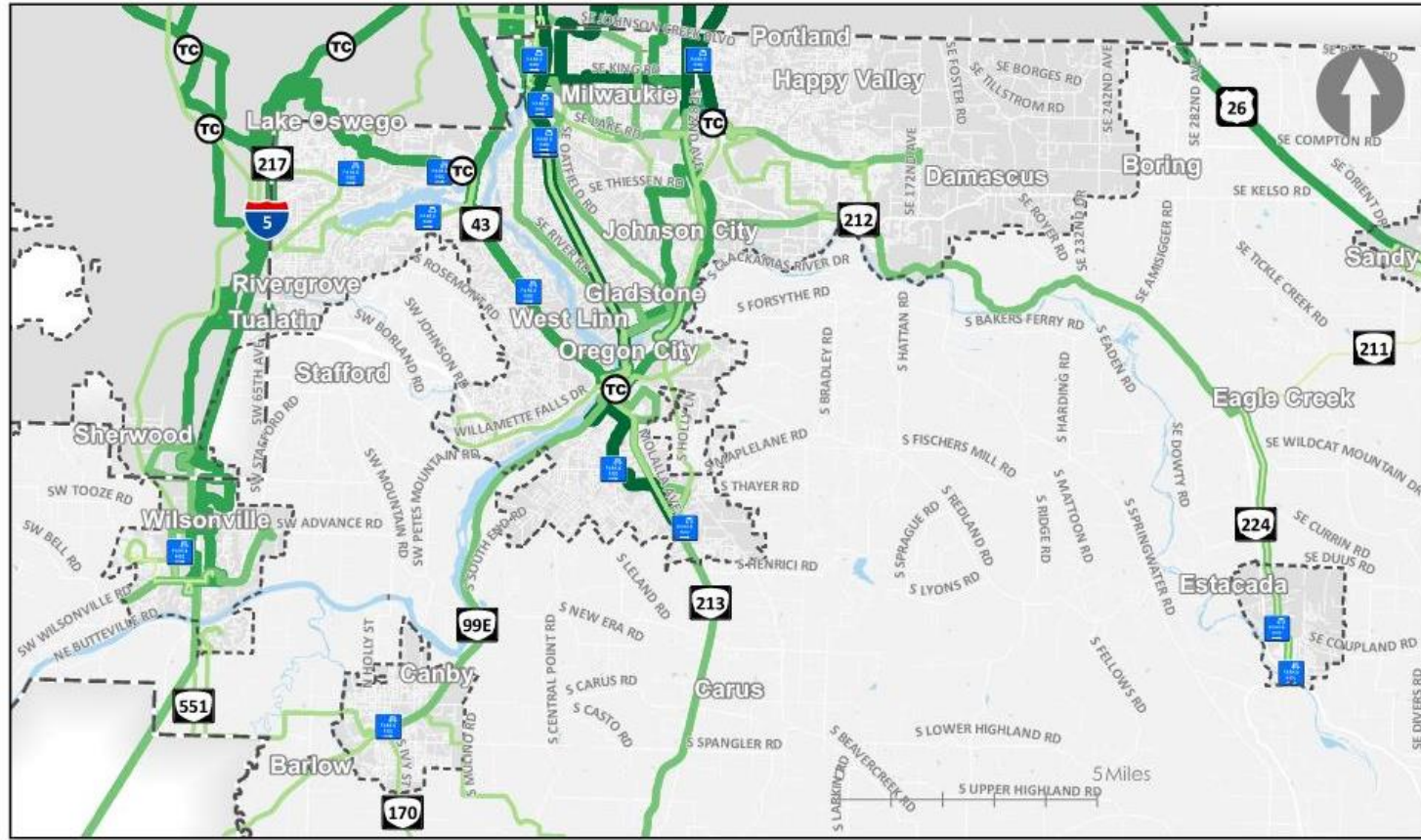


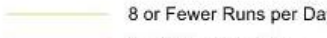
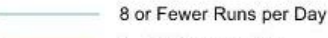
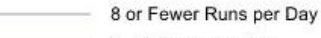

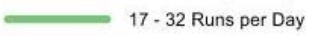
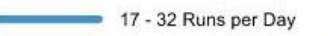
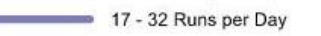

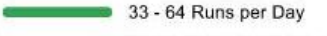
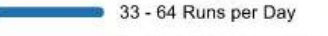
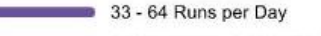
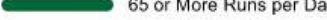
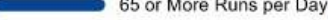
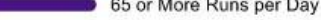





Figure 11: Weekday, Saturday, and Sunday Service Frequency – TriMet Extents



Legend









 Transit Centers	Weekday Transit	Saturday Transit	Sunday Transit
 Park and ride lots	 8 or Fewer Runs per Day	 8 or Fewer Runs per Day	 8 or Fewer Runs per Day
 Urban Growth Boundaries	 9 - 16 Runs per Day	 9 - 16 Runs per Day	 9 - 16 Runs per Day
 County Boundary	 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

Summary of Gaps Identified through Evaluation Criteria

- **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 without Transit Access:** The following areas lack local transit service: Damascus, Boring, Estacada, Eagle Creek, Clackamas Industrial Area. Additionally, 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.
- **Walking and Bicycling Access:** Key areas lacking pedestrian and bicycle access are rural highways lacking formal pedestrian and bicycle facilities, as well as shoulders that can be used as waiting areas and bus pullouts. Focusing improvements on pedestrian and bicycle facilities along highways that have transit service can help improve access to transit in rural areas.
- **Service to Underrepresented Communities:** The following areas with significant or concentrated underrepresented communities also lack existing transit service: Oregon City outskirts, areas around Canby, Eagle Creek, 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, and a lack of 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 a lack of service on several regional corridors, including OR 212 between the Clackamas Industrial Area and Damascus/Boring, Interstate 205 between West Linn and Tualatin/Wilsonville, and on OR 211 between Molalla to Woodburn.
- **Population Served:** Transit-supportive areas without transit include the Clackamas Industrial Area, western West Linn, southern and western Oregon City, Damascus and the C2C Corridor, and southern Canby.
- **Service Span and Frequency:** By headway and service span level of service (LOS), 84% of all transit routes in the county are at LOS D or better for headway and 63% of all transit routes in the county are at LOS D or better for service span. Outside of the TriMet district, there is not much weekend service, especially on Sundays, on intercommunity routes.
- **Service Hours per Capita:** Increases to service span, service frequency, or both can help improve transit service levels to people in rural Clackamas County. Additionally, increased transit service in urban areas can raise Clackamas County service closer to 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. Improvements to ease of fare payment and information such as real-time vehicle arrival can improve the riding experience for existing riders and can also attract new riders. Technology such as automated passenger counters provides useful information for planning and operating service.

Figure 12: Needs Summary – County Extents



-  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

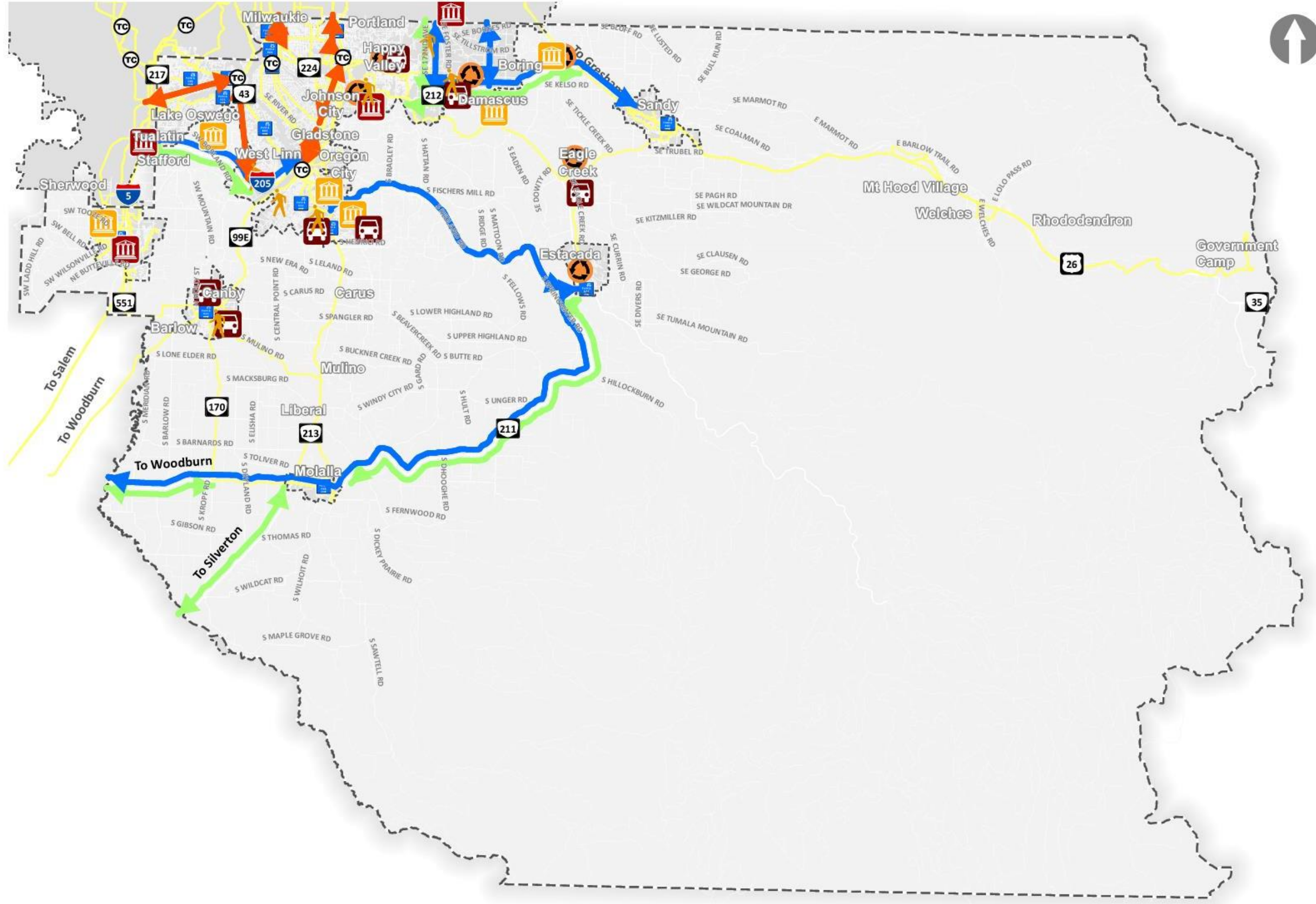
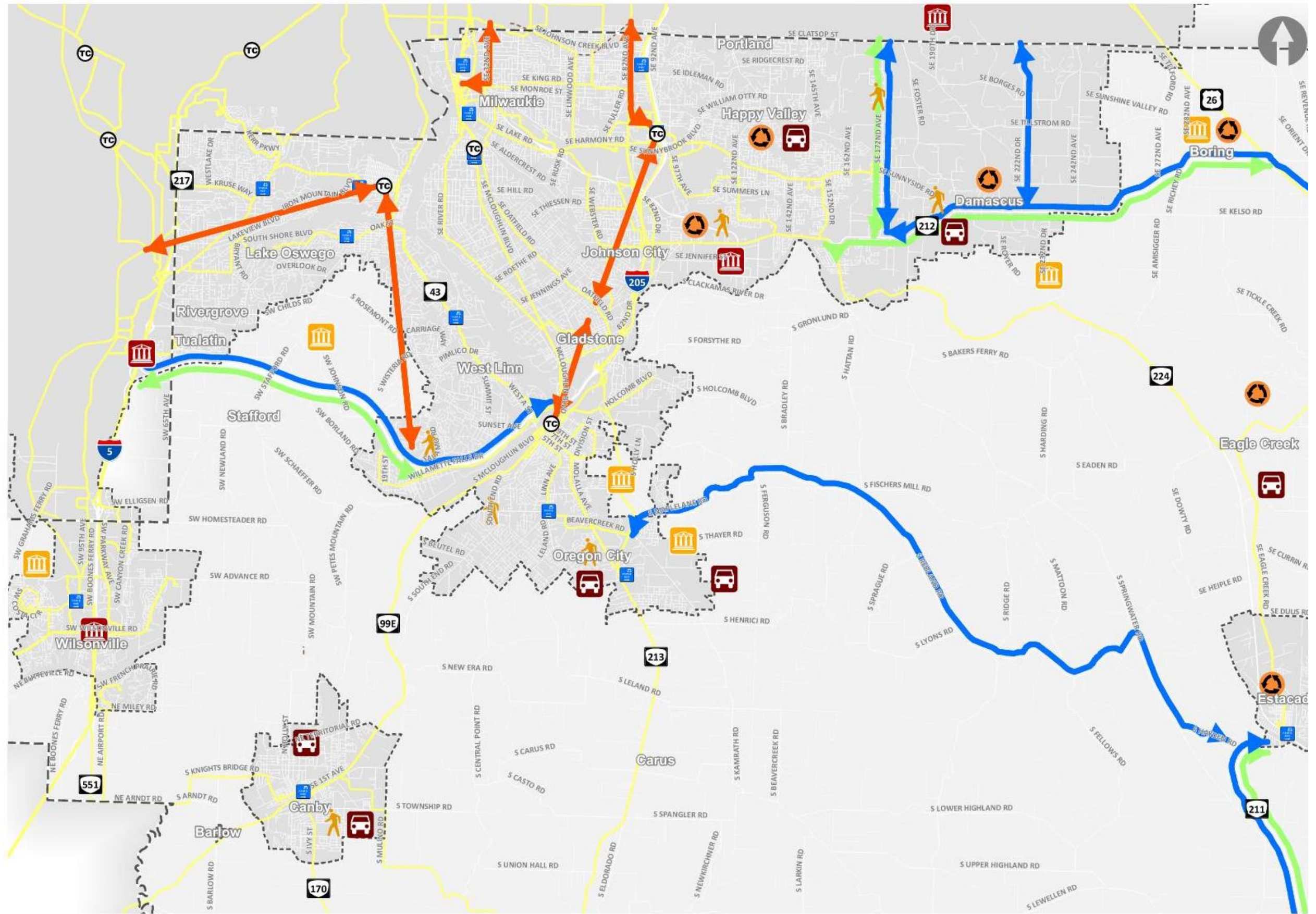


Figure 13: Needs Summary – TriMet Extents



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



Gaps Identified in Previous Regional Plans

TriMet and Metro have regional and localized transit service enhancement plans that identify specific new routes as well as broader transit needs. This section summarizes the needs identified through TriMet's Service Enhancement Plan and Metro's Regional Transit Strategy. Figure 12 And Figure 13 summarize these needs.

TriMet's Service Enhancement Plans

Within the Southeast section of TriMet's Service Enhancement Plan, the following improvements have been outlined for Clackamas County:

- Additional east–west bus service, specifically to connect Happy Valley to Highway 212 and Oregon City
- Use of shuttles to increase access to jobs, specifically to the Milwaukie and Clackamas Industrial Areas, and to education, including Clackamas Community College (shuttle planning has been funded by STIF; Oregon City and Clackamas Industrial shuttle operations will be funded by STIF)
- Improve frequency and extend service to a variety of locations within TriMet's service area
- Specific route improvements include community/jobs connectors in the Clackamas Industrial Area and in southern Oregon City, as well as new routes connecting Clackamas Town Center, Gladstone and Oregon City, and Happy Valley, Gladstone and Oregon City

Within the Southwest section of TriMet's Service Enhancement Plan, the following improvements have been outlined for Clackamas County:

- Additional east-west service between Clackamas County and Washington County, including extended service on TriMet Routes 36 and 37 from Lake Oswego into Washington County and a potential community/jobs service area connection between Oregon City, West Linn, and Tualatin (planning funded by STIF)
- New service between West Linn's Willamette commercial area, West Linn City Hall, and Lake Oswego running west of Highway 43
- The planned Southwest Corridor light rail line that will terminate at Bridgeport Village, just west of the county line

TriMet Public Transportation Improvement Plan

As a STIF provider, TriMet is responsible for distributing state transit funds across the county, including to areas outside TriMet's service district. These planned improvements include:

- Streamlined TriMet bus service and a new bus route connecting Oregon City, Gladstone, and Clackamas Town Center;
- Expanded, enhanced, and new service, along with technological improvements for all other transit providers in the County; and
- Capital improvements, including fleet upgrades, new software, and bus stop amenities for all other transit providers in the County.

Metro's Regional Transit Strategy

Metro's Regional Transit Strategy is a high-level visioning and strategy document for transit across the region. Specific transit projects related to Clackamas County include:

- The Portland to Lake Oswego streetcar as a future high-capacity transit project;
- A bus route from Clackamas Town Center to Happy Valley and Damascus via the C2C Corridor as a future high-capacity transit project; and
- As part of the Enhanced Transit Concept, projects on 82nd Avenue from Clackamas Town Center north and along the Cesar Chavez corridor from Milwaukie Town Center north.

Other Regional Improvement Findings

This section summarizes improvements to regional connections and intercity routes identified through other transit plans.

- SAM's Transit Master Plan identifies future regional service connecting Sandy with Clackamas Town Center along Highway 212, with service to Damascus and Boring.
- SCTD's Transit Development and Master Plan identifies a new route connecting Molalla and Woodburn along Highway 211.
- Canby's Transit Master Plan aims to increase transit frequency on Route 99X, providing service to Oregon City northbound and to Woodburn southbound.
- The Clackamas Community College Shuttle Service and Access Plan identifies focused service to Clackamas Town Center and adding shuttle stops along the existing route.
- The Technical Advisory Committee noted a desired transit connection between Estacada , Redland, and Oregon City as there is no transit today.

Takeaway: *These plans identify additional service connecting Clackamas Town Center, Gladstone, and Oregon City; new and enhanced service between West Linn, Lake Oswego, and Washington County to provide new connections and improve existing service; increased transit service on the Enhanced Transit Concept lines in the county in addition to the needs identified through this project's evaluation criteria, and new connections along Highway 212, Highway 211, and between Oregon City and Estacada.*

Gaps Identified through Outreach

An online open house was open June 4 – July 2 and three listening sessions were held to gather public feedback about transit needs in Clackamas County. Table 4 shows the key findings and potential needs or solutions to address this feedback. As shown, most feedback relates to geographic connections or non-route improvements such as marketing, information and technology, and other system ease of use factors. *The full public outreach summary is included in Appendix B.*

Table 4. Outreach Findings

Key Finding	Potential Needs
<p>Within the past year, 54% of all respondents used TriMet, 40% used no transit service, and small percentages of respondents used the smaller service providers.</p> <p>Prior to the survey, nearly all of the non-riders had heard of TriMet and about 30% of the respondents had heard of Canby Area Transit (CAT), Sandy Area Metro (SAM), South Metro Area Regional Transit (SMART), and Mt Hood Express. Fewer people had heard of South Clackamas Transit District (SCTD) and the CCC Xpress Shuttle.</p>	<p>Increase and improve advertising and marketing of services; coordinate with community partners to educate the public about services.</p>
<p>About 60% of non-riders prefer to drive and 39% stated that transit doesn't go where they need it to go. Twelve of the non-riders do not support transit in general and do not want to pay tax dollars for it (Question 34 opened-ended responses.)</p>	<p>Increase connections to underserved areas.</p>
<p>14 write-in comments in response to why people don't use transit noted safety concerns as a primary reason people do not ride transit, and in subsequent open-ended questions, safety concerns were a prominent theme.</p>	<p>Improve bus stop amenities, including illumination and shelters, and improve pedestrian and bicycle connections to transit.</p>
<p>9 non-riders said that their disability makes traveling via transit more difficult.</p>	<p>Consider increased demand-response services and improved first/last-mile connections to transit.</p>
<p>129 non-riders (near 50% of non-riders) use Uber/Lyft or a taxi service to get around.</p>	<p>Implement app-based transit technologies, including real-time vehicle arrival information and mobile payments, to make transit a competitive alternative to similar services.</p>
<p>Of the riders, about 90% use MAX/light-rail, whereas 62% ride a bus with a fixed route. Only 10 people use TriMet Lift or a similar door-to-door service.</p>	<p>Seek opportunities to implement dedicated facilities for transit, such as MAX extensions, bus lanes, or bus-on-shoulder operations. Dedicated right-of-way improves transit reliability and increases transit competitiveness.</p>
<p>The primary destination for participants was for recreational/social purposes but high numbers of people also commute to work and shopping destinations via transit.</p>	<p>Recreational/social destinations often included locations such as the Moda Center or downtown Portland where parking may be more expensive or limited and congestion may impact travel time. Seek means of improving transit travel time, such as dedicated facilities; implement park-and-rides and pedestrian/bicycle connections to transit, especially for routes along congested or high-demand corridors; and encourage transit-supportive policies such as higher parking pricing in high-demand areas.</p>
<p>The most common specific place that people would like to travel to by transit if it were available was West Linn (Question 10).</p>	<p>Increase connections to West Linn.</p>
<p>50% of participants travel directly to their destinations and do not transfer.</p>	<p>Seek fare reciprocity between transit providers to make transfers easier for riders.</p>

Key Finding	Potential Needs
Fewer riders transfer between different service providers, but 74% transfer between TriMet lines.	
Responses by non-riders to where specifically they would like to travel if it was available, listed by cross streets, yielded: Salamo Road, Stafford Road, Beaver Creek Road, Borland Road, Sunnyside Road, Lower Boones Ferry Road, and Highway 43 from L.O. to Portland. (Question 15)	Improve connections to and along these corridors.
The desire for MAX to run to Oregon City came up in several different open-ended comments for various questions.	Improve connections to Oregon City.
In both the survey and listening sessions, respondents indicated a need for more park-and-ride facilities, especially along rural highways	Identify opportunities for informal and formal park-and-rides throughout the County.

Needs Identification

Potential needs were primarily identified through evaluation criteria assessments, considerations of gaps identified in previous regional plans, and gaps identified through public involvement and outreach described in the prior sections. Potential needs have been grouped by service improvement options to address those needs and to include new transit corridors, refinements to existing routes, and service enhancements and efficiencies.

New Corridors

Potential needs for new transit corridors were identified primarily through the intercommunity connections, communities with transit access, service for underrepresented communities, access to jobs, service on regional corridors, and population served evaluation criteria as well as other regional planning efforts and public outreach and feedback. As shown in Table 5, nearly all of these needs were identified based on more than one evaluation criterion. 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 5 also identifies the primary transit district, or notes N/A where a corridor extends between multiple transit districts.

Additionally, these needs will need to address the type of transit service best suited to meet the need. Many can be accomplished through traditional fixed-route local or intercity services. However, many of the needs have markets, like commuters/employment and lower-density communities, that may better benefit from services like commuter shuttles, last-mile shuttles, or vanpools.

Some of these areas represent new coverage areas but the needs could be met by extending or modifying existing routes. Potential extensions are considered in the *Refinements to Existing Routes* section, below.

Table 5. 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 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	Clackamas Town Center, Gladstone, and Oregon City			X				X	X
	TriMet	West Linn, Lake Oswego, and Washington County							X	X
	TriMet	Enhanced Transit Corridors on Cesar Chavez and 82 nd Avenue			X				X	
	TriMet*	Damascus, Happy Valley, and Gresham on the future C2C Corridor	X			X	X	X	X	
New Local Service	TriMet*	Damascus		X	X	X				
	TriMet*	Boring		X		X				
	TriMet	Estacada and Eagle Creek		X	X					
	TriMet	Clackamas Industrial Area		X		X		X	X	
	TriMet	Jennings Lodge and Oak Grove		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				

*Added to transit district in future.

Refinements to Existing Routes

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

- Extension of the Mt. Hood Express from Sandy along Highway 212, connecting Damascus, Boring, and the Clackamas Industrial Area to Clackamas Town Center.
- Extension of TriMet Route 87 along the future C2C Corridor on SE 172nd Avenue and SE 190th Avenue connecting Damascus, Happy Valley, and Gresham.
- Extension of TriMet Routes 155 or 156 connecting to Damascus via Sunnyside Road and more of Happy Valley to the north of existing service.
- Modifications to TriMet Routes 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 scheduled to be implemented September 2020.**
- Generally, route modifications can provide additional connections to/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 [9608 SE Fuller Rd, Happy Valley], Maple Apartments [14338 S. Maple Lane Ct, Oregon City], and Good Shepard Village [12596 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 areas as system integration, fares, timetables, transportation planning efforts, and trip planning applications/software.
- Increasing schedule reliability and efficiency through coordination efforts between transit providers
- Making transit easier to ride 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 to this area can make for a safer, more comfortable first or last mile to the Sandy-Estacada Route and TriMet Route 30 Estacada.
- Improving bus stops with signage, benches, illumination, and/or shelters
- Working with local agencies to identify potential developer-funded transit sites (e.g., bus stops and related amenities such as sidewalks), especially those serving residential development, 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.

Next Steps

The memorandum was reviewed with the Technical Advisory Committee (TAC) and Public Advisory Committee (PAC) and will be used to inform the Transit Development Plan. These needs will serve as the basis in the development of future service enhancements, which will be evaluated and prioritized.

Appendix

- A. TCQSM Level of Service Procedures
- B. Public Outreach Summary

Appendix A. TCQSM Level of Service Procedures

TCQSM Level of Service Procedures

Chapter 3 of the TCQSM provides an extended discussion on quality of service, which is the evaluation of transit service from the passenger's point-of-view. The TCQSM uses six measures to quantify service quality. Each of these measures is assigned a letter value, where LOS A represents the best service from the passenger perspective and LOS F represents the worst service. *(Note that high LOS values, such as LOS A or B, may not reflect optimal service from the transit agency's perspective, because the market may not support those service levels. The development of agency service standards helps to bridge the gap between the kind of service passengers would ideally want and the kind of service that is reasonable to provide, given available resources.)* The transit LOS approach mirrors the system commonly used for streets and highways and allows a speedy comparison of service performance to transit passenger desires.

Of the six available measures, three were selected for this analysis as being most relevant to a long-range planning effort. Table B-1 summarizes the TCQSM measures used and the ranges of values used to determine the LOS result for each measure.

Table A-1. Transit Capacity and Quality of Service Manual – Level of Service Measures

Level of Service	Transit Capacity and Quality of Service Measures		
	Service Frequency (minutes)	Hours of Service	Service Coverage
LOS A	<10	19-24	90.0-100.0%
LOS B	10-14	17-18	80.0-89.9%
LOS C	15-20	14-16	70.0-79.9%
LOS D	21-30	12-13	60.0-69.9%
LOS E	31-60	4-11	50.0-59.9%
LOS F	>60	0-3	<50.0%

Service Frequency

From the user's perspective, *service frequency* determines how many times an hour a user has access to transit service, assuming that service is provided within acceptable walking distance (measured by *service coverage*) and at the times the user wishes to travel (measured by *hours of service*). Service frequency also measures the convenience of transit service to choice riders and is one component of overall transit trip time (helping to determine the wait time at a stop). Table B-2 describes the level of service thresholds for service frequency.

Table A-2. Service Frequency – Level of Service Thresholds

Level of Service	Description of Service Frequency
LOS A	Passengers are assured that a transit vehicle will arrive soon after they arrive at a stop. The delay experienced if a vehicle is missed is low.
LOS B	Service is still relatively frequent, but passengers will consult schedules to minimize their wait time at the transit stop.
LOS C	Service frequencies still provide a reasonable choice of travel times, but the wait involved if a bus is missed becomes long.
LOS D	Service is only available about twice per hour and requires passengers to adjust their routines to fit the transit service provided.
LOS E	Service is provided approximately once per hour and puts passengers in the position of potentially spending long periods of time waiting for service and/or rearranging schedules to be able to take transit.
LOS F	Service is provided frequencies greater than 1 hour, which entails creative planning or considerable wasted time on the part of passengers.

Hours of Service

Hours of service, also known as *service span*, is the number of hours during the day when transit service is provided along a route, a segment of a route, or between two locations. It plays as important a role as *frequency* and *service coverage* in determining the availability of transit service to potential users: if transit service is not provided at the time of day a potential passenger needs to take a trip, it does not matter where or how often transit service is provided the rest of the day. Table B-3 describes the level of service thresholds for hours of service.

Table A-3. Hours of Service – Level of Service Thresholds

Level of Service	Description of Hours of Service
LOS A	Service is available for most or all of the day. Workers who do not work traditional 8-to-5 jobs receive service and all riders are assured that they will not be stranded until the next morning if a late-evening bus is missed.
LOS B	Service is available late into the evening, which allows a range of trip purposes other than commute trips to be served.
LOS C	Bus service runs only into the early evening, but still provides some flexibility in one's choice of time for the trip home.
LOS D	Service meets the needs of commuters who do not have to stay late and still provides service during the middle of the day for others.
LOS E	Midday service is limited or non-existent and/or commuters have a limited choice of travel times.
LOS F	Transit service is offered only a few hours per day or not at all.

Service Coverage

Service coverage is a measure of the area within walking distance of transit service. Areas must be within 1/4-mile of a bus stop (or service route if there are no designated stops) or 1/2 mile of a transit station to be considered an area served by transit. As with the other availability measures, service coverage does not provide a complete picture of transit availability by itself, but when combined with frequency and hours of service, it helps identify the number of opportunities people have to access transit from different locations. Service coverage LOS evaluates the percentage of transit-supportive areas—areas that would typically produce the majority of a system's ridership—that are served by transit.

To qualify as a transit-supportive area (TSA) one of the following thresholds must be met:

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

Service coverage is an all-or-nothing issue for transit riders—either service is available for a particular trip or it is not. As a result, there is no direct correlation between service coverage LOS and what a passenger would experience for a given trip. Rather, service coverage LOS reflects the number of potential trip origins and destinations available to potential passengers. As noted in Table B-1, at LOS A, 90 percent or more of the TSA's have transit service; at LOS F, less than half of the TSA's have service.

While transit service coverage area includes everything within a 1/4 mile of scheduled service, paratransit service coverage is typically provided up to 3/4 of a mile of scheduled service.

Appendix B. Public Outreach Summary