Section 5
Southwest County

OVERVIEW OF KEY FINDINGS – SOUTHWEST COUNTY

Existing and 2035 future conditions analysis was conducted for the transportation system in the Southwest County. Key findings from this analysis are summarized below. The full analysis of the existing conditions and future base conditions follows.

Existing Conditions:

Transportation Disadvantaged Populations

- The areas with a high percentage of transportation disadvantaged populations are relatively spread out throughout the geographic area and in low density areas; however there are many areas of transportation disadvantaged populations in the more densely populated incorporated areas of Canby and Oregon City.

Roadways

- Three of the 24 study intersections in Southwest County, listed below, do not meet performance standards. All 21 other study intersections are operating within the volume-to-capacity ratio or level of service standards.
    - Clackamas River Drive/Springwater Road
    - S. Leland Drive/OR 213
    - OR 99E/ S. Barlow Road
- Roadway segments outside of the Urban Growth Boundary (UGB) are primarily uncongested during the weekday evening peak hour.

Sidewalks/Pedestrian Walkways

- Based on rural roadway standards, there are no deficiencies in the pedestrian system except in the Rural Centers of Colton, Redland, and Beavercreek.
- Sidewalks are a required standard on all roadways in the County's urban areas; however the Essential Pedestrian Network in the County's comprehensive plan (see Appendix 5) provides guidance on which local roadways are critical parts of the pedestrian network. It also includes all collectors and arterials in the subarea.
- Existing gaps in the pedestrian network include all roadways identified on the Essential Pedestrian Network that do not have an existing sidewalk facility.
- The County's Pedestrian Master Plan identifies priorities for filling in the pedestrian network gaps which will be reviewed using the TSP Vision and Goals evaluation criteria.

Bicycle Lanes

- There are shoulder lanes on portions of the state highway system including parts of OR 213 and OR 99E. The county roadway system has shoulder bikeways on Redland Road to Hattan Road only.

- The County's Bike Master Plan identifies priorities for filling in the bicycle network gaps. The priority of these projects will be reviewed based on the TSP Vision and Goals evaluation criteria.
- Existing gaps in the network include all roadways identified on the Planned Bicycle Network (nearly all collectors and arterials) that do not have an existing bicycle facility.

Safety Corridors

- The following candidate safety corridors (listed in no particular order) were identified based on the crash data review and analysis:
    - S Redland Road from OR 213 to S Hattan Road
    - OR 213 from Molalla Avenue to S Spangler Road
    - OR 213 from S Graves Road to OR 211
    - S Maple Lane Road from Beavercreek Road to Ferguson Road
    - S Beavercreek Road from S Lower Highland Road to S Butte Road
    - S Upper Highland Road from S Beavercreek Road to S Lower Highland Road
    - OR 211 from S Beavercreek Road to S Upper Highland Road
    - OR 99E from S Sequoia Parkway to S Lone Elder Road
    - OR 99E from NE Territorial Road to the Urban Growth Boundary
    - OR 170 from OR 99E to S Macksburg Road
    - OR 213/S Beavercreek Road Intersection
    - Redland Road/S Springwater Road Intersection

Transit

- Transit service consists of fixed-route bus service and dial-a-ride service.
- Service Frequency: A majority of the services provided currently operate at LOS D or below throughout the day with respect to frequency. TriMet Lines 33 and 99, however, operate at LOS C during peak time periods.
- Hours of Service: A majority of the services provided currently operate at LOS D or below throughout the day with respect to hours of service.
- Transit Service Coverage: The current population and employment service coverage is LOS E. Some of the transit supportive areas which are not currently served by transit may require additional transit routes or additional transportation facilities.
    - The number of transit supportive areas is expected to increase significantly within the Oregon City area by 2035. While a small part of this area is expected to be served by existing transit services, the remaining areas will require additional service routes or connections to existing routes in order to be served.

2035 Future Base Conditions:

- Ten of the 24 study intersections were found to operate at volume-to-capacity ratios in excess of performance standards under both the low build and full build future conditions:
    - Clackamas River Drive/Springwater Road
    - S. Redland Road/S. Holly Lane
    - S. Redland Road /S. Ferguson Road
    - S. Beavercreek Road /S. Maple Lane Road
    - S. Henrici Road /OR 213
    - South End Road/OR 99E
    - S. Leland Road /OR 213
    - OR 99E/S. Barlow Road
    - S. Spangler Road /OR 213
    - S. Union Mills Road/S. Beavercreek Road
- One intersection was found to operate at volume-to-capacity ratios in excess of performance standards under the low build scenario, but meets performance standards under the full build future conditions:
    - NE Miley Road/NE Airport Road
- Of the 11 study intersections that did not meet performance standards under Low Build, nine are modified by a Full Build Project (e.g., a turn lane or other physical change made to the intersection). However, they continue to not meet standards under the Full Build Scenario.
    - Clackamas River Drive/Springwater Road
    - S. Redland Road/S. Holly Lane
    - S. Redland Road /S. Ferguson Road
    - S. Beavercreek Road /S. Maple Lane Road
    - S. Henrici Road /OR 213
    - South End Road/OR 99E
    - NE Miley Road/NE Airport Road
    - S. Spangler Road /OR 213
    - S. Union Mills Road/S. Beavercreek Road
- Demand for travel is highest along OR 213, OR 99E, S Beavercreek Road, S Redland Road, S Springwater Road, OR 170, and S Union Hill Road under both the low build and full build future conditions.

- Congestion is highest on the following roadway segments under both the low build and full build future conditions:
  - OR 213 (within and surrounding Oregon City)
  - Arndt Road (NE Airport Road to S Barlow Road)
  - S Barlow Road (S Arndt Road to OR 99E)
  - S South End Road (within Oregon City)
- Overall, moderate growth is forecast for the study roadways.

EXISTING CONDITIONS – SOUTHWEST COUNTY

INTRODUCTION

The Southwest County geographic area extends south and west from the Willamette River to the County boundary. The majority of the area is located outside the County's urban growth boundary (UGB), with the exception of Oregon City. The area includes portions of OR 99E, OR 170, OR 211, and OR 213. The incorporated communities of Oregon City, Canby, and Molalla are located in Southwest County, as well as the unincorporated areas of Beavercreek, Mulino and Colton. The extent of the Southwest County is illustrated in Figure S 1.

LAND USE AND POPULATION

This section provides a general overview of existing land uses and population patterns. It identifies the activity centers in the area, reviews current land uses and zoning designations, assesses population density, and identifies transportation disadvantaged populations.

Activity Centers

Southwest County includes the incorporated areas of Oregon City, Molalla, and Canby as well as the unincorporated communities including Beavercreek, Mulino, and Colton. The County's TSP update focuses on the communities, activities, and transportation system within and surrounding the unincorporated areas of the County. Figure S 2 illustrates the location of these communities as well as the activity centers within and surrounding the communities such as libraries, parks, and schools.

- Beavercreek, home to approximately 6,500 people, is located south of Oregon City.
- Mulino is located north of Molalla and south of Beavercreek. The Hamlet of Mulino in coordination with Clackamas County developed the Mulino Community Plan and Design Handbook, which is available on its website: http://www.hamletofmulino.us/index.html.
- Colton is located northeast of Molalla along OR 211. The community has its own school district consisting of Colton Elementary, Colton Middle, and Colton High School.

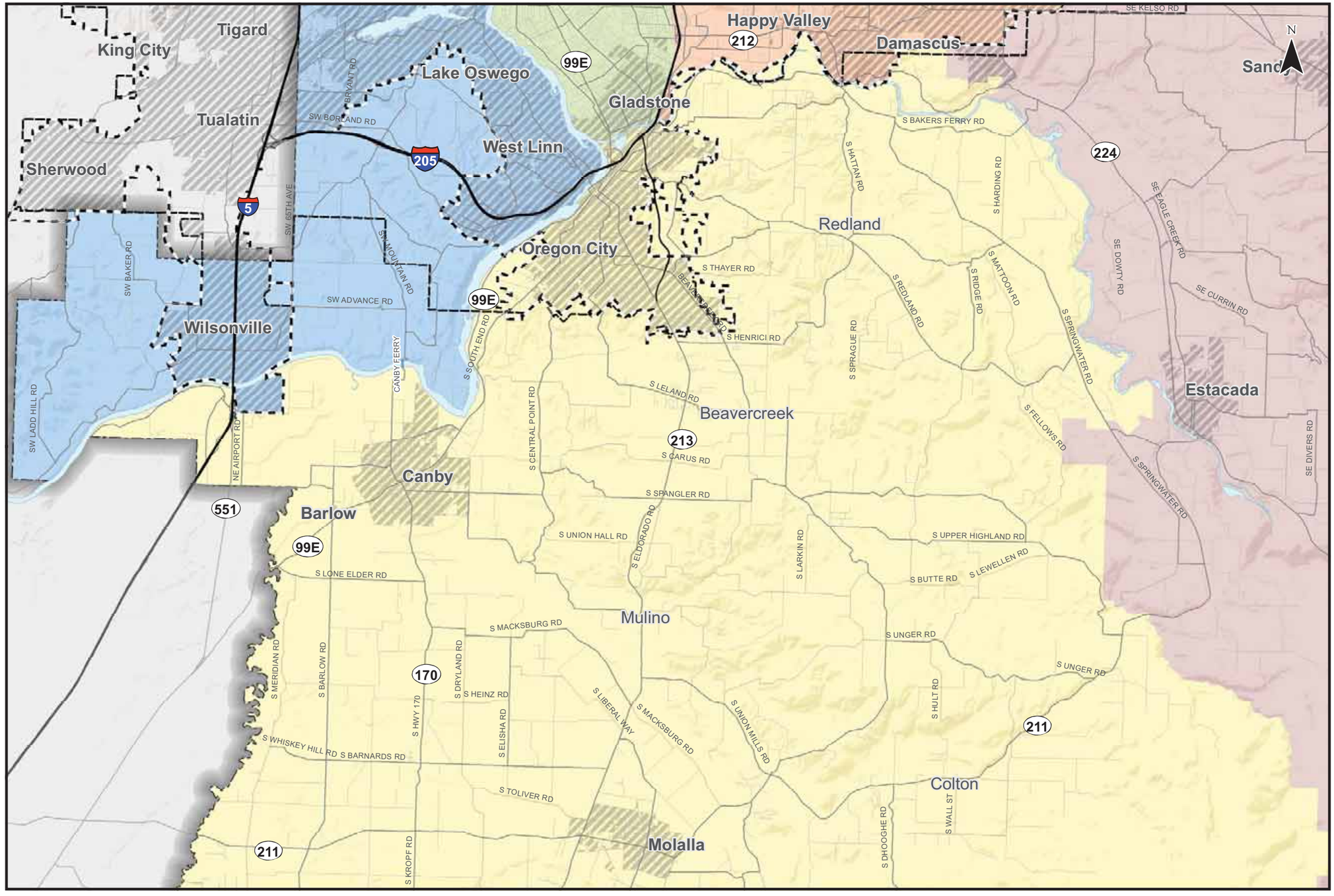
The incorporated areas within the County, while not a specific focus of the County's TSP update, do have a number of activity centers that attract local residents and visitors.

- The area around Molalla provides opportunities for fishing in the Molalla River, hunting, hiking, farming, and rural residential development. Molalla also has a golf course that attracts local traffic and visitors.
- Oregon City is located at the "End of the Oregon Trail" and features several museums, historic homes and buildings that are popular tourist stops.

CLACKAMAS COUNTY TRANSPORTATION SYSTEM PLAN Update

Geographic Analysis Sub Areas

- East County
- Southwest County
- Greater McLoughlin Area
- Greater Clackamas Regional Center/ Industrial Area
- Northwest County
- Incorporated Areas
- County Boundary
- UGB
- Metro Area



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Coordinate System:
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Data Source:
Clackamas County, Metro Data Resouce Center

Southwest County - Northern Portion
Geographic Analysis Sub Areas

Figure
SN 1

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CLACKAMAS COUNTY TRANSPORTATION SYSTEM PLAN Update

Geographic Analysis Sub Areas

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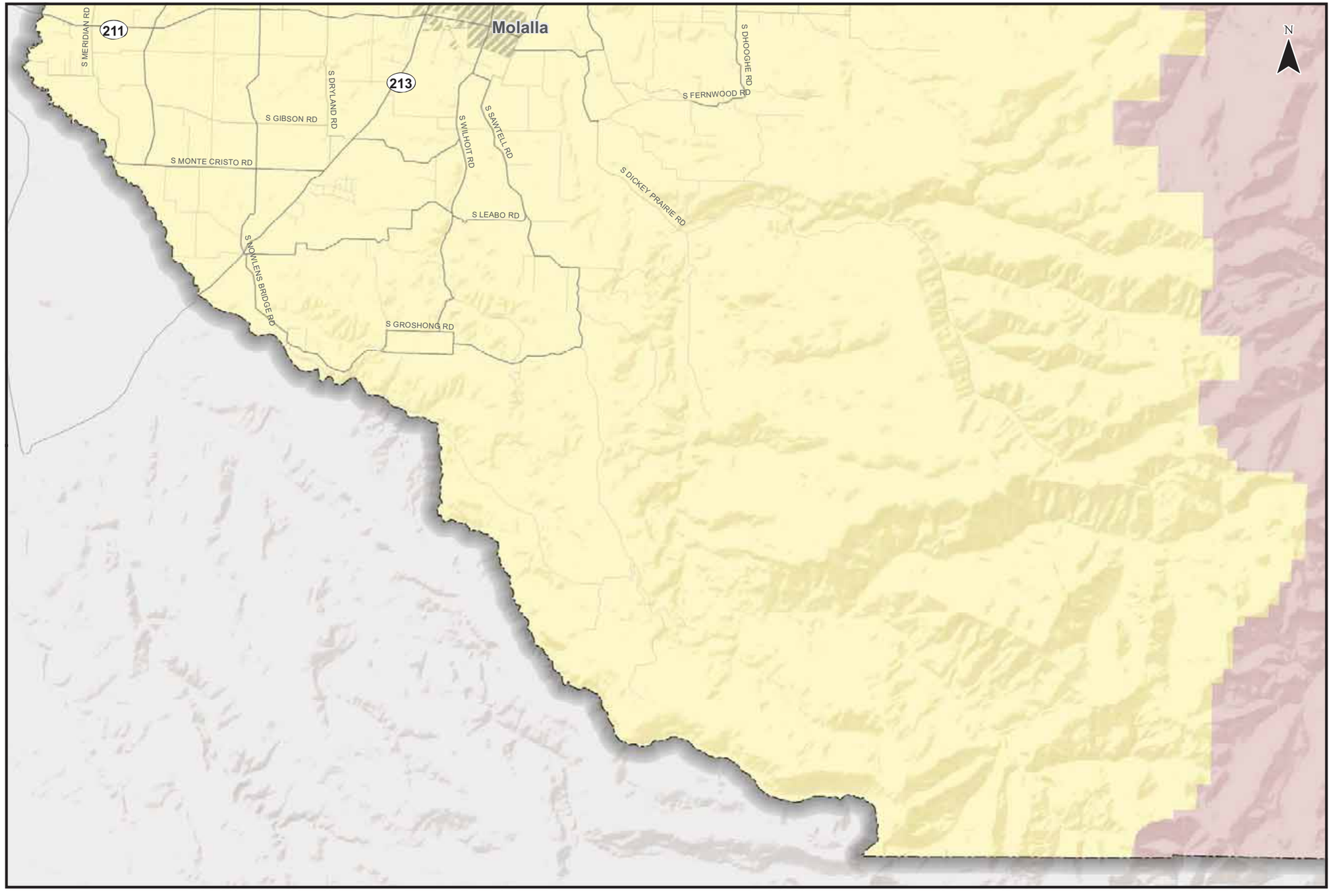

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Data Source:
Clackamas County, Metro Data Resouce Center

Southwest County - Southern Portion Geographic Analysis Sub Areas

Figure
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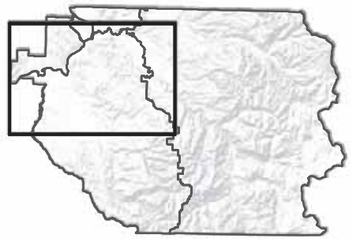
CLACKAMAS COUNTY TRANSPORTATION SYSTEM PLAN Update



- Fire Stations
- Museum
- City Hall
- Libraries
- Park & Ride
- Light Rail

Schools

- Public Elementary
- Public Middle School
- Public High School
- Private K-12
- College or University

- Parks
- State Parks
- Mt. Hood National Forest
- Urban Activity Centers
- Incorporated Areas
- Rural Centers
- County Boundary
- UGB

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Coordinate System:
NAD 1983 HARN StatePlane Oregon North FIPS 3601 Feet Intl
Data Source:
Clackamas County, Metro Data Resouce Center

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Activity Centers
Southwest County - Northern Portion

Figure
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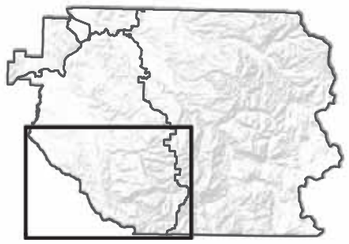
CLACKAMAS COUNTY Transportation System Plan Update



- Fire Stations
- Museum
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- Light Rail

Schools

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Clackamas County, Metro Data Resouce Center

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Activity Centers
Southwest County - Southern Portion

Figure
SS 2

- The area around Canby contains some of the richest farmland in Oregon and local nurseries produce a wide variety of plants. Canby also has the largest served industrial area in Clackamas County and supports several large employers. Canby is also home to the Clackamas County Fairgrounds where the County Fair is held every August, and the Canby Ferry, one of only three remaining ferries that cross the Willamette River.
- Oregon City, Canby, and Molalla each have several schools, government buildings, and park/ride locations.

The location of the activity centers noted above, as well as concentrations of commercial, employment, and residential uses, will be considered when making recommendations for enhancing the transportation system for multiple users.

Land Use and Zoning

Figure S 3 illustrates the current basic land use zoning designations throughout Southwest County. Each land use's purpose, area of application, uses, and regulations are described in the *Clackamas County Zoning and Development Ordinance.* As seen in the figure, the majority of the southwestern portion of the county is zoned "Timber District," intended to conserve and protect environmental resources and recreational opportunities. Other significant portions are zoned for Exclusive Farm Use or as Rural Residential. Canby and Molalla both have large areas zoned for industrial development.

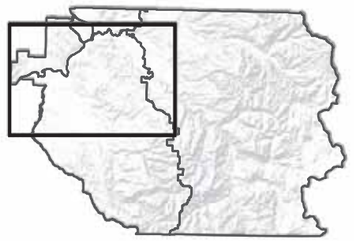
Population Inventory

Figure S 4 illustrates the population density by census tract. From this figure,, it is evident that the highest population density is in the incorporated areas of Oregon City, Canby, and Molalla. The population density is low (0-2 people per acre) in the rest of the area.

Figures S 5 through S 8 illustrate demographic information about the households within Southwest County. Respectively, these figures show the elderly (age 65 and older) population, youth (age 17 and younger) population, low-income population, and vehicle ownership. The data within each of these figures were combined and used to identify the transportation disadvantaged populations.

Figure S 9 illustrates the location of transportation disadvantaged populations, which are populations who have historically had significant unmet transportation needs or who have experienced disproportionate negative impacts from the transportation system. Transportation disadvantaged populations were mapped by census block and calculated by considering the location of elderly populations, youth populations , low-income populations earning less than 200% of the poverty line, non-white and non-Hispanic populations, households with 0-1 vehicles, households where no adult speaks English well, and residential areas within 500 feet of a freeway or highway. The majority of Southwest County is categorized as "Least Disadvantaged" or "Somewhat Disadvantaged." There are large areas within Canby, Oregon City, and Molalla of "Disadvantaged" and "Most Disadvantaged" populations. The areas along state highways are also mostly categorized as "Disadvantaged" and "Most Disadvantaged." The purpose of mapping this information is to be aware of where the population is living while considering their needs to access different destinations. Population density and the location of disadvantaged populations will both be considered when identifying transportation projects to include in the TSP Update.

CLACKAMAS COUNTY TRANSPORTATION SYSTEM PLAN Update



Zoning Designations

- Exclusive Farm Use
- Ag. / Forest District
- Timber District
- Rural Center
- Rural Residential, Future Urban
- Urban Low Density Residential
- Village Residential
- Medium Density Residential
- High Density Residential
- Commercial
- Industrial
- Planned Mixed Use
- Village Community Service
- Open Space Management

- Urban Reserves
- Rural Centers
- Incorporated Areas
- County Boundary
- UGB

0 1 2 3 4 Miles

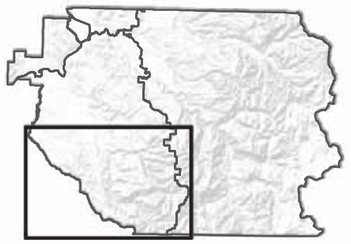
Coordinate System:
NAD 1983 HARN StatePlane Oregon North FIPS 3601 Feet Intl
Data Source:
Clackamas County, Metro Data Resouce Center

H:\proj\file\11732 - Clackamas County TSP\gis\11x17 Maps\03 Land Use Zoning Designations.mxd

Land Use Zoning Designations
Southwest County - Northern Portion

Figure
SN 3

CLACKAMAS COUNTY TRANSPORTATION SYSTEM PLAN Update



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- Ag. / Forest District
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- Rural Center
- Rural Residential, Future Urban
- Urban Low Density Residential
- Village Residential
- Medium Density Residential
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Data Source:
Clackamas County, Metro Data Resouce Center

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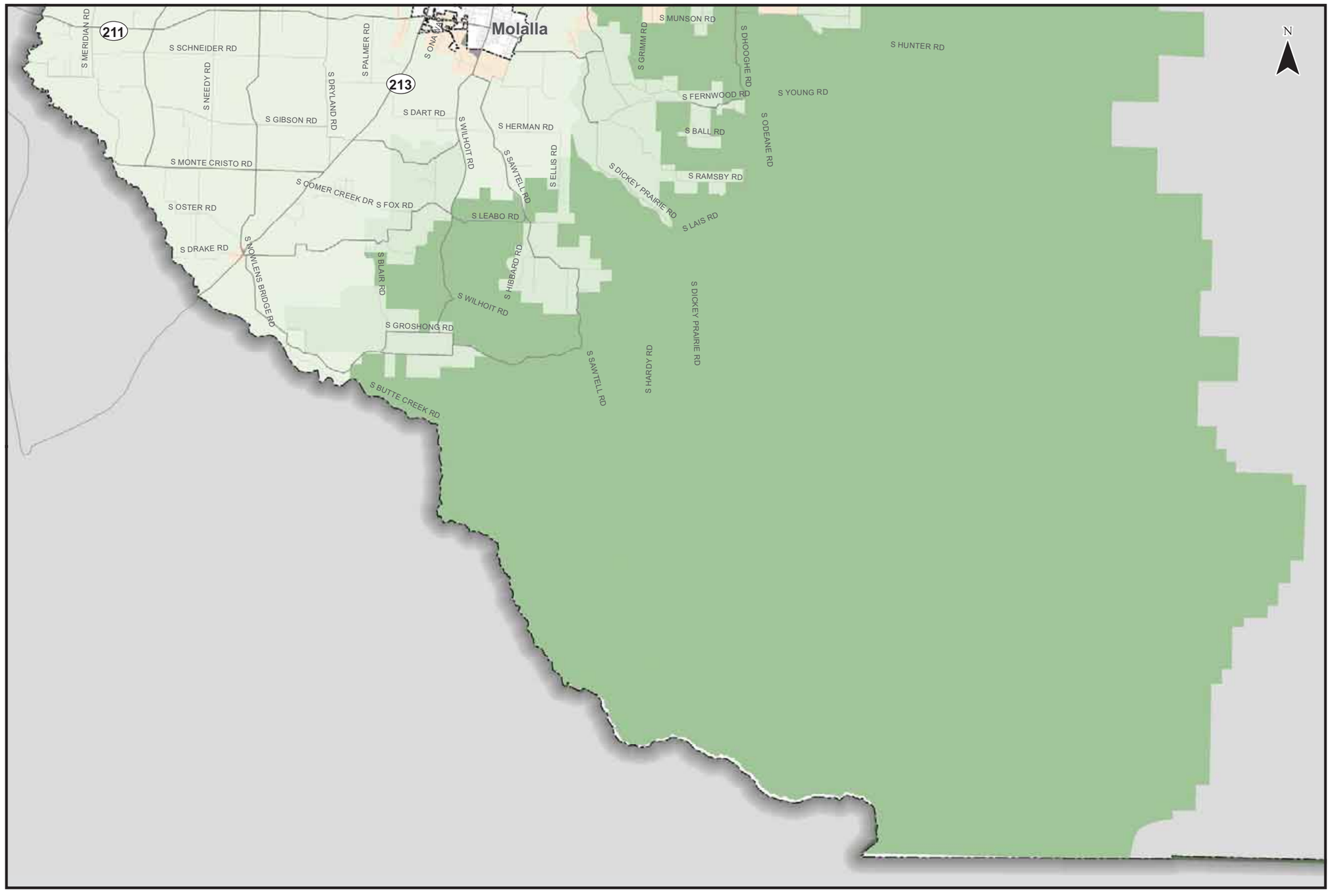
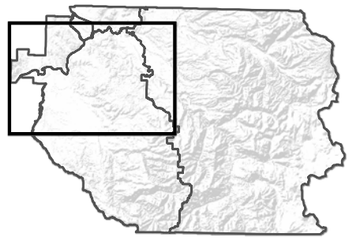


Land Use Zoning Designations
Southwest County - Southern Portion

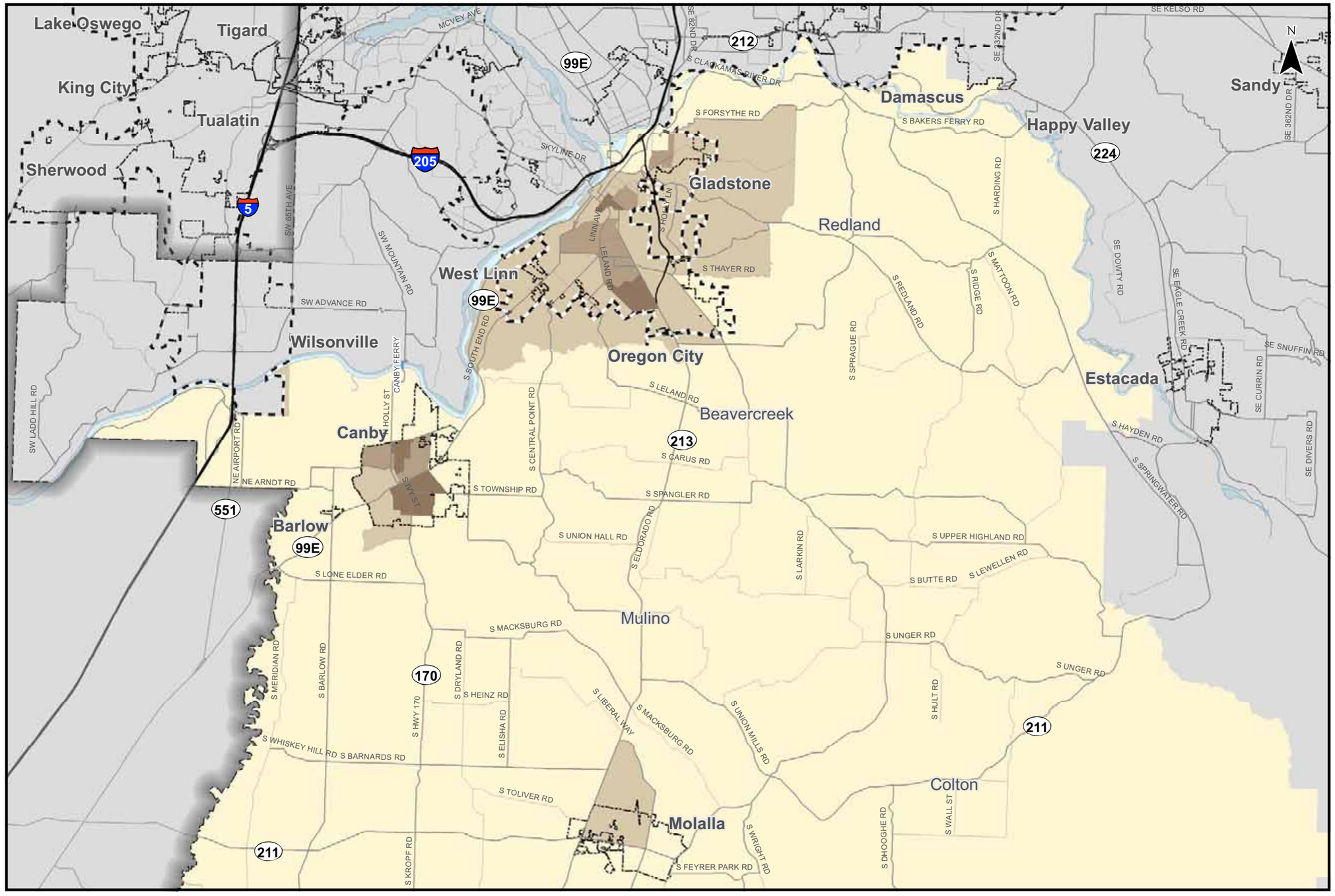
Figure
SS 3

CLACKAMAS COUNTY TRANSPORTATION SYSTEM PLAN Update



People Per Acre

- <1
- 1 - 5
- 6 - 8
- 9 - 12
- 13 - 17
- Incorporated Areas
- County Boundary
- UGB



0 1 2 3 4 Miles

Coordinate System:
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Data Source:
Clackamas County, Metro Data Resouce Center

Population Density by Census Tract
Southwest County - Northern Portion

Figure
SN 4

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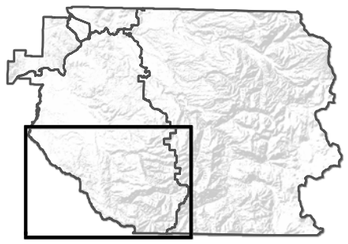
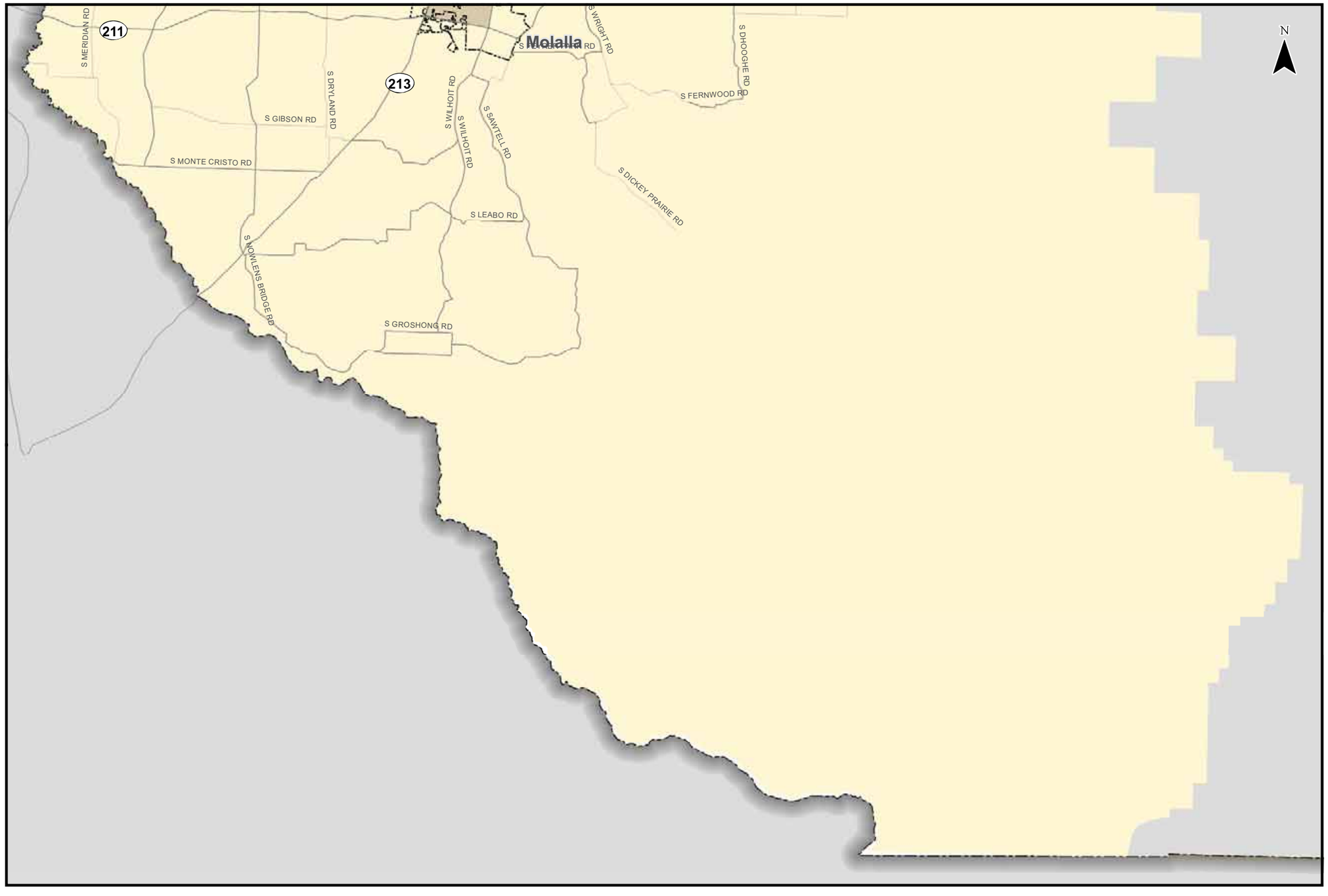
CLACKAMAS COUNTY Update
TRANSPORTATION SYSTEM PLAN





People Per Acre

- <1
- 1 - 5
- 6 - 8
- 9 - 12
- 13 - 17

- Incorporated Areas
- County Boundary
- UGB

0 1 2 3 4 Miles

Coordinate System:
NAD 1983 HARN StatePlane Oregon North FIPS 3601 Feet Intl
Data Source:
Clackamas County, Metro Data Resouce Center

Population Density by Census Tract
Southwest County - Southern Portion

Figure
SS 4

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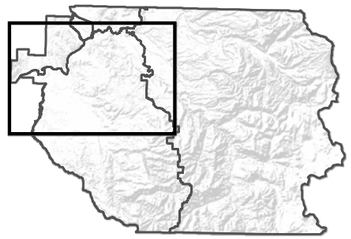
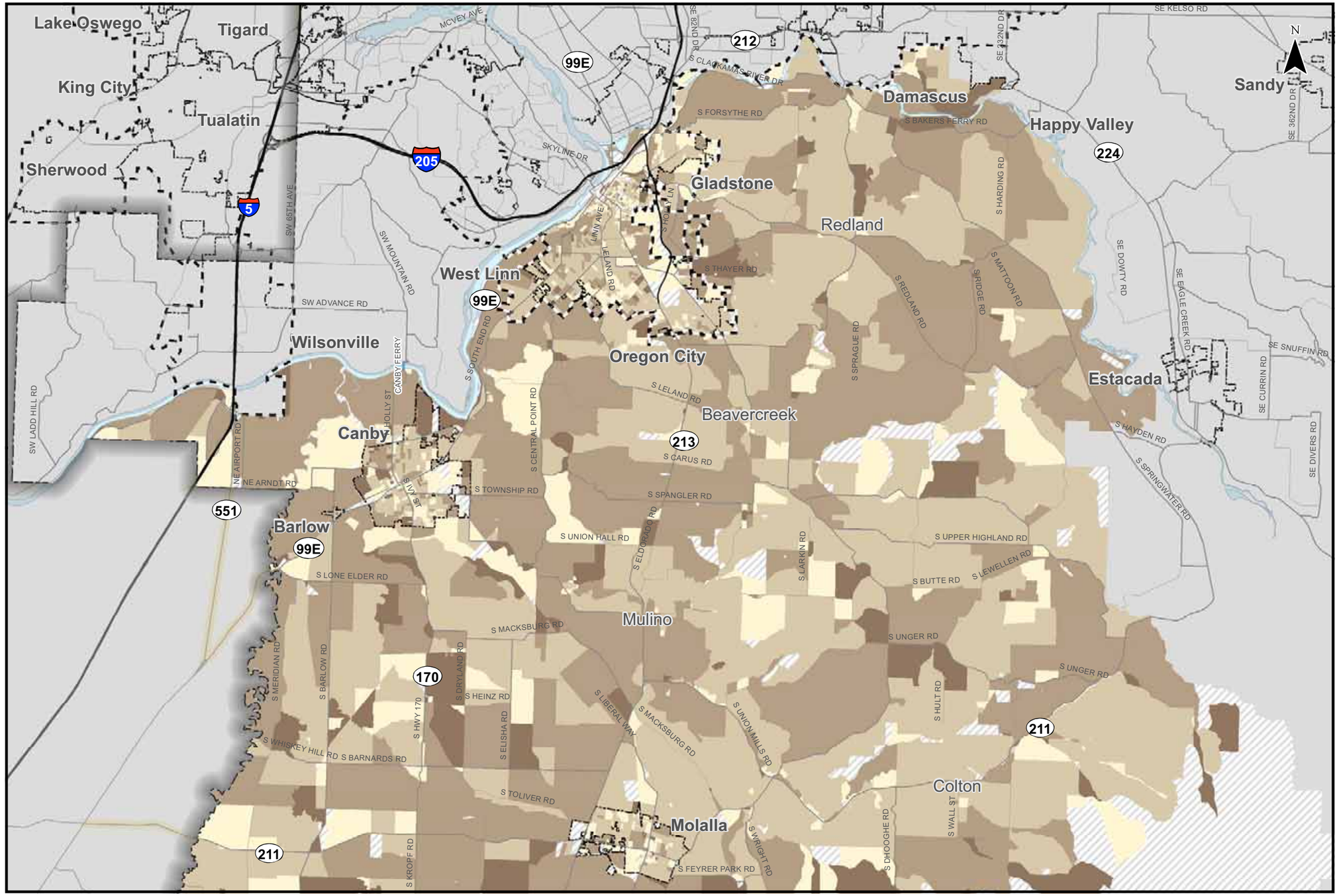
CLACKAMAS COUNTY TRANSPORTATION SYSTEM PLAN Update



Population Age 65 and Older

- 0% - 6%
- 6% - 15%
- 15% - 30%
- 30% - 100%
- No Data

- Incorporated Areas
- County Boundary
- UGB



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Data Source: US Census Bureau (2010 SF1, 5-year ACS estimates, Tiger/Line Shapefiles) Map and analysis by Liz Paterson, April 2012, Oregon Public Health Institute Clackamas County, Metro Data Resouce Center

Elderly Population by Census Block
Southwest County - Northern Portion

Figure
SN 5

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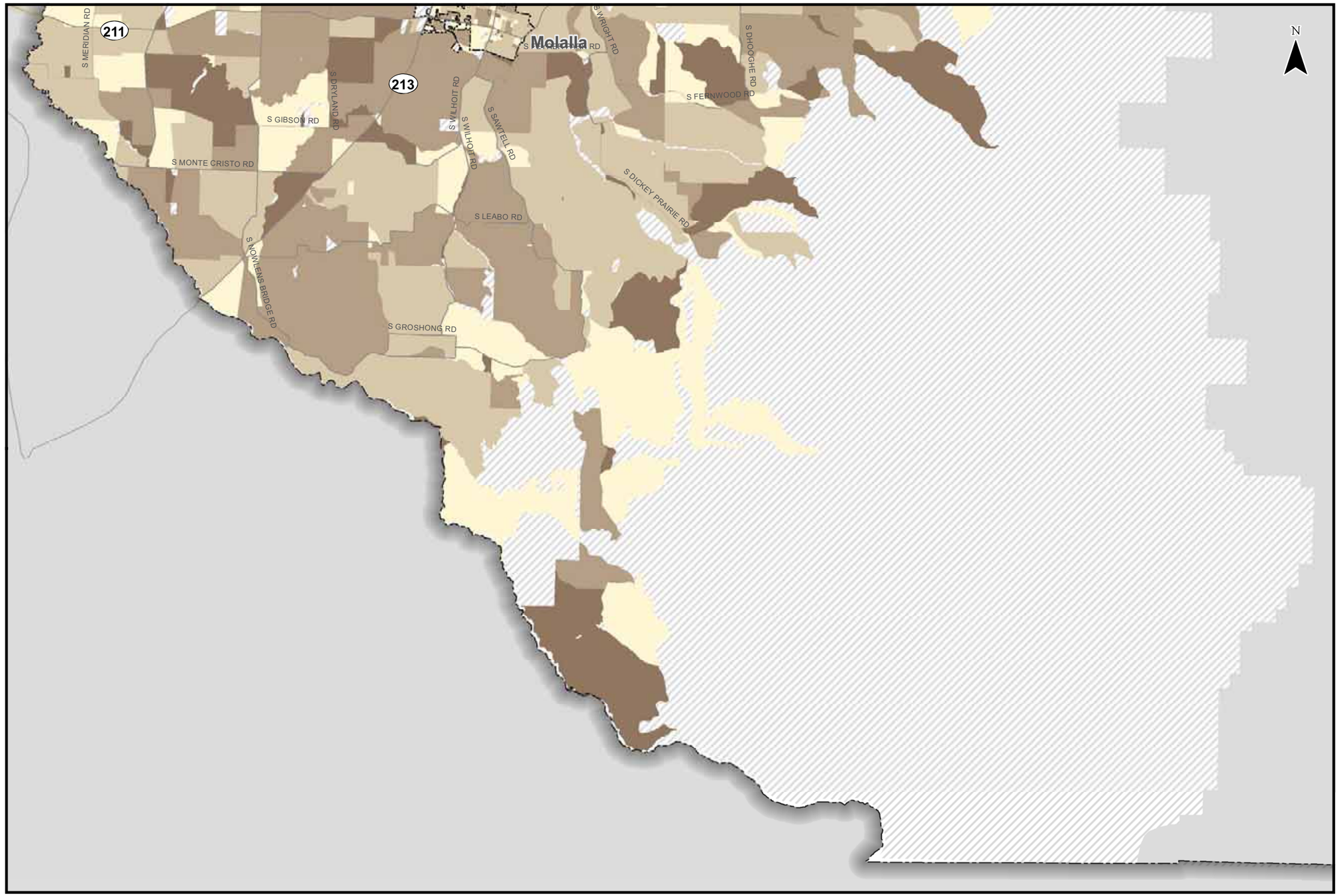
CLACKAMAS COUNTY TRANSPORTATION SYSTEM PLAN Update



Population Age 65 and Older

- 0% - 6%
- 6% - 15%
- 15% - 30%
- 30% - 100%
- No Data
- Incorporated Areas
- County Boundary
- UGB

0 1 2 3 4 Miles

Coordinate System:
NAD 1983 HARN StatePlane Oregon North FIPS 3601 Feet Intl

Data Source: US Census Bureau (2010 SF1, 5-year ACS estimates, Tiger/Line Shapefiles) Map and analysis by Liz Paterson, April 2012, Oregon Public Health Institute Clackamas County, Metro Data Resouce Center

Elderly Population by Census Block
Southwest County - Southern Portion

Figure
SS 5

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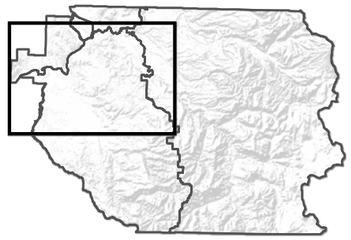
CLACKAMAS COUNTY TRANSPORTATION SYSTEM PLAN Update



Population Under Age 18

- 0% - 10%
- 10% - 25%
- 25% - 33%
- 33% - 100%
- No Data

- Incorporated Areas
- County Boundary
- UGB

0 1 2 3 4 Miles

Coordinate System:
NAD 1983 HARN StatePlane Oregon North FIPS 3601 Feet Intl

Data Source: US Census Bureau (2010 SF1, 5-year ACS estimates, Tiger/Line Shapefiles) Map and analysis by Liz Paterson, April 2012, Oregon Public Health Institute Clackamas County, Metro Data Resouce Center

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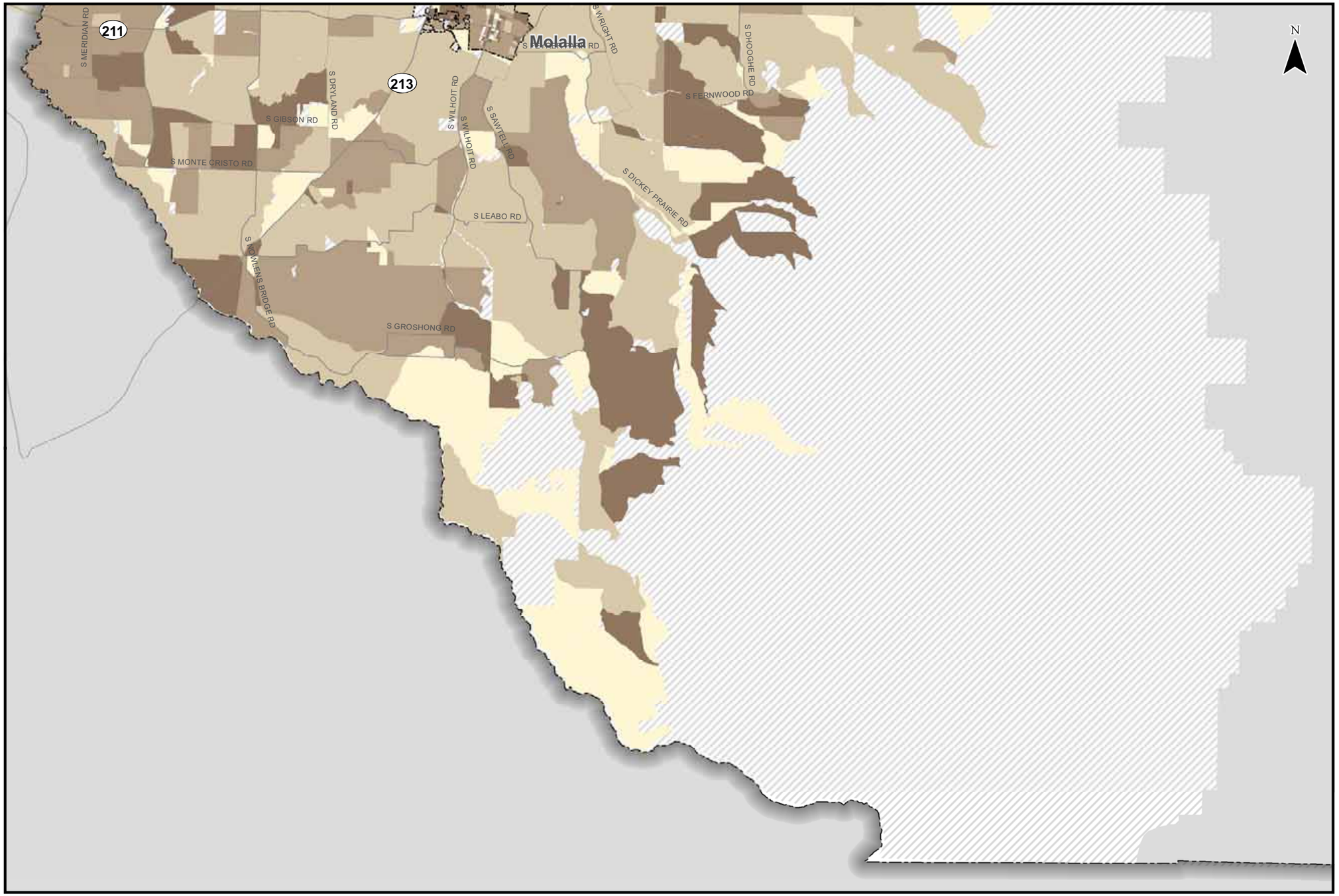
Youth Population by Census Block
Southwest County - Northern Portion

Figure
SN 6

CLACKAMAS COUNTY TRANSPORTATION SYSTEM PLAN Update



Population Under Age 18

- 0% - 10%
- 10% - 25%
- 25% - 33%
- 33% - 100%
- No Data
- Incorporated Areas
- County Boundary
- UGB

0 1 2 3 4 Miles

Coordinate System:
NAD 1983 HARN StatePlane Oregon North FIPS 3601 Feet Intl

Data Source: US Census Bureau (2010 SF1, 5-year ACS estimates, Tiger/Line Shapefiles) Map and analysis by Liz Paterson, April 2012, Oregon Public Health Institute Clackamas County, Metro Data Resouce Center

Youth Population by Census Block
Southwest County - Southern Portion

Figure
SS 6

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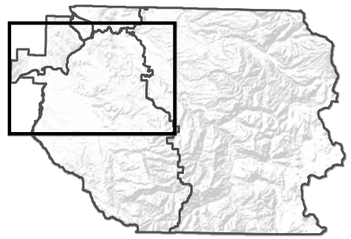
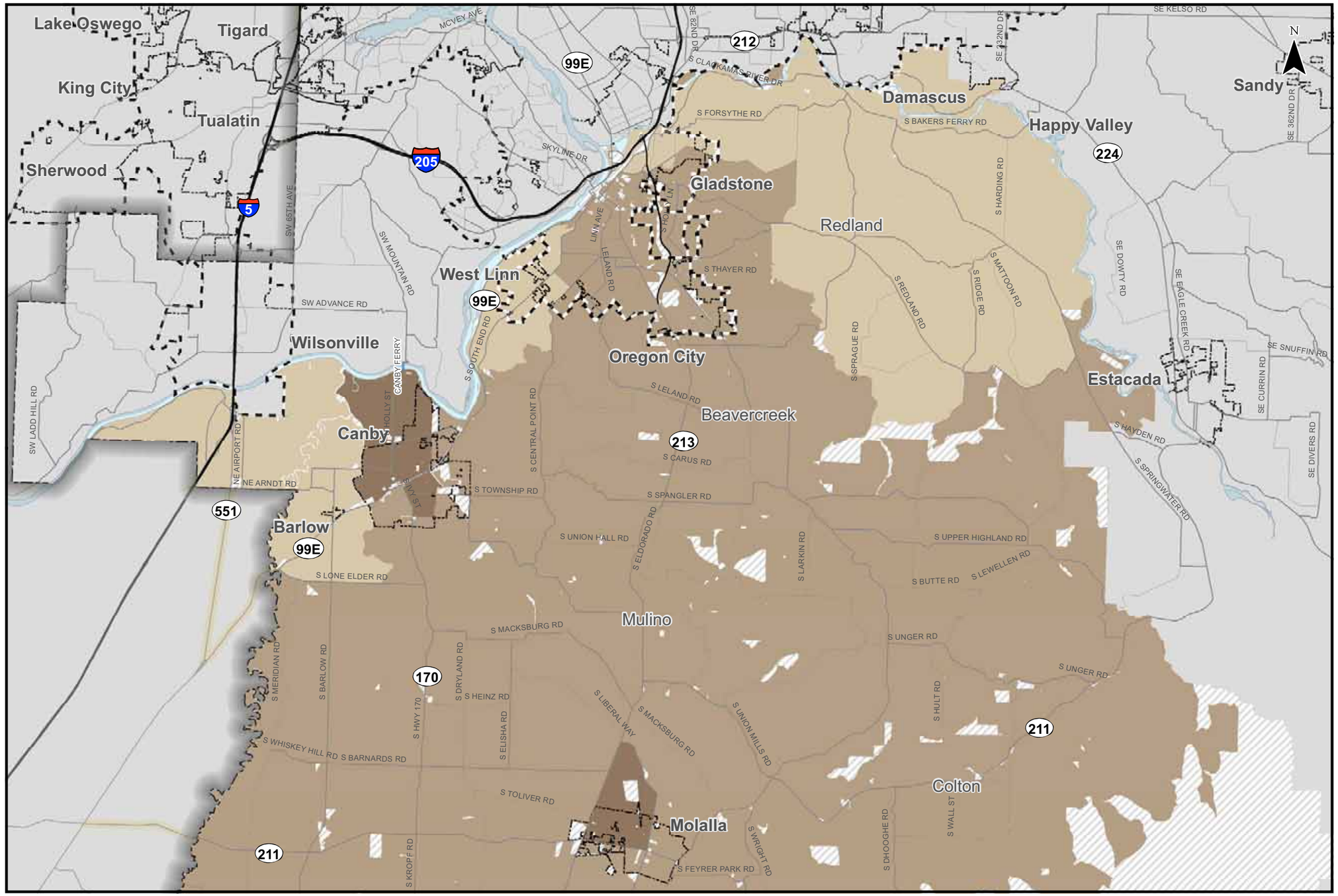
CLACKAMAS COUNTY TRANSPORTATION SYSTEM PLAN Update





Population Under 200% Poverty

- 0% - 10%
- 10% - 20%
- 20% - 33%
- 33% - 100%
- No Data
- Incorporated Areas
- County Boundary
- UGB

0 1 2 3 4 Miles

Coordinate System:
NAD 1983 HARN StatePlane Oregon North FIPS 3601 Feet Intl

Data Source: US Census Bureau (2010 SF1, 5-year ACS estimates, Tiger/Line Shapefiles) Map and analysis by Liz Paterson, April 2012, Oregon Public Health Institute Clackamas County, Metro Data Resouce Center

Low Income Population by Census Block
Southwest County - Northern Portion

Figure
SN 7

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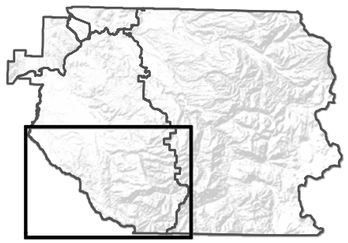
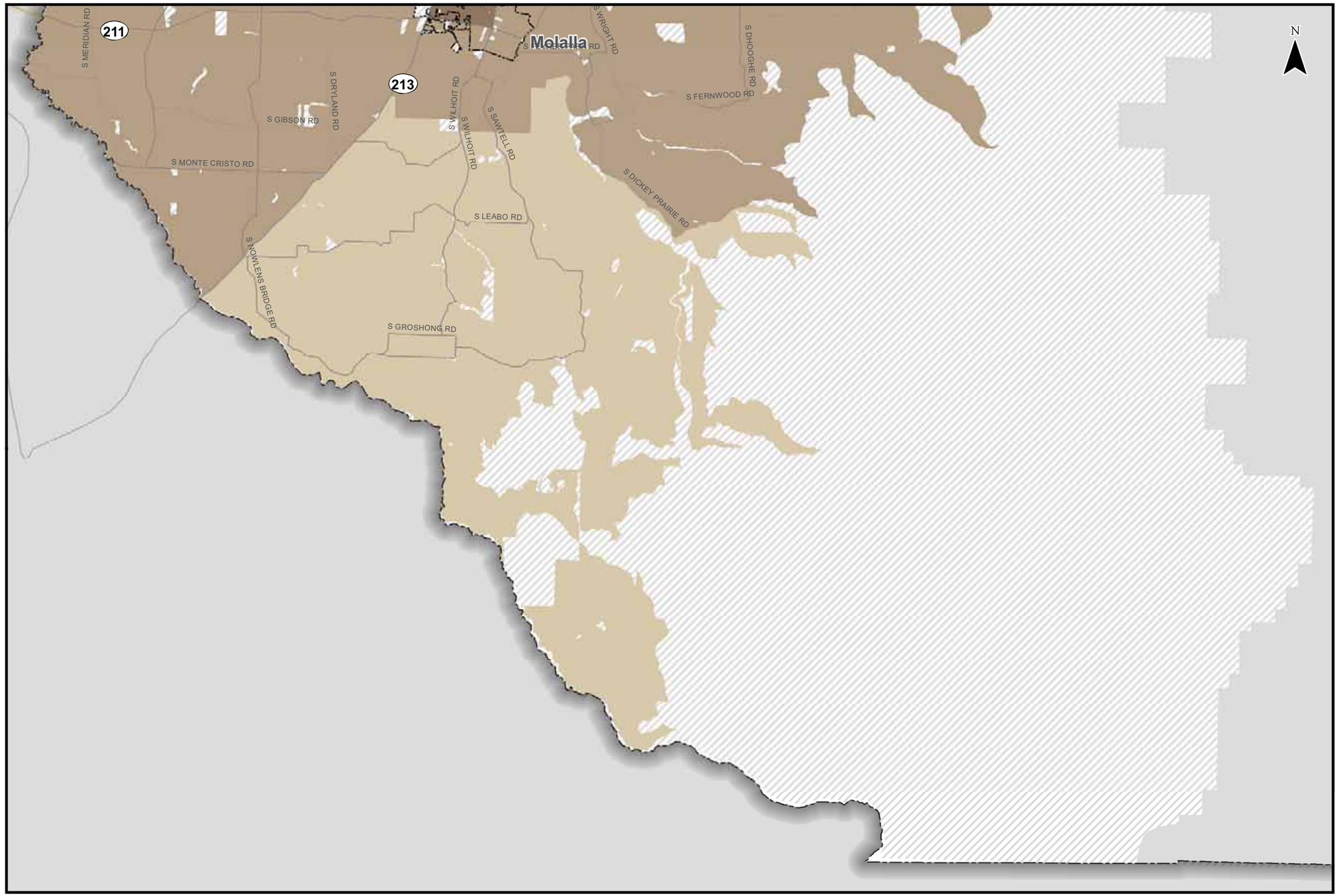
CLACKAMAS COUNTY Transportation System Plan Update



Population Under 200% Poverty

- 0% - 10%
- 10% - 20%
- 20% - 33%
- 33% - 100%
- No Data
- Incorporated Areas
- County Boundary
- UGB



0 1 2 3 4 Miles

Coordinate System:
NAD 1983 HARN StatePlane Oregon North FIPS 3601 Feet Intl

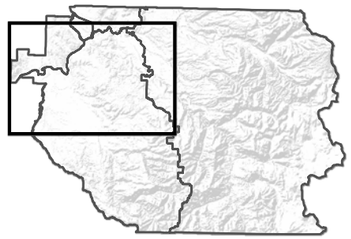
Data Source: US Census Bureau (2010 SF1, 5-year ACS estimates. Tiger/Line Shapefiles) Map and analysis by Liz Paterson, April 2012, Oregon Public Health Institute Clackamas County, Metro Data Resouce Center

Low Income Population by Census Block
Southwest County - Southern Portion

Figure
SS 7

H:\profile\171732 - Clackamas County TSP\gis\11x17 Maps\07 Low Income Population by Census Block.mxd

CLACKAMAS COUNTY TRANSPORTATION SYSTEM PLAN Update



Households with Less Than Two Vehicles

- 0% - 10%
- 10% - 15%
- 15% - 25%
- 25% - 100%
- No Population/No Data
- Incorporated Areas
- County Boundary
- UGB

0 1 2 3 4 Miles

Coordinate System:
NAD 1983 HARN StatePlane Oregon North FIPS 3601 Feet Intl

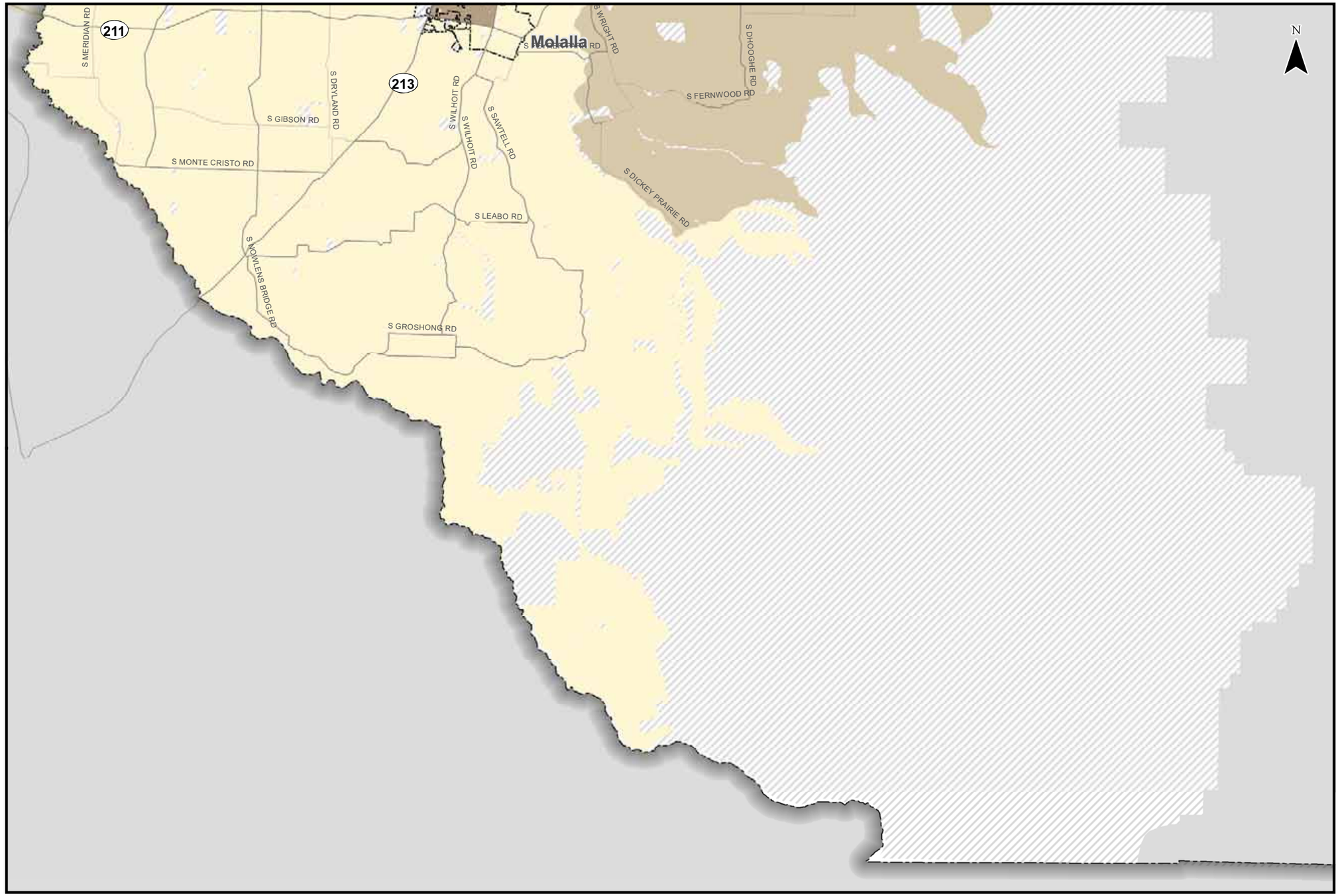
Data Source: US Census Bureau (2010 SF1, 5-year ACS estimates, Tiger/Line Shapefiles) Map and analysis by Liz Paterson, April 2012, Oregon Public Health Institute Clackamas County, Metro Data Resouce Center

H:\proj\file\11732 - Clackamas County TSP\gis\11x17 Maps\08 Vehicle Ownership by Census Block.mxd

Vehicle Ownership by Census Block
Southwest County - Northern Portion

Figure
SN 8

CLACKAMAS COUNTY TRANSPORTATION SYSTEM PLAN Update



Households with Less Than Two Vehicles

- 0% - 10%
- 10% - 15%
- 15% - 25%
- 25% - 100%
- No Population/No Data
- Incorporated Areas
- County Boundary
- UGB

0 1 2 3 4 Miles

Coordinate System:
NAD 1983 HARN StatePlane Oregon North FIPS 3601 Feet Intl

Data Source: US Census Bureau (2010 SF1, 5-year ACS estimates, Tiger/Line Shapefiles) Map and analysis by Liz Paterson, April 2012, Oregon Public Health Institute Clackamas County, Metro Data Resouce Center

Vehicle Ownership by Census Block
Southwest County - Southern Portion

Figure
SS 8

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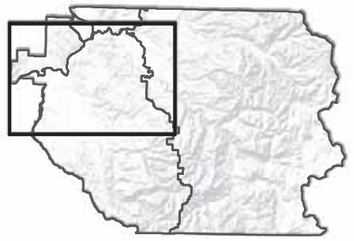
CLACKAMAS COUNTY TRANSPORTATION SYSTEM PLAN Update



Transportation Disadvantaged

- No Data
- Least Disadvantaged
- Somewhat Disadvantaged
- Disadvantaged
- Most Disadvantaged
- Incorporated Areas
- County Boundary
- UGB

The Transportation Disadvantaged Index takes into account a number of demographic characteristics including age, income, ethnicity, vehicle ownership, ability to speak English, and proximity of freeway or highways to a household. The higher the index number the more disadvantaged the population is with respect to transportation.

More specifically the index is calculated at the census block level as the sum of people 65 and older, 17 and younger, under 200% of the poverty line, non-white and non-Hispanic, living in households with 0-1 vehicles, and living in households where no adult speaks English well. That sum is divided by total block population; twenty-five is added for areas within 500 feet of a freeway or highway. People fitting into multiple vulnerability categories are counted multiple times. Data at the household level is multiplied by 2.56 to convert it to a person unit. The number 2.56 is the average household size for Clackamas County. Data only available by tract is distributed among blocks based on the distribution of tract population.

0 1 2 3 4 Miles

Coordinate System:
NAD 1983 HARN StatePlane Oregon North FIPS 3601 Feet Intl

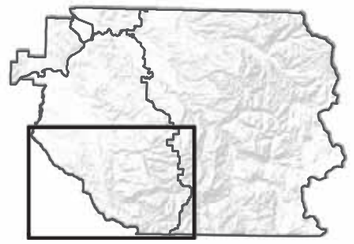
Data Source: US Census Bureau (2010 SF1, 5-year ACS estimates, Tiger/Line Shapefiles) Map and analysis by Liz Paterson, April 2012, Oregon Public Health Institute, Clackamas County, Metro Data Resouce Center

H:\proj\file\11732 - Clackamas County TSP\gis\11x17 Maps\09 Transportation Disadvantaged Populations by Census Block.mxd

Transportation Disadvantaged Populations by Census Block
Southwest County - Northern Portion

Figure
SN 9

CLACKAMAS COUNTY Transportation System Plan Update



Transportation Disadvantaged

- No Data
- Least Disadvantaged
- Somewhat Disadvantaged
- Disadvantaged
- Most Disadvantaged
- Incorporated Areas
- County Boundary
- UGB

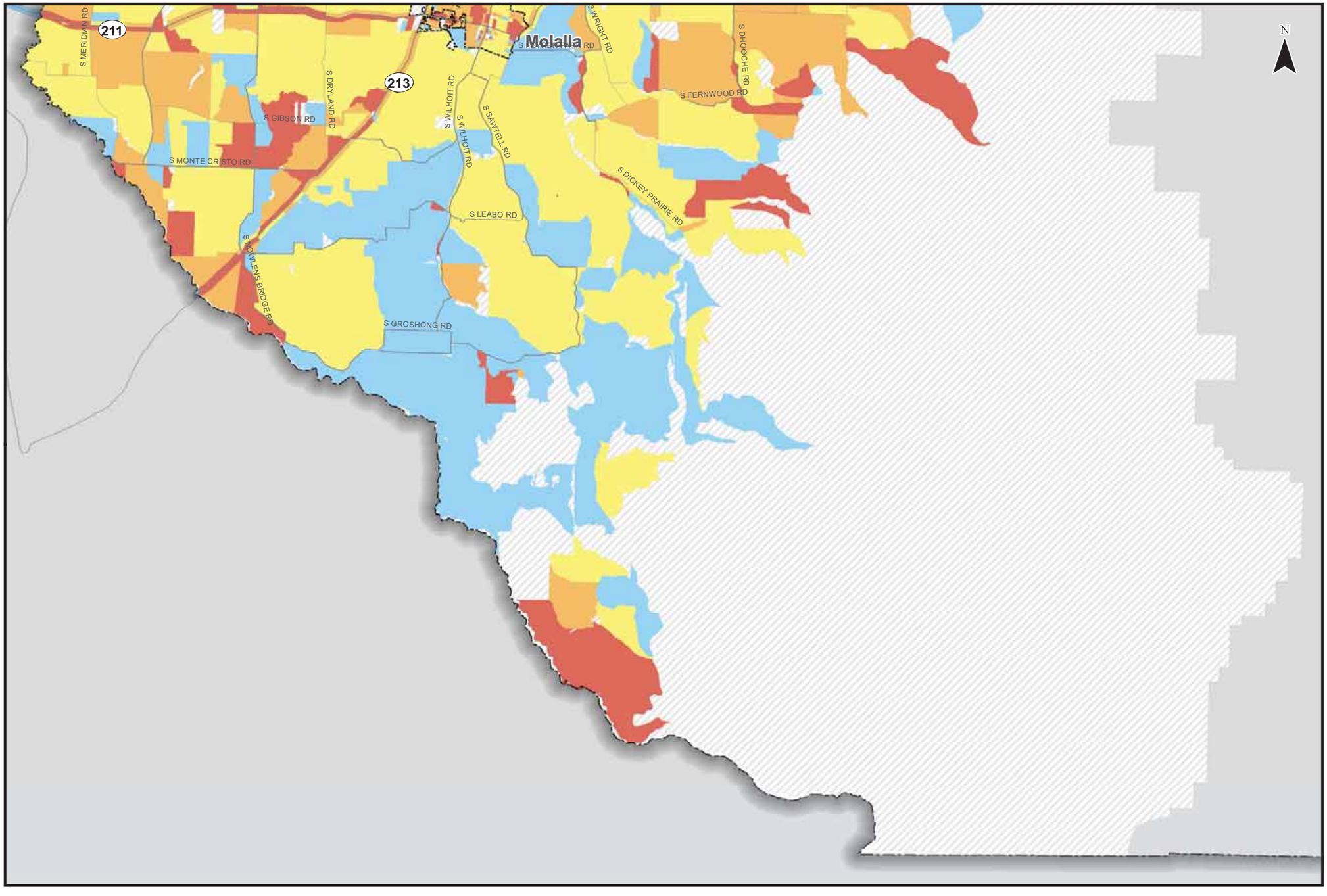
The Transportation Disadvantaged Index takes into account a number of demographic characteristics including age, income, ethnicity, vehicle ownership, ability to speak English, and proximity of freeway or highways to a household. The higher the index number the more disadvantaged the population is with respect to transportation.

More specifically the index is calculated at the census block level as the sum of people 65 and older, 17 and younger, under 200% of the poverty line, non-white and non-Hispanic, living in households with 0-1 vehicles, and living in households where no adult speaks English well. That sum is divided by total block population; twenty-five is added for areas within 500 feet of a freeway or highway. People fitting into multiple vulnerability categories are counted multiple times. Data at the household level is multiplied by 2.56 to convert it to a person unit. The number 2.56 is the average household size for Clackamas County. Data only available by tract is distributed among blocks based on the distribution of tract population.

0 1 2 3 4 Miles

Coordinate System:
NAD 1983 HARN StatePlane Oregon North FIPS 3601 Feet Intl

Data Source: US Census Bureau (2010 SF1, 5-year ACS estimates, Tiger/Line Shapefiles) Map and analysis by Liz Paterson, April 2012, Oregon Public Health Institute, Clackamas County, Metro Data Resouce Center



Transportation Disadvantaged Populations by Census Block
Southwest County - Southern Portion

Figure
SS 9

TRANSPORTATION SYSTEM OPERATIONS ANALYSIS

This section summarizes the existing transportation system operations. It includes a review of the roadway and intersection operations with a focus on vehicular travel, as well as the pedestrian and bicycle system, public transportation system, and crash data from the area. A discussion of the methodology and approach for this analysis is provided in *Section 3 Assumptions and Methods* of this report. While this report attempts to accurately reflect the existing conditions of the transportation system in the Southwest County, it is not meant to serve as an all-encompassing and comprehensive final assessment. Rather, it is meant to serve as a starting point for discussion by the broader community about the current state of the transportation system in Clackamas County. This information will be used to help inform the development of the Clackamas County TSP.

Figure S 10 illustrates the functional classification designations of the streets and identifies which roadways are maintained by the County. A street's functional classification reflects its role in the transportation system and defines desired operational and design characteristics. Clackamas County has six functional street classifications:

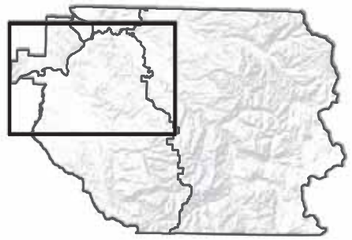
- Freeway and Expressway,
- Major Arterial,
- Minor Arterial,
- Collector,
- Connector, and
- Local Street.

These classifications and the role they play in defining a street's design and character are further described in Section 3 of this report. As seen in Figure S 10, the County does not maintain most roadways in Canby, Oregon City, or Molalla. There are also several state highways maintained by ODOT, including OR 99E, OR 170, OR 211, OR 213 and OR 224.

Figure S 11 illustrates the existing signal locations. As seen in the figure, most signalized intersections are in the incorporated areas of Oregon City and Canby.

Figure S 12 maps at-grade railroad crossing locations. There are several crossings along the Oregon Pacific rail line between Canby and Molalla, as well as along the Union Pacific line between Canby and Oregon City.

CLACKAMAS COUNTY TRANSPORTATION SYSTEM PLAN Update



Functional Classifications

- Freeway
- Expressway
- Major Arterial
- Minor Arterial
- Collector
- Connector
- Local
- Forest Service Paved
- Forest Aggregate Road
- General dirt, road or trail
- Other
- Railroad
- Ferry
- Incorporated Areas
- County Boundary
- UGB

0 1 2 3 4 Miles

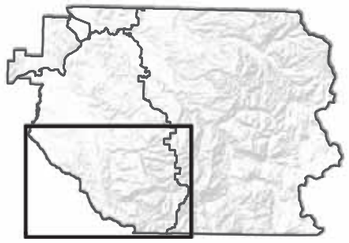
Coordinate System:
NAD 1983 HARN StatePlane Oregon North FIPS 3601 Feet Intl
Data Source:
Clackamas County, Metro Data Resouce Center

H:\proj\file\11732 - Clackamas County TSP\gis\11x17 Maps\10 Roadway Functional Classifications.mxd

Roadway Functional Classifications
Southwest County - Northern Portion

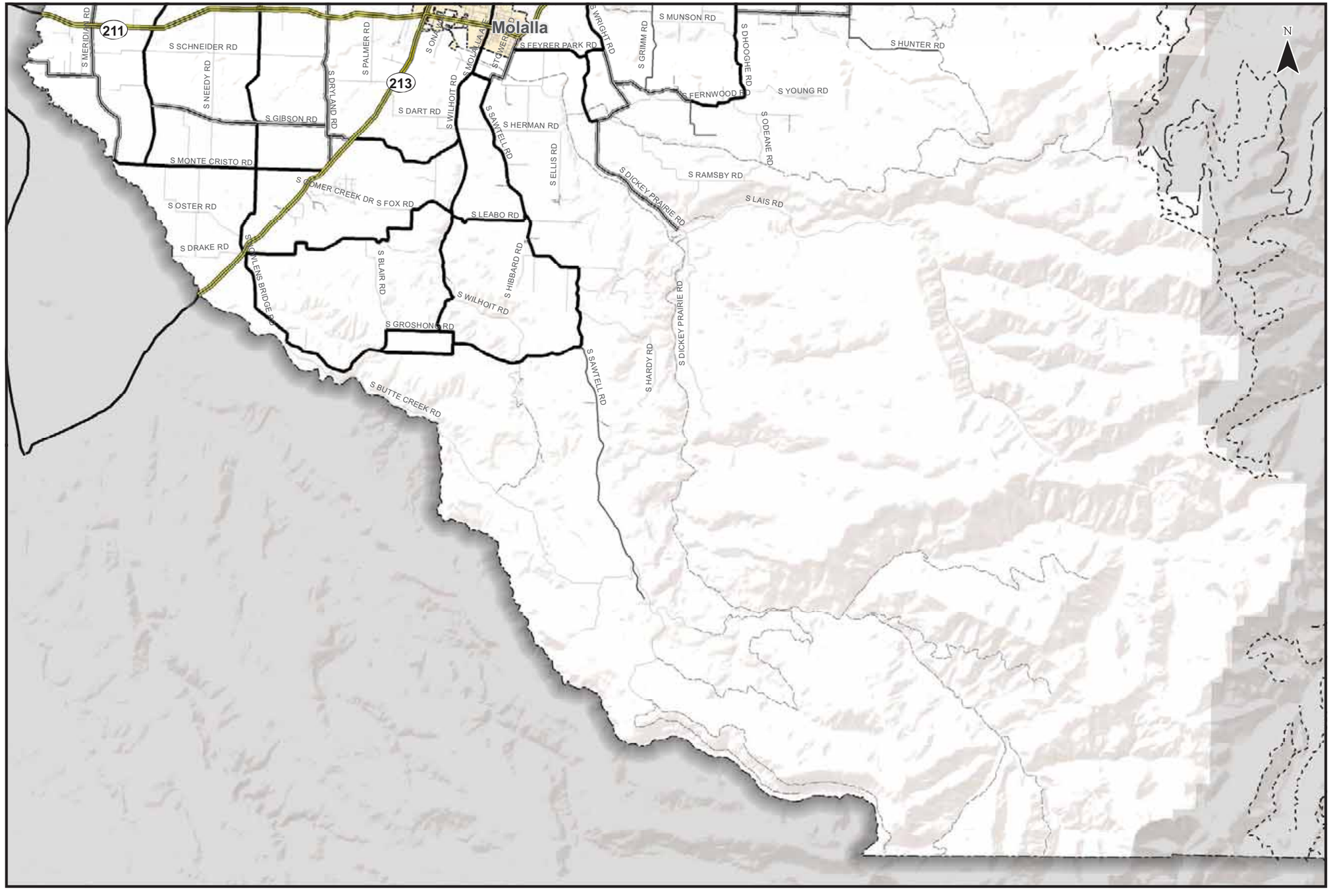
Figure
SN 10

CLACKAMAS COUNTY TRANSPORTATION SYSTEM PLAN Update



Functional Classifications

- Freeway
- Expressway
- Major Arterial
- Minor Arterial
- Collector
- Connector
- Local
- Forest Service Paved
- Forest Aggregate Road
- General dirt, road or trail
- Other
- Railroad
- Ferry
- Incorporated Areas
- County Boundary
- UGB



0 1 2 3 4 Miles

Coordinate System:
NAD 1983 HARN StatePlane Oregon North FIPS 3601 Feet Intl
Data Source:
Clackamas County, Metro Data Resouce Center

Roadway Functional Classifications
Southwest County - Southern Portion

Figure
SS 10

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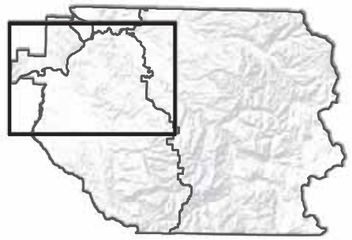
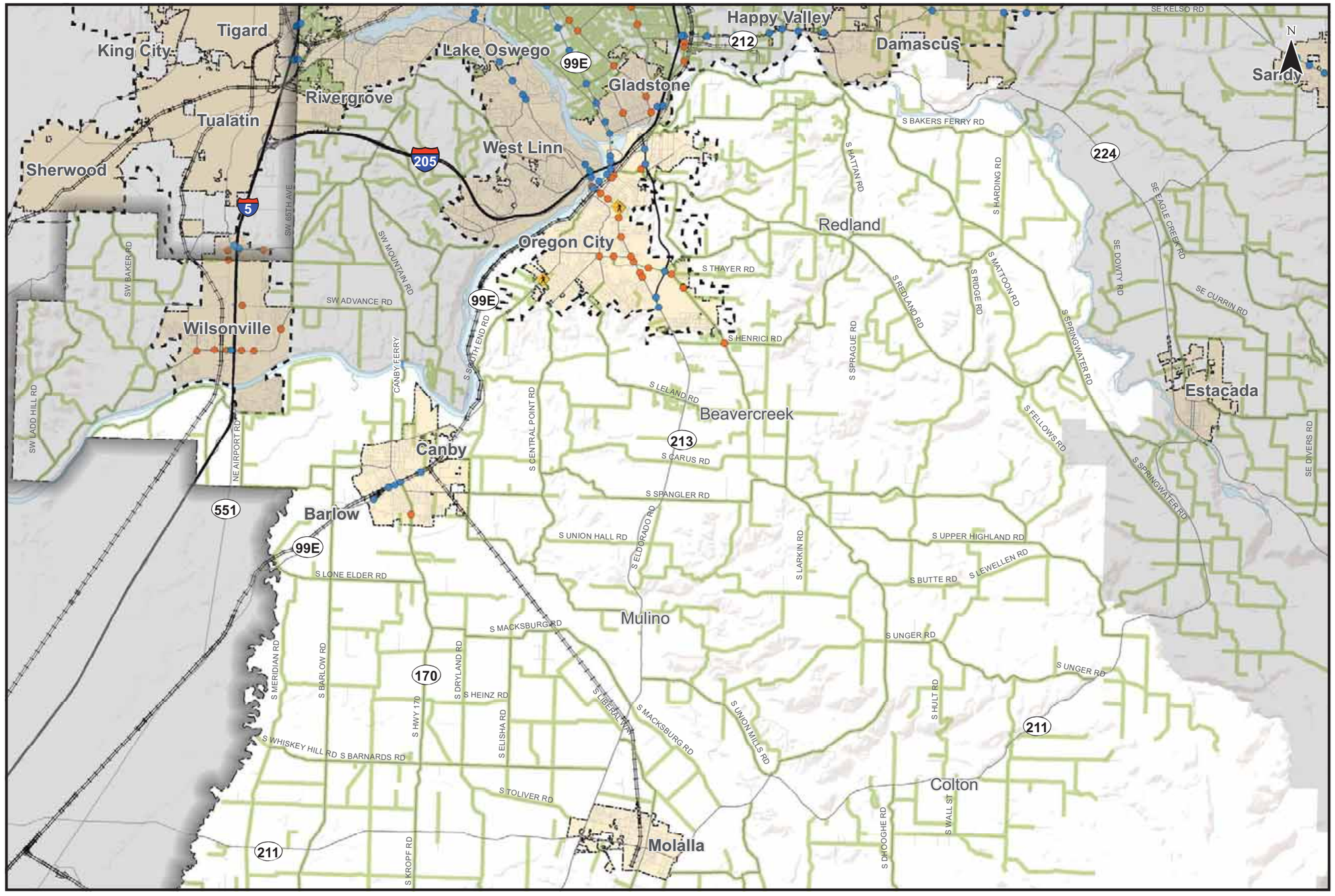
CLACKAMAS COUNTY TRANSPORTATION SYSTEM PLAN *Update*



Existing Traffic Signals

- County Owned
- ODOT Owned
- Ped Crossing Flasher
- County Maintained Roads
- Incorporated Areas
- County Boundary
- UGB



0 1 2 3 4 Miles

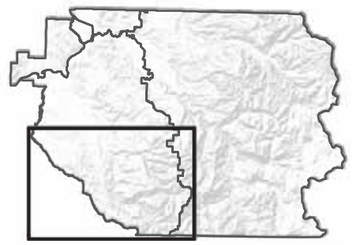
Coordinate System:
NAD 1983 HARN StatePlane Oregon North FIPS 3601 Feet Intl
Data Source:
Clackamas County, Metro Data Resouce Center

H:\proffile\11732 - Clackamas County TSP\gis\11x17 Maps\11 Existing Signal Locations.mxd

Existing Signal Locations
Southwest County - Northern Portion

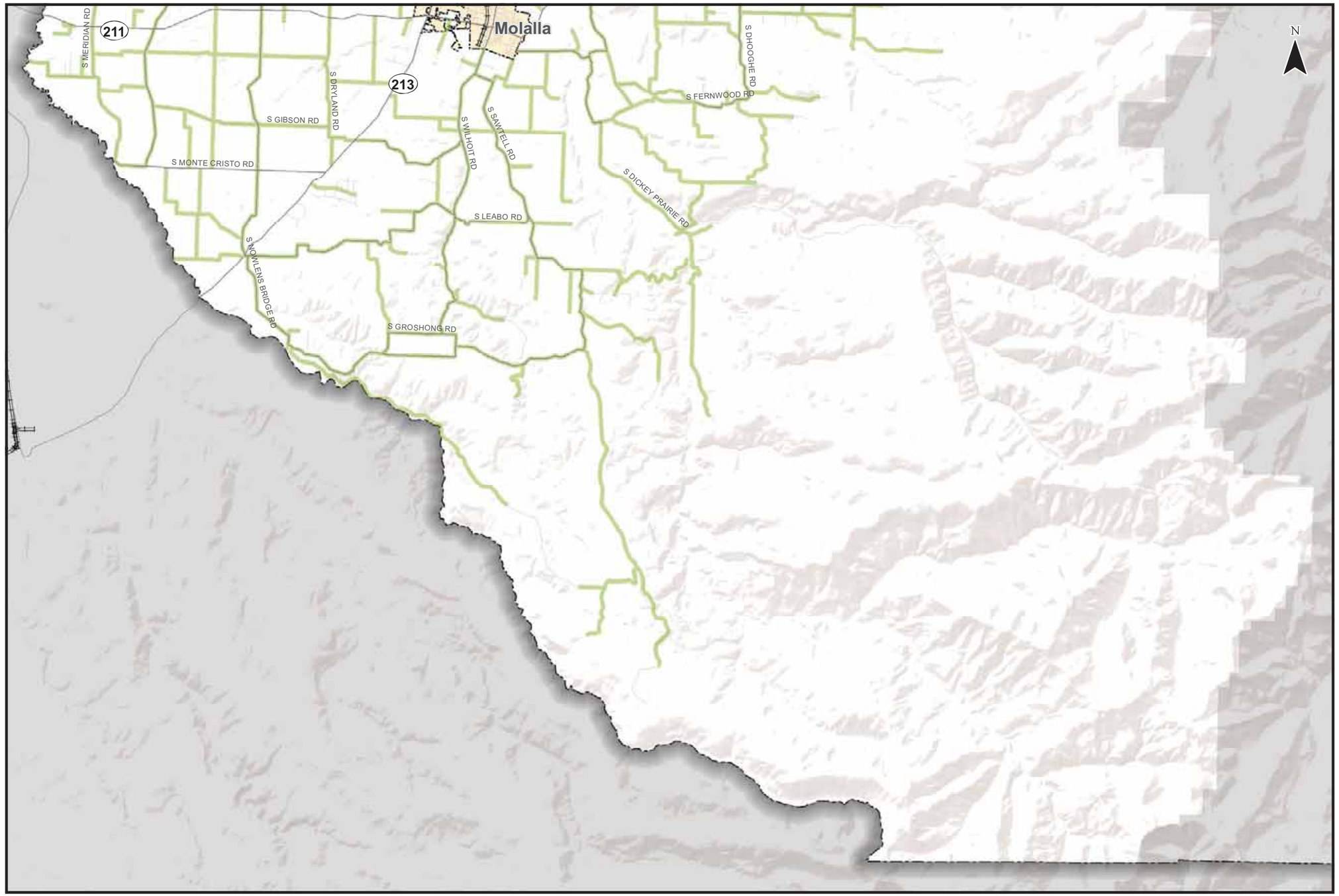
Figure
SN 11

CLACKAMAS COUNTY TRANSPORTATION SYSTEM PLAN Update



Existing Traffic Signals

- County Owned
- ODOT Owned
- Ped Crossing Flasher
- County Maintained Roads
- Incorporated Areas
- County Boundary
- UGB



0 1 2 3 4 Miles

Coordinate System:
NAD 1983 HARN StatePlane Oregon North FIPS 3601 Feet Intl
Data Source:
Clackamas County, Metro Data Resouce Center

Existing Signal Locations
Southwest County - Southern Portion

Figure
SS 11

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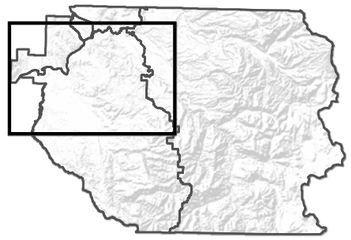
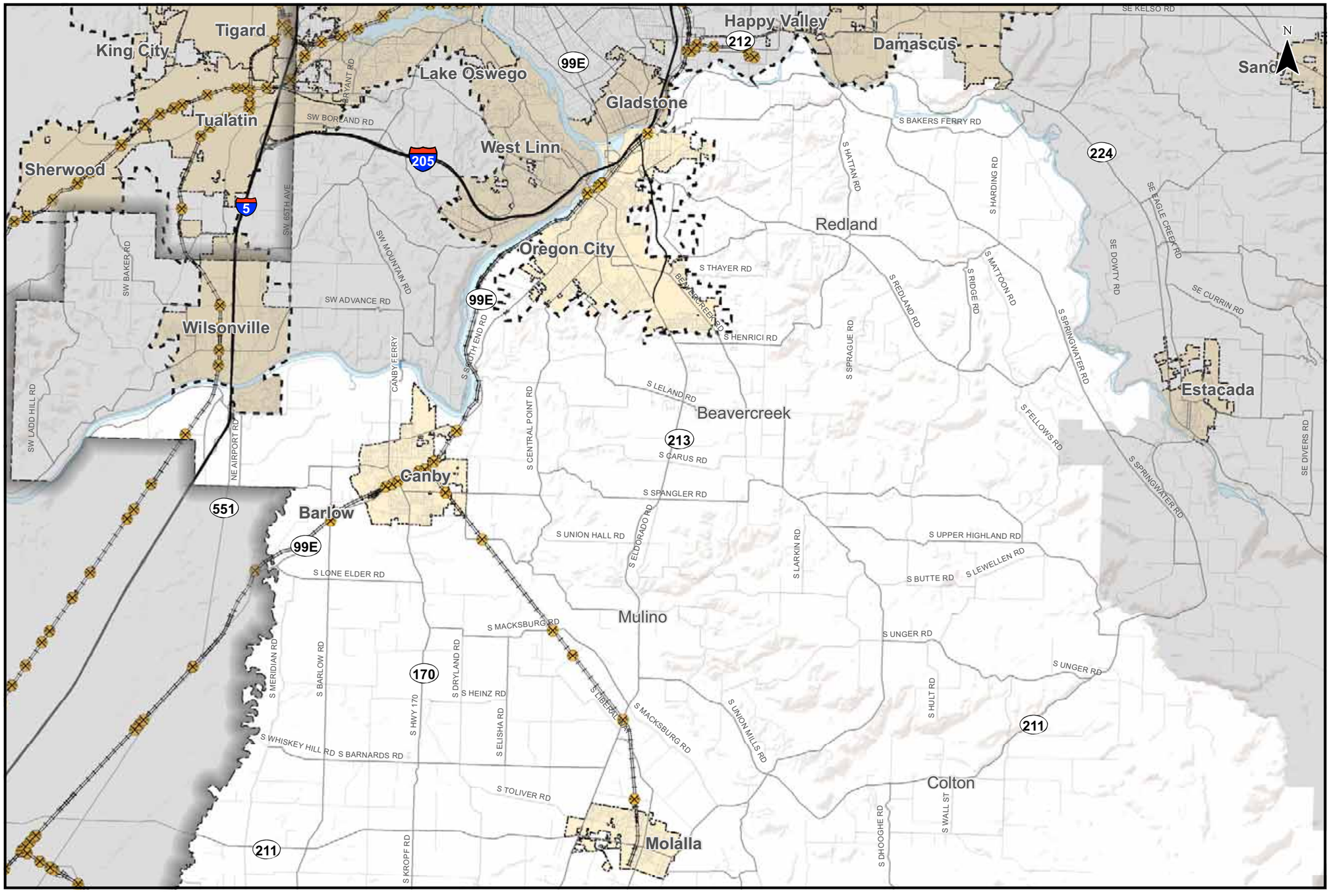
CLACKAMAS COUNTY TRANSPORTATION SYSTEM PLAN Update



- At-Grade Rail Crossings
- Railroads
- Incorporated Areas
- County Boundary
- UGB



0 1 2 3 4 Miles

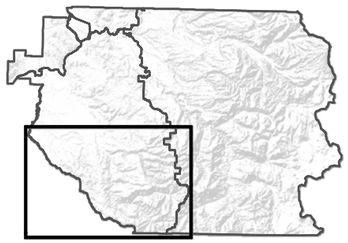
Coordinate System:
NAD 1983 HARN StatePlane Oregon North FIPS 3601 Feet Intl
Data Source:
Clackamas County, Metro Data Resouce Center

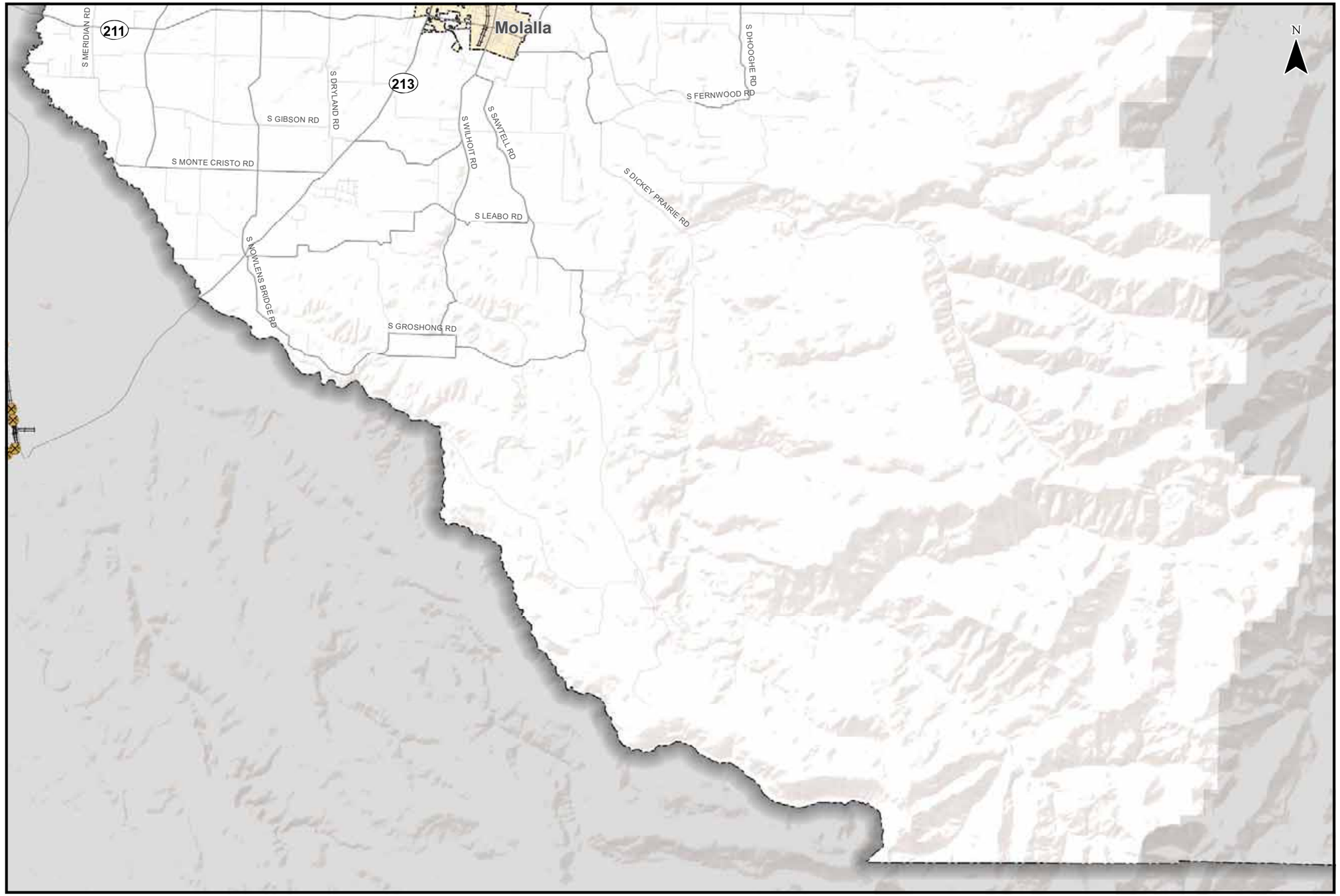
H:\proj\file\11732 - Clackamas County TSP\gis\11x17 Maps\12 At-Grade Railroad Crossing Locations.mxd

At-Grade Railroad Crossing Locations
Southwest County - Northern Portion

Figure
SN 12

CLACKAMAS COUNTY TRANSPORTATION SYSTEM PLAN Update





- At-Grade Rail Crossings
- Railroads
- Incorporated Areas
- County Boundary
- UGB

0 1 2 3 4 Miles

Coordinate System:
NAD 1983 HARN StatePlane Oregon North FIPS 3601 Feet Intl
Data Source:
Clackamas County, Metro Data Resouce Center

At-Grade Railroad Crossing Locations
Southwest County - Southern Portion

Figure
SS 12

H:\proj\file\11732 - Clackamas County TSP\gis\11x17 Maps\12 At-Grade Railroad Crossing Locations.mxd

Intersection and Road System Operations Analysis

This section summarizes the analysis and findings related to existing traffic operations with a focus on auto transportation modes. Operations were analyzed at key study intersections and roadway segments.

Study Intersection Traffic Operations Analysis

TSP study intersections were selected based on input from ODOT, city, and County staff. Figure S 13 shows the location of each study intersection and notes whether intersections fall under the County's jurisdiction or ODOT's jurisdiction. Study intersections along OR 99E, OR 211 and OR 213 are within ODOT's jurisdiction. Figure S 14 shows the existing lane configurations and traffic control devices at each location. The majority of the study intersections are unsignalized.

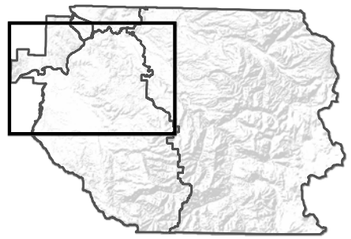
Traffic Operations Analysis Results for Study Intersections

Existing traffic operations at the study intersections were assessed based on seasonally adjusted year 2012 turning movement counts, which reflect weekday p.m. peak hour traffic conditions. The operations at each intersection were compared to the respective performance standards. The process used to evaluate the traffic operations is more extensively described in Section 3 Assumptions and Methods of this report. The results are shown in Table S 1 and Figure S 15, with intersections that are operating below performance standards noted.

Table S 1 Traffic Operations Analysis Results at Study Intersections in Southwest County

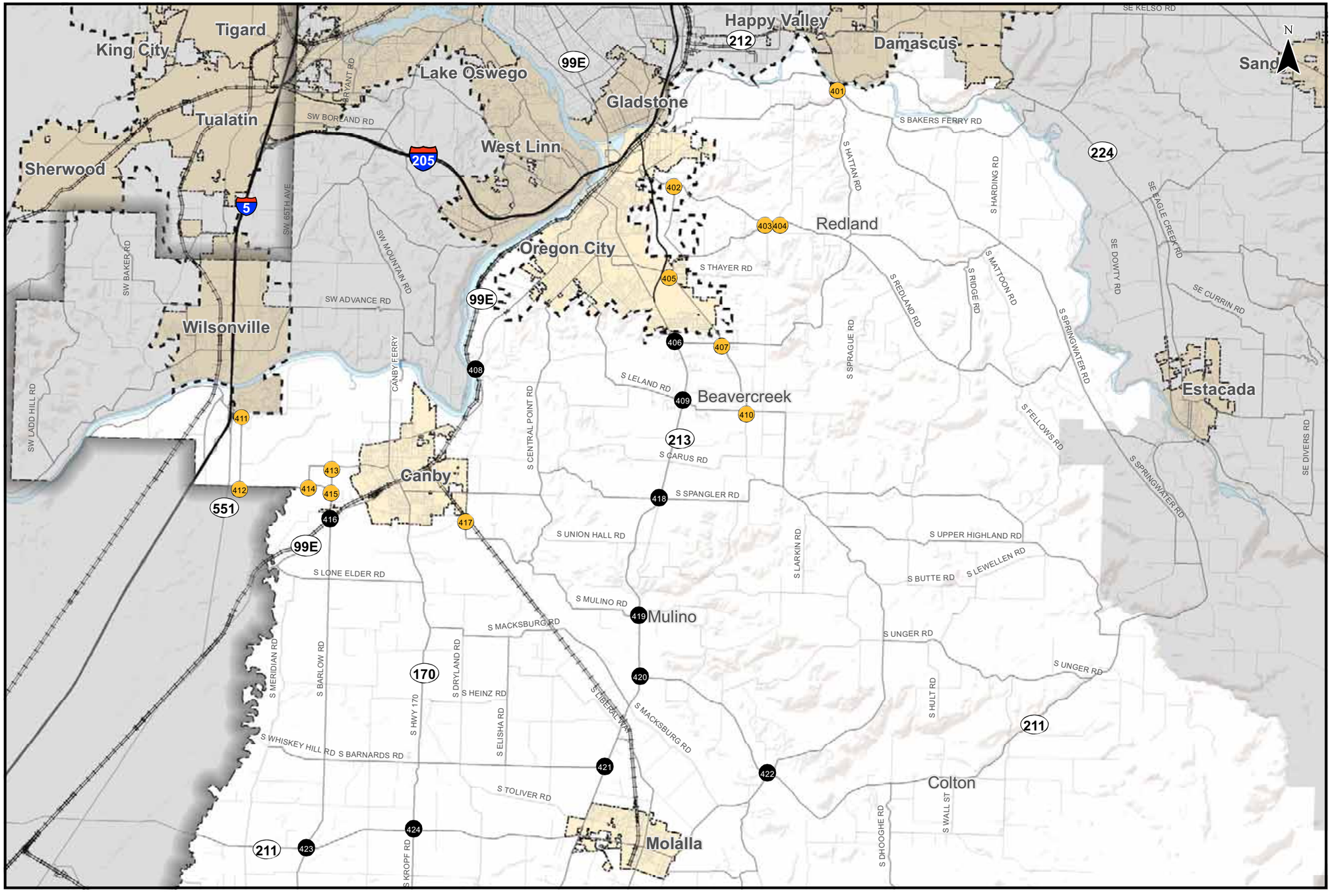
ID	Intersection	Jurisdiction	Performance Standard	Meets Standard?
401	Clackamas River Dr/Springwater Rd	County	LOS =D	No (LOS=F)
402	S. Redland Road/S. Holly Lane	County	V/C = 0.99	Yes
403	S. Redland Rd/S. Ferguson Rd	County	LOS = D	Yes
404	S. Redland Rd/S. Bradley Rd	County	LOS = D	Yes
405	S. Beavercreek Rd/S. Maple Lane Rd	County	V/C = 0.99	Yes
406	S. Henrici Rd/OR 213	ODOT	V/C = 0.75	Yes
407	S. Henrici Rd/S. Beavercreek Rd	County	LOS = D	Yes
408	South End Rd/OR 99E	ODOT	V/C = 0.75	Yes
409	S. Leland Rd/OR 213	ODOT	V/C = 0.80	No (v/c=0.83)
410	S. Leland Rd/S. Beavercreek Rd	County	LOS = D	Yes
411	NE Miley Rd/NE Airport Rd	County	LOS = D	Yes
412	Arndt Rd/NE Airport Rd	County	LOS = D	Yes
413	Knights Bridge Rd/S. Barlow Rd	County	LOS = D	Yes
414	Arndt Rd/Knights Bridge Rd	County	LOS = D	Yes
415	Arndt Rd/S. Barlow Rd	County	LOS = D	Yes
416	OR 99E/S. Barlow Rd	ODOT	V/C = 0.75	No (v/c=0.88)
417	SE 13th Ave/S. Mulino Rd	County	LOS = D	Yes
418	S. Spangler Rd/OR 213	ODOT	V/C = 0.75	Yes
419	Mulino Rd/OR 213	ODOT	V/C = 0.80	Yes
420	S. Union Mills Rd/OR 213	ODOT	V/C = 0.75	Yes
421	S. Barnards Rd/OR 213	ODOT	V/C = 0.75	Yes
422	S. Union Mills Rd/S. Beavercreek Rd	ODOT	V/C = 0.75	Yes
423	OR 211/Barlow Rd	ODOT	V/C = 0.75	Yes
424	OR 211/Canby Marquam	ODOT	V/C = 0.75	Yes

CLACKAMAS COUNTY TRANSPORTATION SYSTEM PLAN Update



Study Intersection Jurisdiction

- ### ODOT
- ### Clackamas County
- Incorporated Areas
- County Boundary
- UGB



0 1 2 3 4 Miles

Coordinate System:
NAD 1983 HARN StatePlane Oregon North FIPS 3601 Feet Intl
Data Source:
Clackamas County, Metro Data Resouce Center

H:\proj\file\11732 - Clackamas County TSP\gis\11x17 Maps\13 Transportation System Plan Study Intersections.mxd

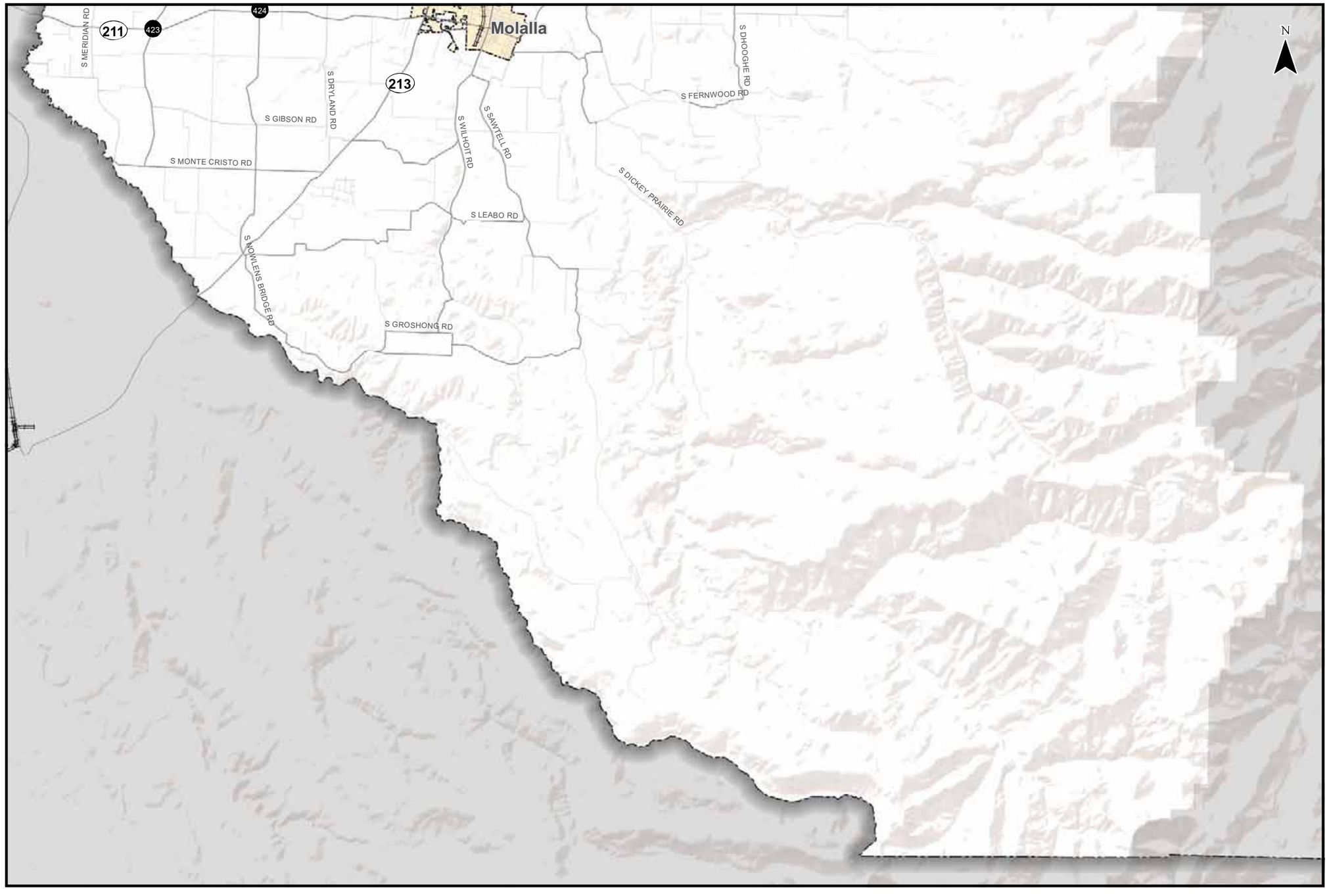
Transportation System Plan Study Intersections
Southwest County - Northern Portion

Figure
SN 13

CLACKAMAS COUNTY Transportation System Plan Update

Study Intersection Jurisdiction

- ### ODOT
- ### Clackamas County
- Incorporated Areas
- County Boundary
- UGB



0 1 2 3 4 Miles

Coordinate System:
NAD 1983 HARN StatePlane Oregon North FIPS 3601 Feet Intl
Data Source:
Clackamas County, Metro Data Resouce Center

Transportation System Plan Study Intersections
Southwest County - Southern Portion

Figure
SS 13

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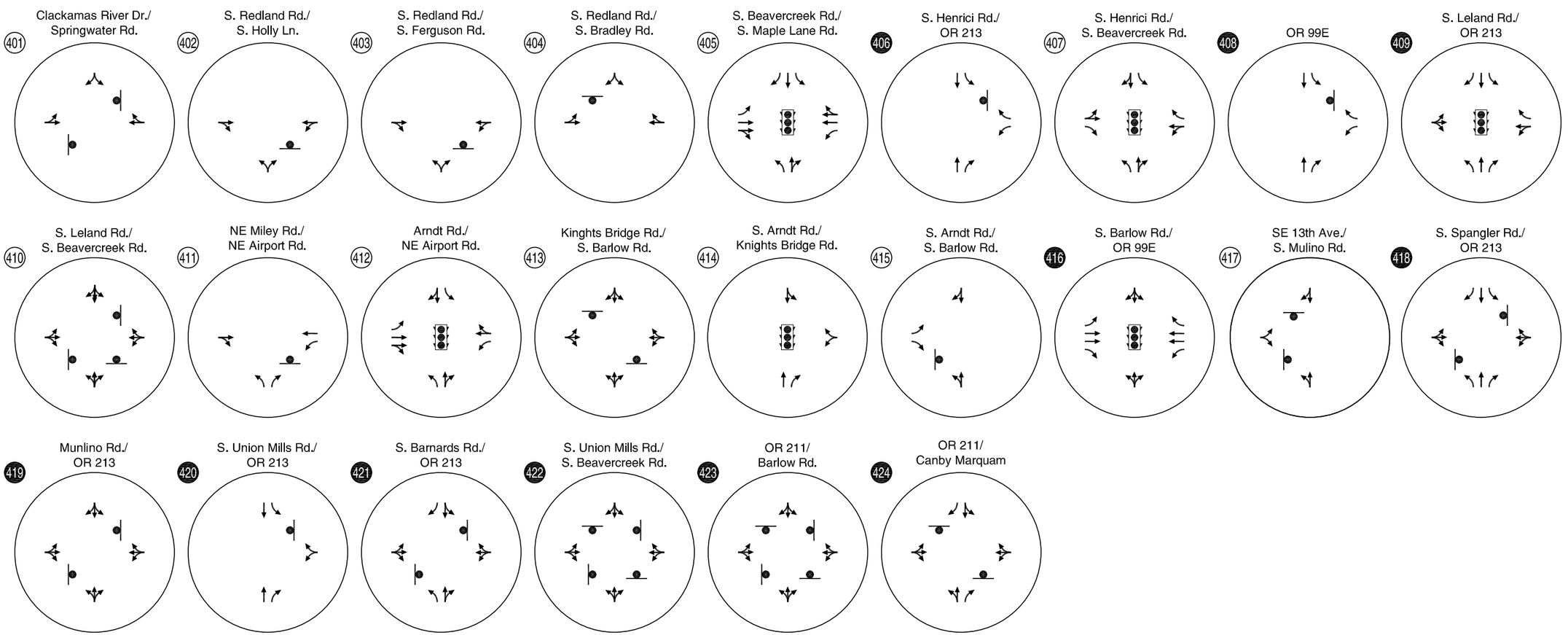


Existing Lane Configuration and Traffic Control Devices Southwest County

Figure S 14

- ## - ODOT STUDY INTERSECTION
- ## - COUNTY STUDY INTERSECTION
- STOP SIGN
- TRAFFIC SIGNAL
- ROUNDABOUT

CLACKAMAS COUNTY Update
TRANSPORTATION SYSTEM PLAN

CM = CRITICAL MOVEMENT (UNSIGNALIZED)
LOS = INTERSECTION LEVEL OF SERVICE (SIGNALIZED)/CRITICAL MOVEMENT LEVEL OF SERVICE (UNSIGNALIZED)
Del = INTERSECTION AVERAGE CONTROL DELAY (SIGNALIZED)/CRITICAL MOVEMENT CONTROL DELAY (UNSIGNALIZED)
V/C = CRITICAL VOLUME-TO-CAPACITY RATIO
STD = OPERATIONAL STANDARD

Existing Intersection Operations
PM Peak Hour
Southwest County

CLACKAMAS COUNTY Update
TRANSPORTATION SYSTEM PLAN

Figure
S 15

As shown, three intersections do not meet standards.

- At the intersection of Clackamas River Drive/Springwater Road (401), the eastbound approach of Clackamas River Drive is operating at a level of service F.
- The intersections of S. Leland Road/OR 213 (409) and OR 99E/S. Barlow Road (416) are operating at volume-to-capacity ratios slightly higher than the standards.

The remaining 21 study intersections operate within the volume-to-capacity ratio or level of service standards. *Appendix 8* contains detailed traffic operations analysis results.

Roadway Segment Operations Analysis

The roadway segment operations analysis consists of considering the roadway segment volumes and approximate level of congestion based on a comparison of the volume to the segment capacity. *Section 3 Assumptions and Methods* provides additional details on the scope and approach to the analysis below.

Roadway Segment Volumes

The roadway segment volumes provide a sense of the demand for travel on the roadways. 0 illustrates the roadway link volumes from the weekday evening peak hour. The roadway segment volumes are from Metro's travel demand model; therefore, the roadway segment links approximate the actual roadway geometry. The roadway segment links in the model do not reflect roadway curvature. Also, the roadway segment link volumes from the model are provided for roadways of generally a major collector designation or higher, so traffic volume on local roads are not reflected.

As is evident from 0, under the existing roadway system demand for travel is highest along OR 213, OR 99E, S Beavercreek Road, S Redland Road, S Springwater Road, OR 170, and S Union Hill Road.

Approximate Level of Congestion

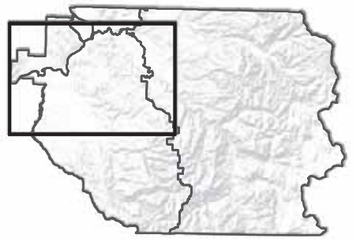
The level of congestion experienced on roadway segments was estimated using the roadway segment volumes from the Metro base model and the roadway segment capacity. The volume was compared to the capacity to calculate a volume-to-capacity ratio that is used to estimate level of congestion. **Error! Reference source not found.** summarizes the level of congestion that corresponds to different volume-to-capacity ratios.

Table S 2 Volume-to-Capacity Ranges for Roadway Segment Congestion Estimates

Congestion Level	Volume to Capacity Range
Very Congested	1.1 or greater
Congested	1.0 to 1.1
Some Congestion	0.9 to 1.0
Nearing Congestion	0.8 to 0.90
Less Congested	0.0 to 0.80

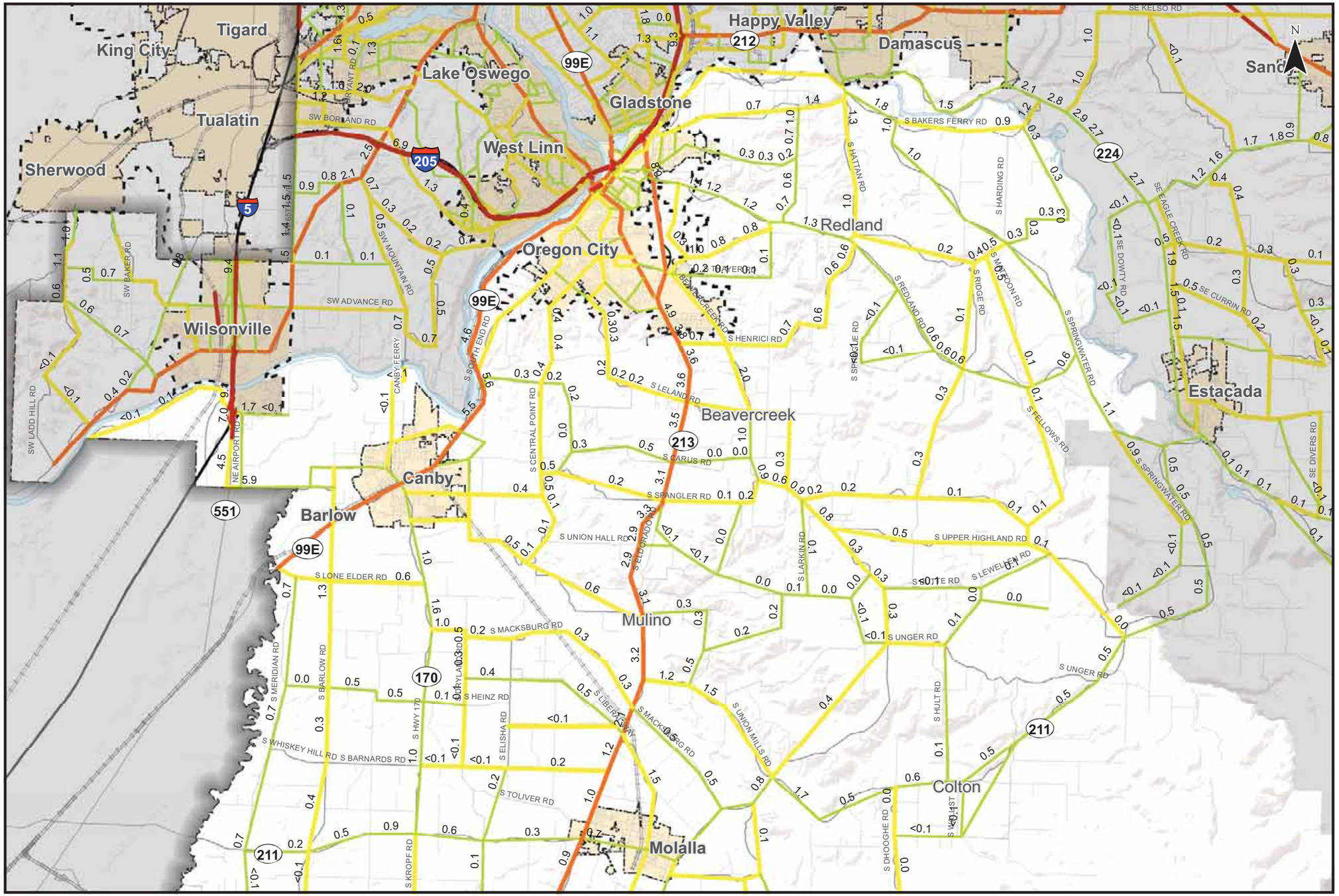
Figure S 17 illustrates the relative congestion during the weekday evening peak hours on roadways based on the estimated roadway segment volumes and capacity.

CLACKAMAS COUNTY TRANSPORTATION SYSTEM PLAN Update



2010 Base Volumes

- Freeway
- Principal / Major Arterial
- Minor Arterial
- Lower Order Facility
- #.# PM Weekday Traffic Volume in Thousands
- Incorporated Areas
- County Boundary
- UGB



0 1 2 3 4 Miles

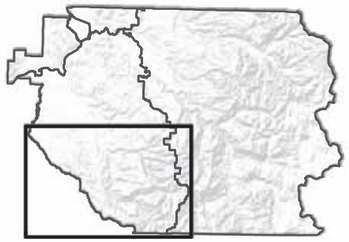
Coordinate System:
NAD 1983 HARN StatePlane Oregon North FIPS 3601 Feet Intl
Data Source: Cambridge Systematics, Clackamas County, Metro Data Resouce Center

Evening Weekday Peak Hour Link Volumes 2010 Base Year
Southwest County - Northern Portion

Figure
SN 16

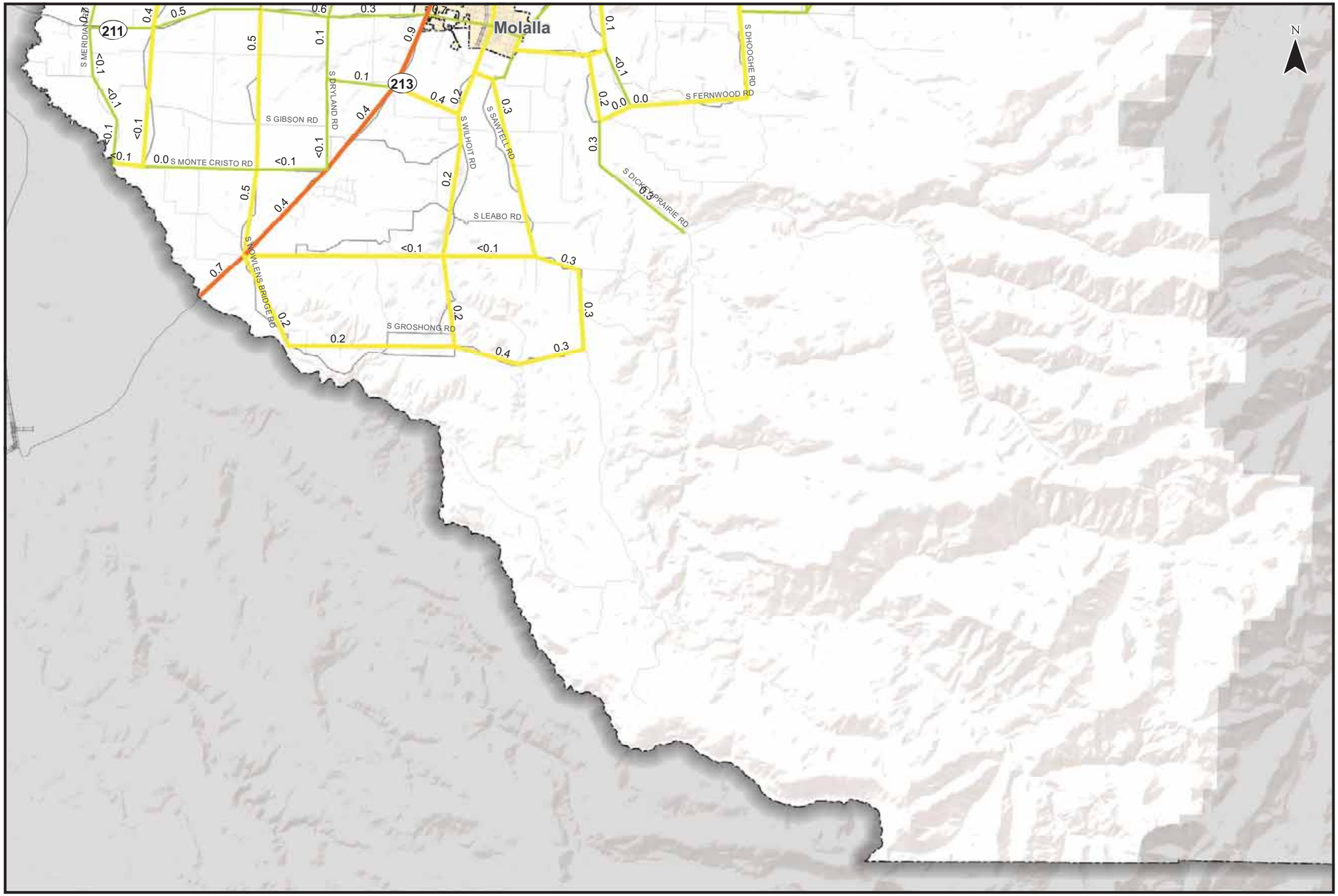
H:\proj\file\11732 - Clackamas County TSP\gis\11x17 Maps\16 Evening Weekday Peak Hour Link Volumes 2010 Base Year.mxd

CLACKAMAS COUNTY TRANSPORTATION SYSTEM PLAN Update



2010 Base Volumes

- Freeway
- Principal / Major Arterial
- Minor Arterial
- Lower Order Facility
- #.# PM Weekday Traffic Volume in Thousands
- Incorporated Areas
- County Boundary
- UGB



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Coordinate System:
NAD 1983 HARN StatePlane Oregon North FIPS 3601 Feet Intl
Data Source: Cambridge Systematics, Clackamas County, Metro Data Resouce Center

Evening Weekday Peak Hour Link Volumes 2010 Base Year
Southwest County - Southern Portion

Figure
SS 16

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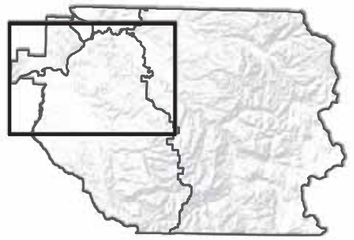
CLACKAMAS COUNTY TRANSPORTATION SYSTEM PLAN *Update*



Very Congested >1.10
- 1,000 Vehicles
- 5,000 Vehicles
- 10,000 Vehicles

Congested 1.0 - 1.1
- 1,000 Vehicles
- 5,000 Vehicles
- 10,000 Vehicles

Some Congestion 0.9 - 1.0
- 1,000 Vehicles
- 5,000 Vehicles
- 10,000 Vehicles

Nearing Congestion 0.8 - 0.9
- 1,000 Vehicles
- 5,000 Vehicles
- 10,000 Vehicles

Less Congested <0.8
- 1,000 Vehicles
- 5,000 Vehicles
- 10,000 Vehicles
- Incorporated Areas
- County Boundary
- UGB

0 1 2 3 4 Miles

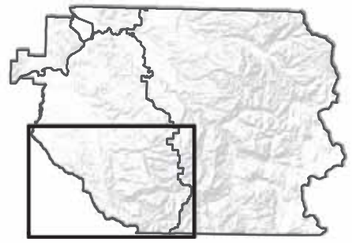
Coordinate System:
NAD 1983 HARN StatePlane Oregon North FIPS 3601 Feet Intl
Data Source: Cambridge Systematics, Clackamas County, Metro Data Resouce Center

H:\proj\file\11732 - Clackamas County TSP\gis\11x17 Maps\17 Evening Weekday Peak Hour Roadway Segment Congestion 2010 Base Year.mxd

Evening Weekday Peak Hour Roadway Segment Congestion 2010 Base Year
Southwest County - Northern Portion

Figure
SN 17

CLACKAMAS COUNTY TRANSPORTATION SYSTEM PLAN *Update*



Very Congested >1.10
- 1,000 Vehicles
- 5,000 Vehicles
- 10,000 Vehicles

Congested 1.0 - 1.1
- 1,000 Vehicles
- 5,000 Vehicles
- 10,000 Vehicles

Some Congestion 0.9 - 1.0
- 1,000 Vehicles
- 5,000 Vehicles
- 10,000 Vehicles

Nearing Congestion 0.8 - 0.9
- 1,000 Vehicles
- 5,000 Vehicles
- 10,000 Vehicles

Less Congested <0.8
- 1,000 Vehicles
- 5,000 Vehicles
- 10,000 Vehicles
- Incorporated Areas
- County Boundary
- UGB

0 1 2 3 4 Miles

Coordinate System:
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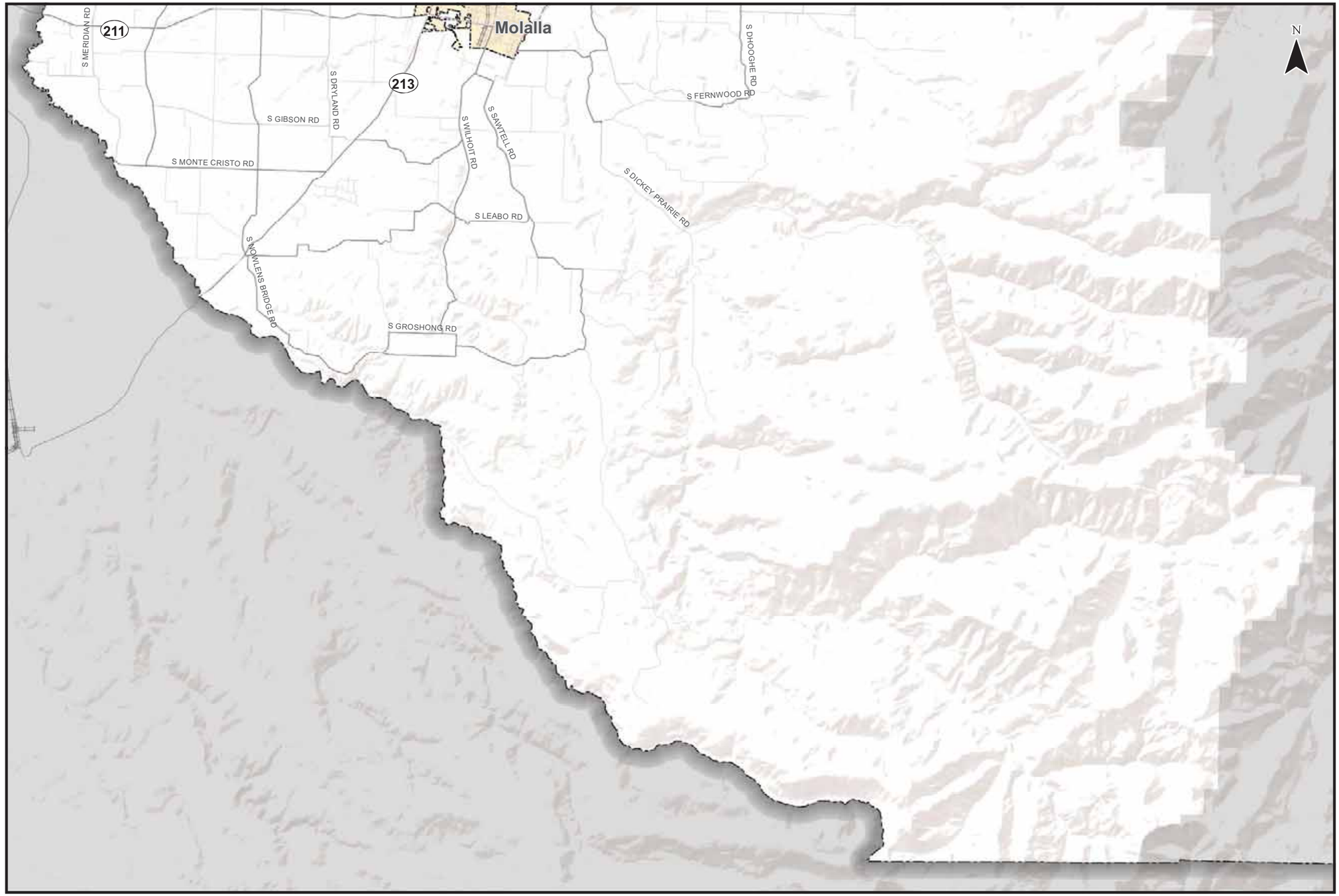


Evening Weekday Peak Hour Roadway Segment Congestion 2010 Base Year
Southwest County - Southern Portion

Figure
SS 17

H:\proj\file\11732 - Clackamas County TSP\gis\11x17 Maps\17 Evening Weekday Peak Hour Roadway Segment Congestion 2010 Base Year.mxd

It is possible for the study intersection analysis results to indicate there are intersections experiencing relatively high amounts of delay on roadway segments that are shown as experiencing relatively minimal congestion. The roadway segment analysis considers only the capacity of the lanes on the segment and the volumes on the segment. It is an idealized assessment of volume to capacity (e.g., if all vehicles were traveling in the same direction along a roadway, how many vehicles could the roadway carry). In actuality, motorists experience congestion on roadway segments due to intersection operations. The purpose of the roadway segment analysis is to help identify if the delay being experienced (or anticipated to be experienced in the future) is primarily related to the intersection or the roadway segment.

As can be seen in Figure S 17, under the 2010 Base Year the roadway segments outside of the Urban Growth Boundary (UGB) are primarily uncongested during the weekday evening peak hour. OR 213 through and adjacent to Oregon City experiences some congestion, and Arndt Road NE located north of Barlow and south of Wilsonville experiences congestion under the 2010 Base Year. A similar analysis was conducted for two future year scenarios; the results of that analysis are discussed further below in the section presenting Future Conditions for Southwest County. Table S 3 **Error! Reference source not found.**lists the roadway segments that have volume-to-capacity ratios over 0.8 and describes the level of congestion as nearing congestion, some congestion, congested, or very congested.

Table S 3 2010 Base Year Roadway Segment Congestion in Southwest County

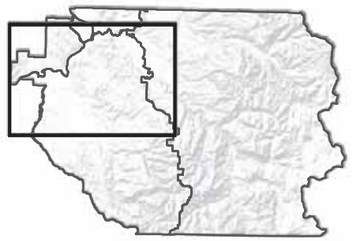
Roadway	Segment	Level of Congestion
OR 551	County Boundary to I-5	Some Congestion to Congested
S Arndt Rd	OR 551 to S Barlow Rd	Nearing Congestion to Very Congested
S Barlow Rd	OR 99E to S Arndt Rd	Nearing Congestion
OR 213	Oregon City southern UGB boundary to northern boundary	Nearing Congestion to Congested

Pedestrian and Bicycle System

Figure S 18 illustrates the location of sidewalks, multi-use paths, and crosswalk signals. Figure S 19 illustrates the location of bike lanes, multi-use paths and shoulder bikeways on roadways in the County. The information is based on inventory data obtained from the County, TriMet, and ODOT.

As shown in Figure S 18, there are no sidewalks in the Southwest County area except within the cities of Oregon City, Canby, and Molalla (*note that the data shown within cities and unincorporated communities is not complete and primarily includes state and county facilities only*). Sidewalks are only required in "unincorporated communities," which are identified as Rural Centers in the pedestrian maps. They include Rural Communities, Rural Service Centers, Resort Communities and Urban Unincorporated Communities as defined by the County's Comprehensive Plan. Within "unincorporated communities", sidewalks or walkways are to be provided adjacent to or within areas of development, such as schools, businesses, or employment centers near or along highways. Gaps in the rural area pedestrian network include all facilities within Rural Centers that do not have a sidewalk or walkway adjacent to or within such areas of development. Based on rural roadway standards, there are no deficiencies in the pedestrian system except in the Rural Centers of Colton, Mulino, Redland, and Beavercreek.

CLACKAMAS COUNTY TRANSPORTATION SYSTEM PLAN Update



Pedestrian Network

- Sidewalks
- 76% to 99% Complete
- 51% to 75% Complete
- 26% to 50% Complete
- 1% to 25% Complete
- No Sidewalks
- Multi-Use Path
- Ped Crossing Flasher
- Incorporated Areas
- County Boundary
- UGB

0 1 2 3 4 Miles

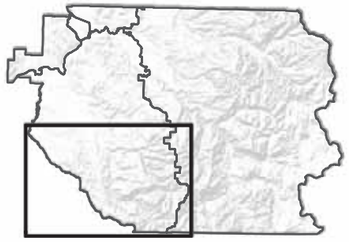
Coordinate System:
NAD 1983 HARN StatePlane Oregon North FIPS 3601 Feet Intl
Data Source:
Clackamas County, Metro Data Resouce Center

H:\profile\11732 - Clackamas County TSP\gis\11x17 Maps\18 Pedestrian Network.mxd

Pedestrian Network
Southwest County - Northern Portion

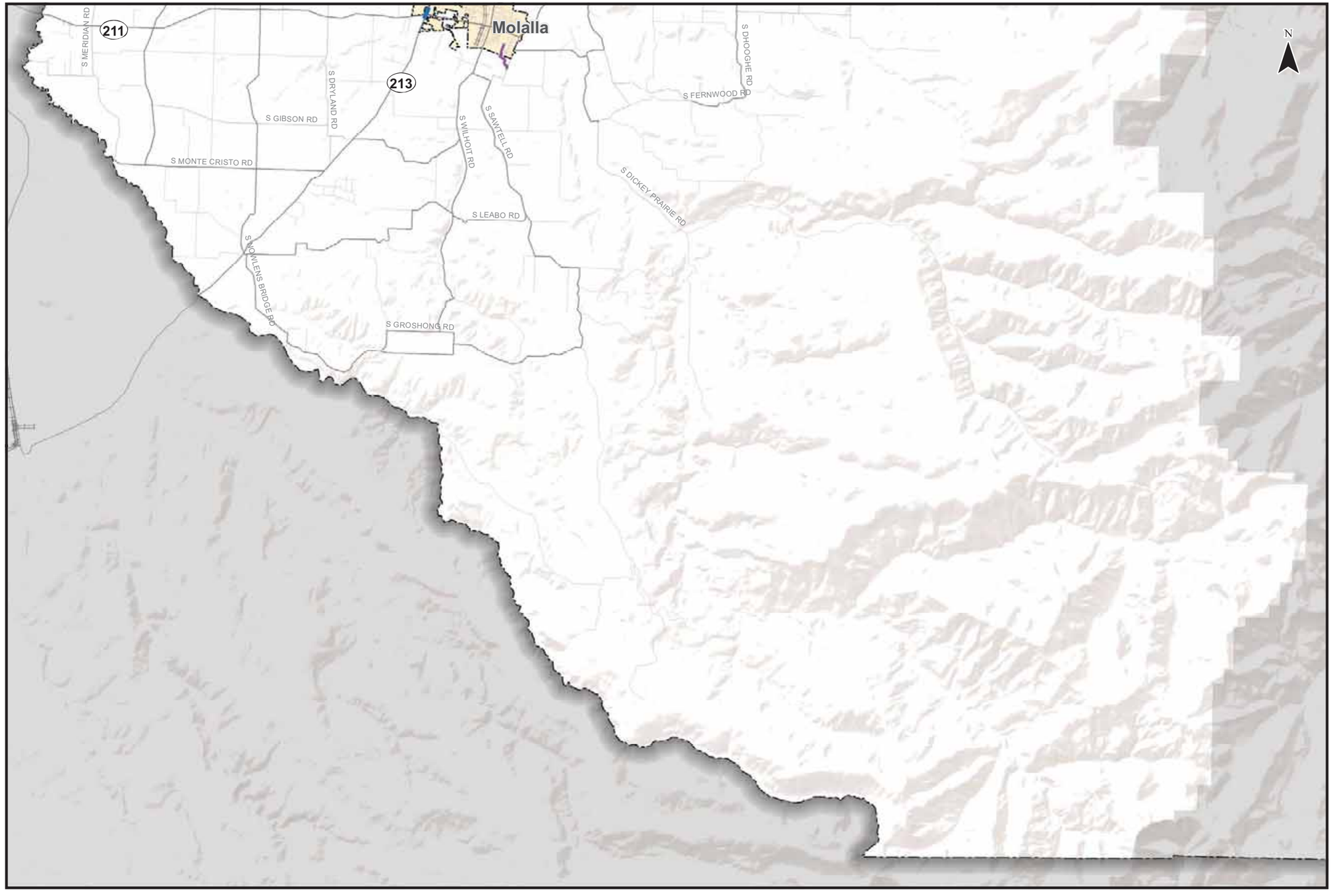
Figure
SN 18

CLACKAMAS COUNTY TRANSPORTATION SYSTEM PLAN Update



Pedestrian Network

- Sidewalks
- 76% to 99% Complete
- 51% to 75% Complete
- 26% to 50% Complete
- 1% to 25% Complete
- No Sidewalks
- Multi-Use Path
- Ped Crossing Flasher
- Incorporated Areas
- County Boundary
- UGB



0 1 2 3 4 Miles

Coordinate System:
NAD 1983 HARN StatePlane Oregon North FIPS 3601 Feet Intl
Data Source:
Clackamas County, Metro Data Resouce Center

Pedestrian Network
Southwest County - Southern Portion

Figure
SS 18

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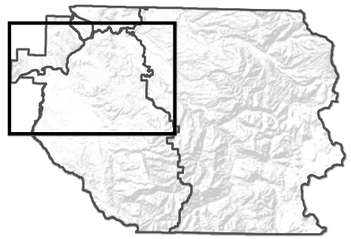
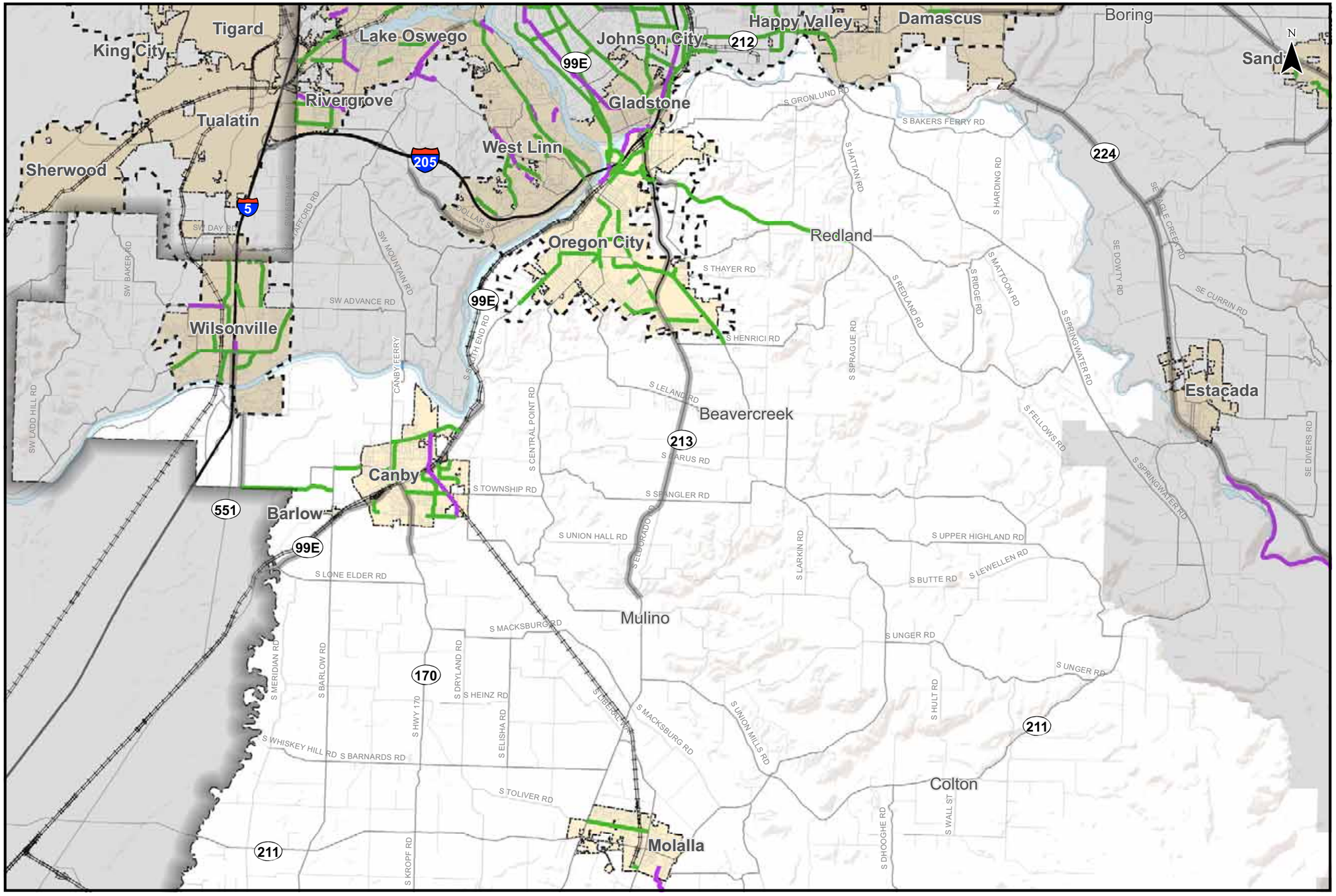
CLACKAMAS COUNTY TRANSPORTATION SYSTEM PLAN Update



Bike Facilities

- Bike Lane
- Multi-Use Path
- Shoulders (At Least 4ft Wide)
- Incorporated Areas
- County Boundary
- UGB



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Data Source:
Clackamas County, Metro Data Resouce Center

H:\proj\file\11732 - Clackamas County TSP\gis\11x17 Maps\19 Bicycle Network.mxd

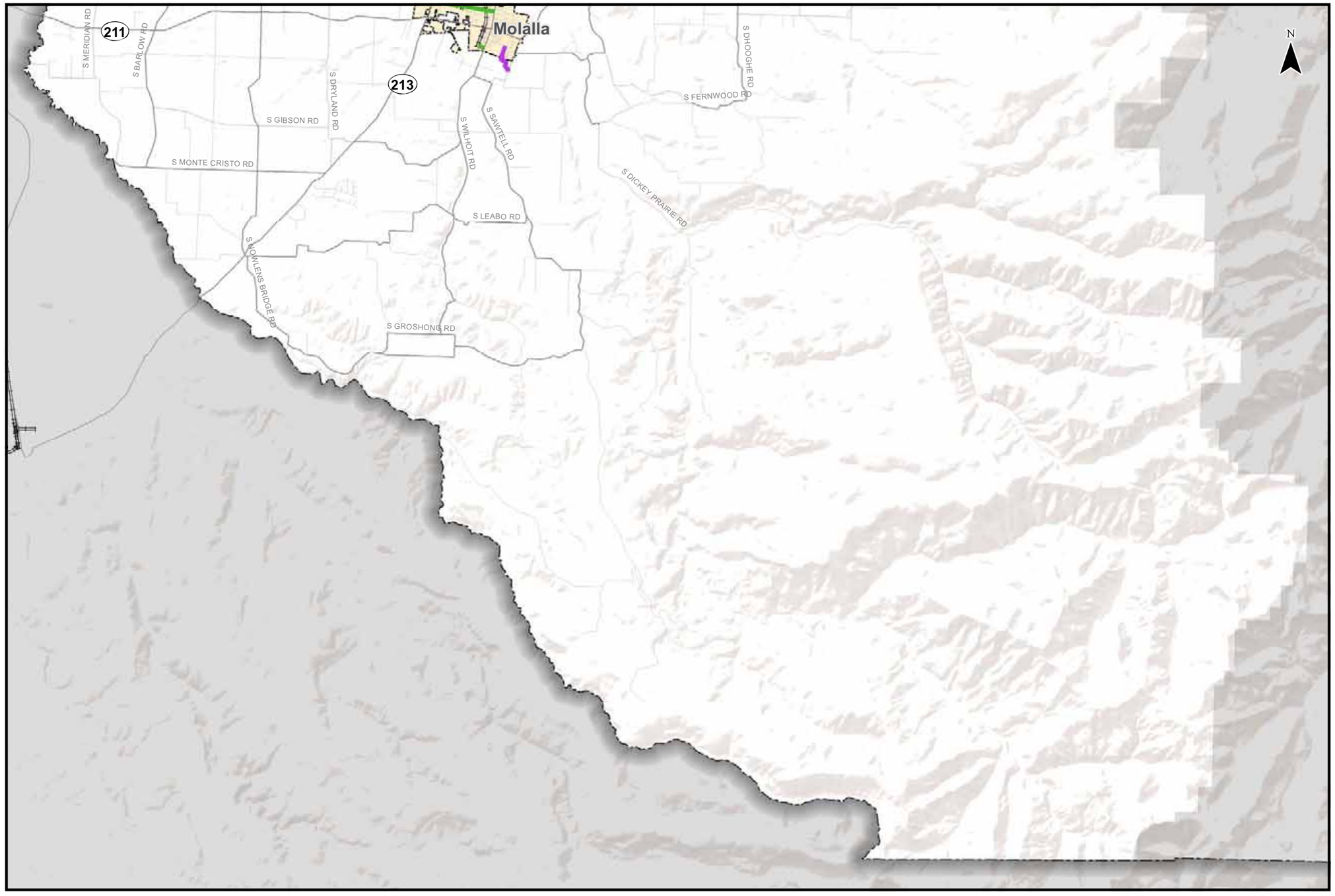
Bicycle Network
Southwest County - Northern Portion

Figure
SN 19

CLACKAMAS COUNTY TRANSPORTATION SYSTEM PLAN Update

Bike Facilities

- Bike Lane
- Multi-Use Path
- Shoulders (At Least 4ft Wide)
- Incorporated Areas
- County Boundary
- UGB



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Coordinate System:
NAD 1983 HARN StatePlane Oregon North FIPS 3601 Feet Intl
Data Source:
Clackamas County, Metro Data Resouce Center

Bicycle Network
Southwest County - Southern Portion

Figure
SS 19

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As shown in Figure S 19, the bicycle network consists primarily of shoulder bikeways (at least 4 feet wide) along the state highway system (OR 213 from Oregon City to Mulino and parts of OR 99E north and south of Canby), although there are significant gaps on OR 99E and OR 213 and nothing on OR 211 and OR 170. The county roadway system has no shoulders wide enough to be designated as shoulder bikeways with the exception of Redland Road from Oregon City to Fischers Hill Road.

Bicycle facilities should be provided on all roadways designated as Collectors or higher (i.e. Major Arterials, Minor Arterials, Connectors, and Collectors). Based on the County's current design standards, in urban areas the facility should be a bike lane and in rural areas it should be a 6 foot shoulder. The County's current comprehensive plan identifies all collector and arterial roadways in Southwest County as part of the Planned Bikeway Network (see Appendix 5 for the County's essential pedestrian and planned bikeway network maps). Existing gaps in the network include all roadways identified on the Planned Bikeway Network that do not have an existing bicycle facility (nearly all County collectors and arterials and significant portions of the state system).

The County's Bike Master Plan identifies priorities for filling in the bicycle network gaps. Table S 4 below identifies the priority bicycle projects from the Bike Master Plan in Southwest County. The priority for these projects will be reviewed by applying the evaluation criteria of the TSP Vision and Goals.

Table S 4 Bike Master Plan Projects in Southwest County

Bike Master Plan Project Number	Street Name	Section Description	Project Elements
B3	13TH	Ivy St to Molalla Forest Road	Widen, Bike lanes
B8	1ST	Sequioa Parkway to Mulino Rd Canby	Bike lanes
B26	HOLCOMB	Washington Street to Bradley	Bike lanes
RB 401	13TH	Redwood to Molalla Forest Road	Widen / Shoulder Bikeways
RB 405	BARLOW	Knight Bridge to OR 99E	Widen / Shoulder Bikeways
RB 406	BEAVERCREEK	Oregon City to OR 211	Widen / Shoulder Bikeways
RB 409	BRADLEY	Gronlund to Redland	Widen / Shoulder Bikeways
RB 410	CLACKAMAS RIVER DR	OR 213 to Springwater	Widen / Shoulder Bikeways
RB 413	FISCHERS MILL		Widen / Shoulder Bikeways
RB 415	HATTAN	Springwater to Fischers Mill	Widen / Shoulder Bikeways
RB 416	HENRICI	OR 213 to Redland Rd	Widen / Shoulder Bikeways
RB 417	HOLLY	Maplelane Rd to Redland Rd	Widen / Shoulder Bikeways
RB 418	HOLLY/37th	Territorial to 37th	Widen / Shoulder Bikeways
RB 421	MAPLELANE	Beavercreek Rd to Ferguson Rd	Widen / Shoulder Bikeways
RB 422	MILEY	Airport Rd to Eilers Rd	Widen / Shoulder Bikeways
RB 423	MOLALLA	OR 213 through Molalla	Widen / Shoulder Bikeways
RB 425	MULINO	SE 1st St to OR 213	Widen / Shoulder Bikeways
RB 430	SOUTH END	Oregon City limits to OR 99E	Widen / Shoulder Bikeways
RB 431	SPRINGWATER	Hattan to OR 211	Widen / Shoulder Bikeways
RB 437	TOLIVER	Dryland to OR 213	Widen / Shoulder Bikeways
RB 438	TOWNSHIP	Canby to Central Point Rd	Widen / Shoulder Bikeways

Bike Master Plan Project Number	Street Name	Section Description	Project Elements
SRB 501	OR 211	Mollala to Estacada	Widen/Shoulder Bikeways
SRB 503	OR 213	Mulino to Marion County	Widen/Shoulder Bikeways
51	IVY	South of Canby to OR 170	Has Bike lanes
907	OREGON CITY TO MULINO TRAIL	Not Available	OC to Mulino on Old RR right-of-way
908	MOLLALA RIVER BIKE PATH	Not Available	13th Street to Macksburg
909	CANBY - MOLLALA RR TRAIL	Not Available	Canby to Mollala Rails with Trails / Union Pacific
	13th Ave	Redwood to Molalla River Path	Bike lanes to connect existing bike lanes to multi use path

RB = Rural Bikeway, SRB = State Rural Bikeway

Public Transportation System

The public transportation system consists of fixed-route and dial-a-ride services as well as regional transit centers and park/rides. Frequent morning and evening peak hour service provides residents with weekday commute options, while less frequent mid-day, as well as Saturday and Sunday, service provides residents with access to retail, commercial, institutional, and other land uses throughout Clackamas County and the region.

Providers within Southwest Clackamas County

Four transit agencies currently provide service, including TriMet, South Clackamas Transportation District (SCTD), South Metro Area Regional Transit (SMART), and Canby Area Transit (CAT). Figure S 20 displays the fixed-route services provided by each agency within Southwest Clackamas County. These services are discussed in greater detail below.

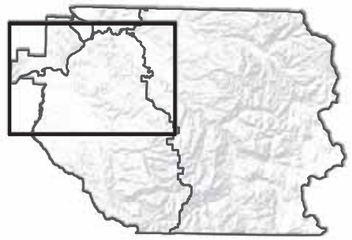
Fixed-Route Service

TriMet

TriMet operates three fixed-route bus lines, including lines 32, 33, and 99.

- All three lines provide service between the Portland City Center and Clackamas Community College via the Milwaukie City Center and the Oregon City Transit Center.
- The primary difference between the lines is:
  - line 32 provides weekday service along SE Oatfield Road from 6:58 a.m. to 7:21 p.m. on approximately 30-60 minute headways (i.e., a bus arrives ever 30 to 60 minutes); and
  - line 33 provides weekday service along McLoughlin Boulevard from 5:20 a.m. to 1:48 a.m. on 15-30 minute headways.
- Line 99 also provides service along SE McLoughlin Boulevard; however, it only operates during the weekday evening rush-hour from 2:56 p.m. to 6:52 p.m. on 15-30 minute headways.
- *All three lines connect with SCTD's Molalla to Clackamas Community College bus line at Clackamas Community College.*

CLACKAMAS COUNTY TRANSPORTATION SYSTEM PLAN Update



- Bus Stops
- Route Number
- Park & Ride

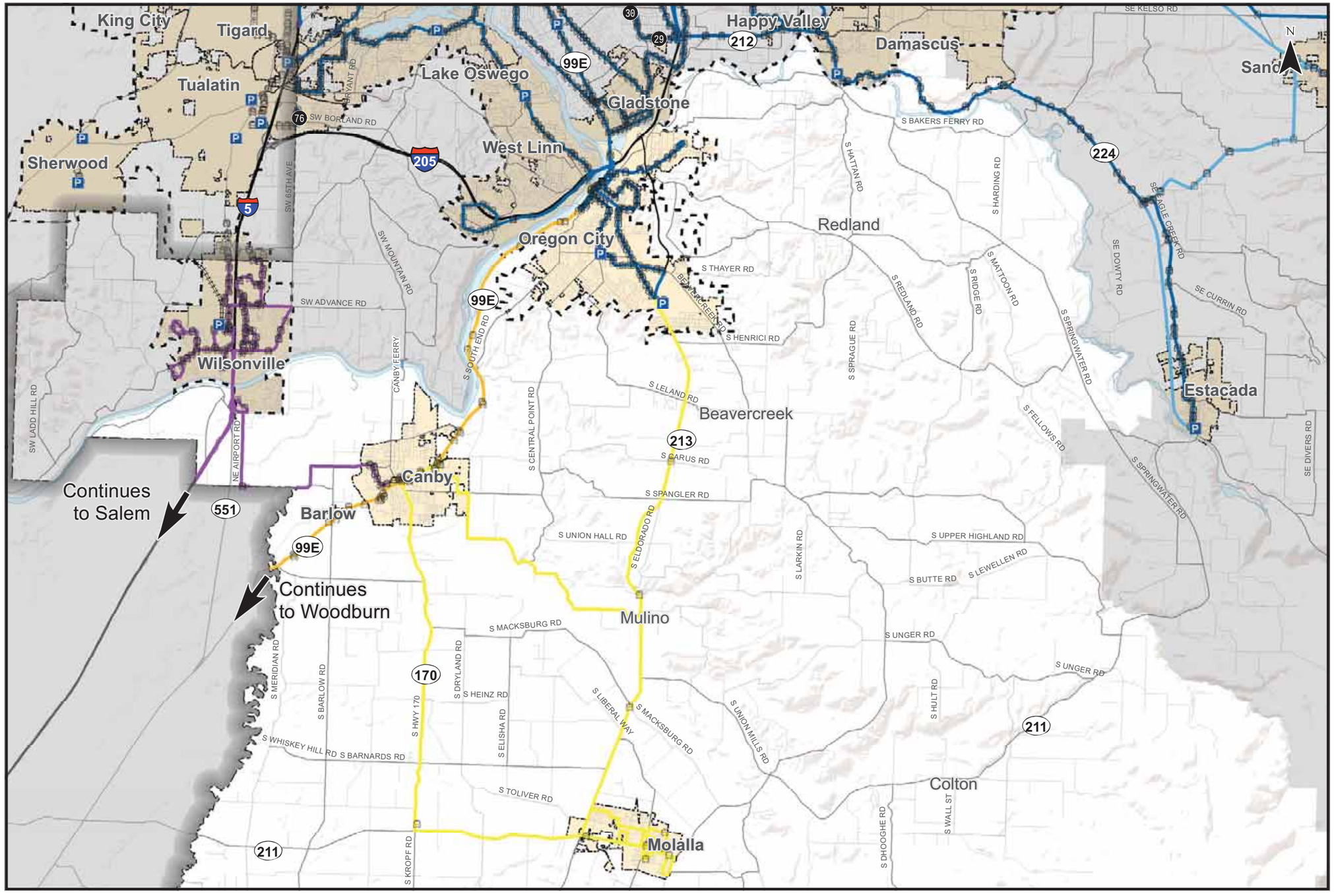
Bus Transit Providers

- Tri-Met
- SAM
- SCTD
- CAT
- MXT
- SMART

Tri-Met Rails

- MAX
- WES

- Incorporated Areas
- County Boundary
- UGB



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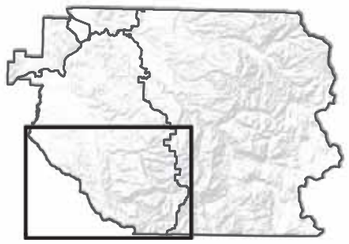
Transit Service
Southwest County - Northern Portion

Figure
SN 20

CLACKAMAS COUNTY TRANSPORTATION SYSTEM PLAN Update



- Bus Stops
- Route Number
- Park & Ride

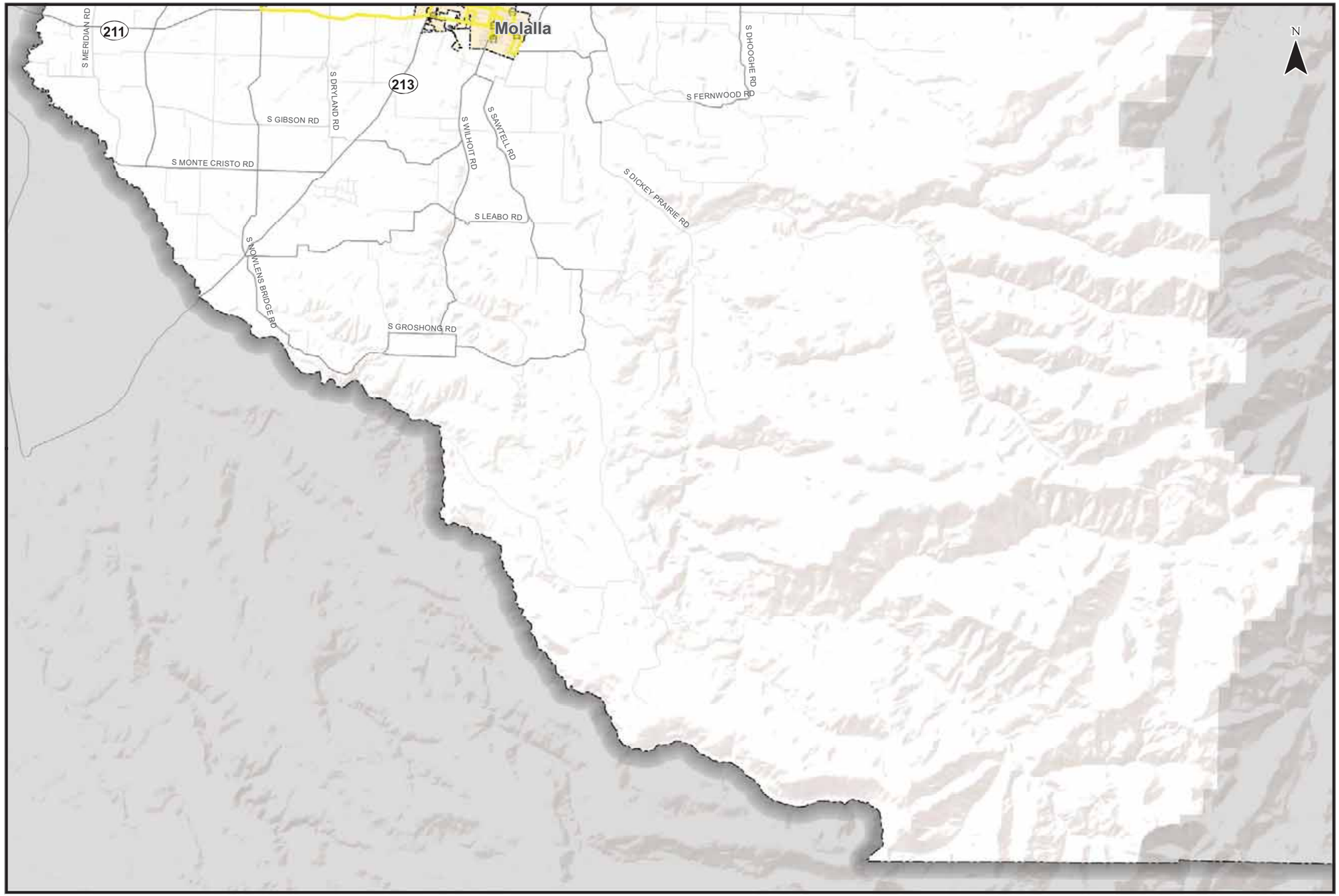
Bus Transit Providers

- Tri-Met
- SAM
- SCTD
- CAT
- MXT
- SMART

Tri-Met Rails

- MAX
- WES

- Incorporated Areas
- County Boundary
- UGB



0 1 2 3 4 Miles

Coordinate System:
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Data Source:
Clackamas County, Metro Data Resouce Center

Transit Service
Southwest County - Southern Portion

Figure
SS 20

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South Clackamas Transportation District

South Clackamas Transportation District (SCTD) operates three fixed-route bus lines within Southwest County, including Molalla to Clackamas Community College, Intra City Bus Route, and Molalla to Canby.

- Molalla to Clackamas Community College provides weekday service between the Molalla City Center and Clackamas Community College via OR 213 from 5:06 a.m. to 8:25 p.m. on approximately 30-60 minute headways. *Molalla to Clackamas Community College connects to TriMet Lines 32, 33, and 99 at Clackamas Community College.*
- Intra City Bus Route provides weekday service within the Molalla City Center from 7:30 a.m. to 5:35 p.m. on approximately 60 minute headways.
- Molalla to Canby is a weekday loop service that operates from the Molalla City Center to the Canby Transit Center to the Mulino City Center and back, from 7:30 a.m. to 5:15 p.m. on approximately 60-90 minute headways. *Molalla to Canby connects to SMART's Line 3 and CAT's Orange Line at the Canby Transit Center.*

South Metro Area Regional Transit

South Metro Area Regional Transit (SMART) operates one fixed-route bus line within Southwest County. Line 3 provides weekday rush-hour service between SMART Central at Wilsonville Station to the Canby Transit Center from 5:55 a.m. to 7:23 p.m. on approximately 60 minute headways. *Line 3 connects to the six other SMART routes at SMART Central as well as TriMet's WES Commuter Rail, Cherriots, and CAT's Orange Line.*

Canby Area Transit

Canby Area Transit (CAT) operates one-fixed route bus line within Southwest County. The Orange Line provides weekday service between the Oregon City Transit Center and the Woodburn City Center via OR 99E and the Canby Transit Center from 5:15 a.m. to 8:30 p.m. on approximately 60 minute headways during the morning, mid-day, and evening peak time periods. *The Orange line connects to TriMet at the Oregon City Transit Center.* CAT also provides a neighborhood shuttle service that operates within Canby, Monday through Friday during the morning and evening peak time periods.

Dial-A-Ride Service

TriMet provides dial-a-ride service to residents who are unable to use regular fixed-route services due to disabilities or disabling health conditions. The service is offered within three-fourths of a mile beyond the outermost portions of TriMet's bus and light-rail lines. Service is not offered outside TriMet's service district. This service is available 4:30 a.m. to 2:30 a.m. seven days a week.

Canby Area Transit provides dial-a-ride service to anyone traveling to or from destinations within the Canby Urban Growth Boundary. The service is provided Monday through Friday from 6:00 a.m. to 8:00 p.m. by reservation.

Other Additional Service

The Canby Ferry – M.J. Lee

The Canby Ferry crosses the Willamette River between Canby and Wilsonville from 6:45 a.m. to 9:15 p.m., seven days a week whenever there is a vehicle to transport. The ferry has space for up to six vehicles, but also accommodates pedestrians, bicyclists, and motorcyclists.

Park/Ride

There are currently four park/rides that provide people from outlying areas with a place to park their cars and ride transit. Two of the facilities are located in Oregon City and two are located in or near Canby.

- Within Oregon City, the Clackamas Community College (CCC) Park/Ride provides a total of 40 parking spaces and is served by TriMet Lines 32, 33, and 99 as well as SCDT's Molalla to Clackamas Community College Line. It is available to transit riders seven days a week, 24 hours a day.
- Also within Oregon City, the First Presbyterian Church Park/Ride provides a total of 21 parking spaces and is served by TriMet Line 33.
- The two park/rides in or near Canby are located at the Christian and New Life Foursquare churches. Additional information related to these park/rides is not available at this time.

Transit Level-of-Service

The transit level-of-service analysis provided below is based on the methodology described in *TCRP Report 100: Transit Capacity and Quality of Service Manual*. Refer to the Methodology/Approach section for additional information about the level-of-service measures included in the analysis.

Service Frequency

Service frequencies differ by service provider and by route.. Table S 5 summarizes the transit level-of-service analysis results for service frequency. As shown, a majority of existing services currently operate at LOS D or below through the day.

Table S 5 Service Frequency Level-of-Service Analysis – Southwest County

Provider	Routes	Service Frequency (Min)	LOS
TriMet	Line 32	30-60 minutes[1]	LOS D - LOS E
TriMet	Line 33	15-30 minutes[1]	LOS C - LOS D
TriMet	Line 99	15-30 minutes[2]	LOS C - LOS D
SCTD	Molalla to CCC	30-60 minutes[1]	LOS D - LOS E
SCTD	Intra City Bus	60 minute[2]	LOS E
SCTD	Molalla to Canby	60-90 minute[2]	LOS E - LOS F
SMART	Line 3	60 minute[2]	LOS E
CAT	Orange Line	30-60 minutes[2]	LOS D - LOS E

1. Service is less frequent on Saturday or Sunday.
2. No service is provided on Saturday or Sunday.

Hours of Service

The total number of hours transit service is provided differs by service provider and by route. Table S 6 summarizes the transit level-of-service analysis results for hours of service. As shown, a majority of existing services currently operate at LOS D or below.

Table S 6 Hours of Service Level-of-Service Analysis – Southwest County

Provider	Routes	Hours of Service	LOS
TriMet	Line 32	12 hours	LOS D
TriMet	Line 33	20 hours	LOS A
TriMet	Line 99	4 hours	LOS E
SCTD	Molalla to CCC	15 hours	LOS C
SCTD	Intra City Bus	9 hours	LOS E
SCTD	Molalla to Canby	10 hours	LOS E
SMART	Line 3	13 hours	LOS D
CAT	Orange Line	15 hours	LOS C

1. Service is less frequent on Saturday or Sunday.
2. No service is provided on Saturday or Sunday.

Service Coverage

Figure S 21 displays the existing transit level-of-service analysis results for service coverage. Areas defined as transit supportive that have service are shown in green. Areas defined as transit supportive that are lacking service are shown in red. Areas that have transit service, but do not qualify as a TSA, are shown in orange. A majority of the areas shown in red would require additional transit routes or the development of new pathway connections (increasing the amount of area accessible by a ¼ mile walk) to existing transit routes in order to be served.

The percentage of TSA's served within Southwest County and the corresponding level of service has been identified using the Transit Level of Service (TLOS) methodology. As shown in Table S 7, the percent of transit supportive population areas served is 57 percent and the percent of transit supportive employment areas served is 56 percent. The corresponding LOS is E.

Table S 7 Service Coverage Analysis – Southwest County

Area Type	Population	Employment
Transit Supportive Areas (TSA)[1]	10,982	11,472
Transit Supportive Areas Served[2]	6,311	6,465
Percent TSA Served by Transit	57%	56%
Level of Service	LOS E	LOS E
Transit Supportive Areas without service	4,671	5,007
Transit Area Served[3]	11,765	7,863
Additional Areas Served	5,454	1,398

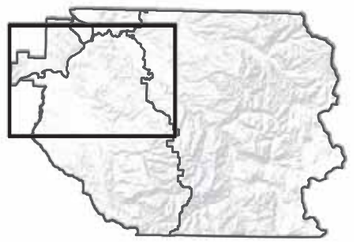
1. Area shown in green and red in Figure S 21.
2. Area shown in green in Figure S 21.
3. Area shown in green and orange in Figure S21.

As shown in Table S 7, 4,671 people and 5,007 jobs are located within TSA's that do not have transit service. These areas currently have a population and/or employment density that can support transit service and therefore should be included in future efforts to improve service routes and stop locations. Also shown in Table S 7, 11,765 people and 7,863 jobs are currently served by transit. Of the total area served, 5,454 people and 1,398 jobs are located within areas that have transit service, but currently do not have the population and/or job density necessary to economically support transit service. A few of the areas in Oregon City, Molalla, and Canby city centers, however, are shown in Figure S 9 as containing a large portion of the transportation disadvantaged population within Southwest Clackamas and therefore, the service provided in these areas is an important part of the community.

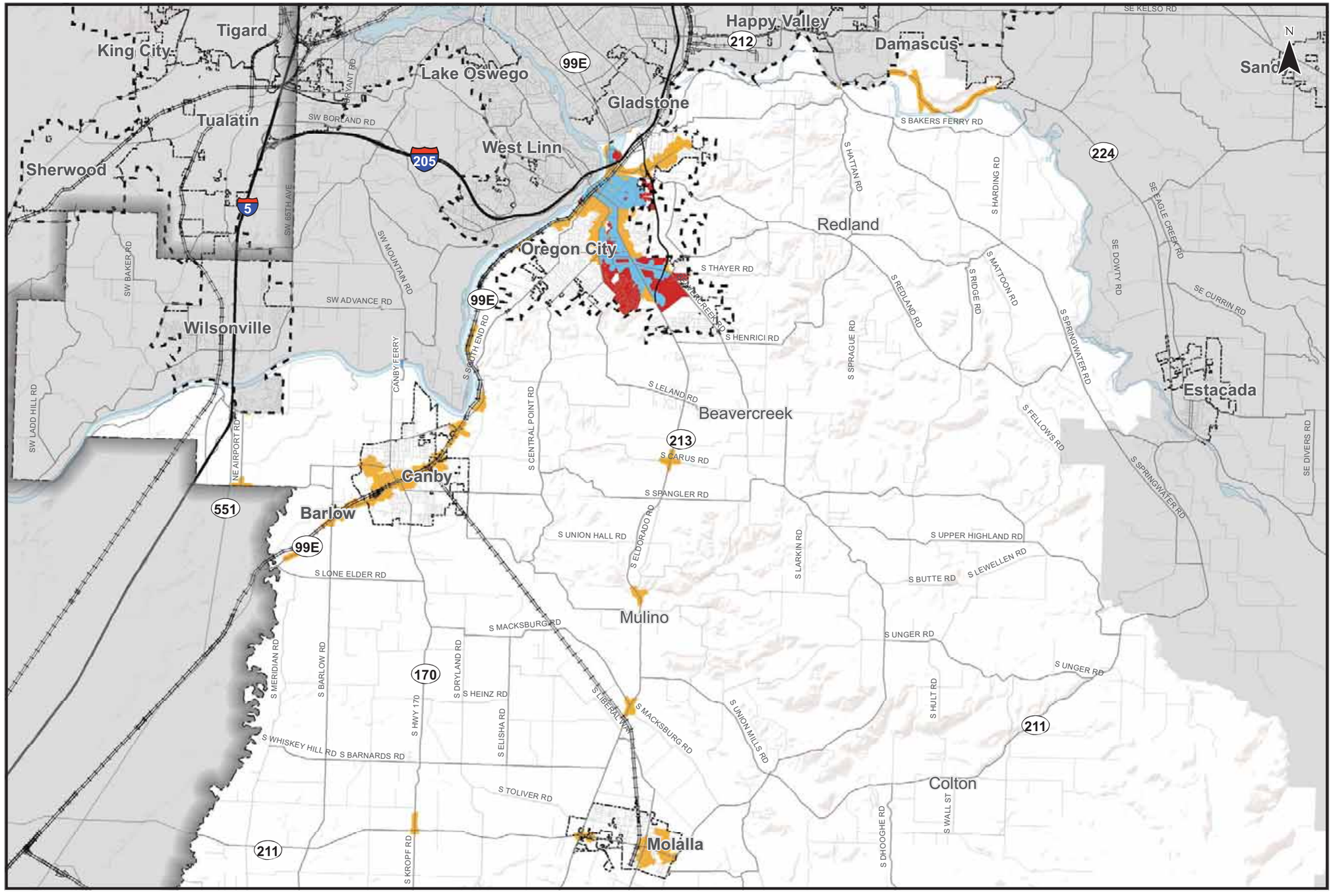
Future Transit Service Coverage

The future transit level-of-service analysis assumes that existing service frequencies, service hours, and service coverage is the same in the future. The only difference is the population and employment growth assumptions included in the regional traffic model and the resulting transit supportive areas and transit supportive areas served. Figure S 22 displays the transit level-of-service analysis results for service coverage. As shown, the number of transit supportive areas is expected to increase throughout most of Southwest County. While many of these areas are expected to be served by existing transit services, the remaining areas will require additional service routes or connections to existing routes in order to be served.

CLACKAMAS COUNTY TRANSPORTATION SYSTEM PLAN Update



- Transit Supportive Areas Served
- Transit Supportive Areas
- Transit Service Areas
- Incorporated Areas
- County Boundary
- UGB



0 1 2 3 4 Miles

Coordinate System:
NAD 1983 HARN StatePlane Oregon North FIPS 3601 Feet Intl
Data Source:
Clackamas County, Metro Data Resouce Center

Existing Transit Supportive Areas
Southwest County - Northern Portion

Figure
SN 21

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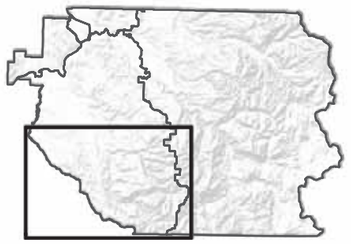
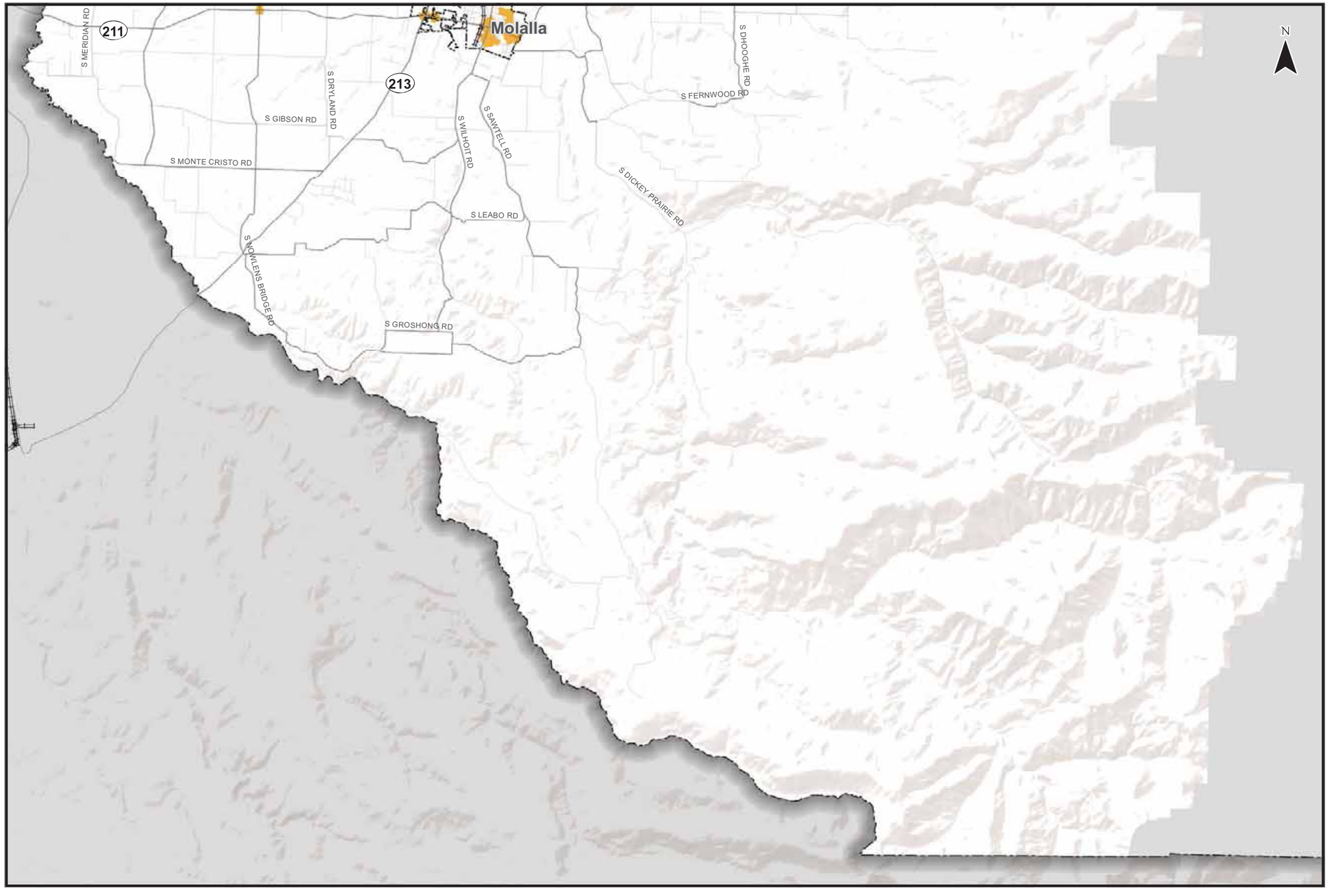
CLACKAMAS COUNTY Transportation System Plan Update



- Transit Supportive Areas Served
- Transit Supportive Areas
- Transit Service Areas
- Incorporated Areas
- County Boundary
- UGB



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Coordinate System:
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Data Source:
Clackamas County, Metro Data Resouce Center

Existing Transit Supportive Areas
Southwest County - Southern Portion

Figure
SS 21

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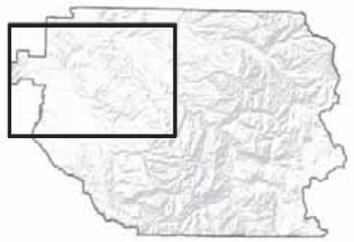
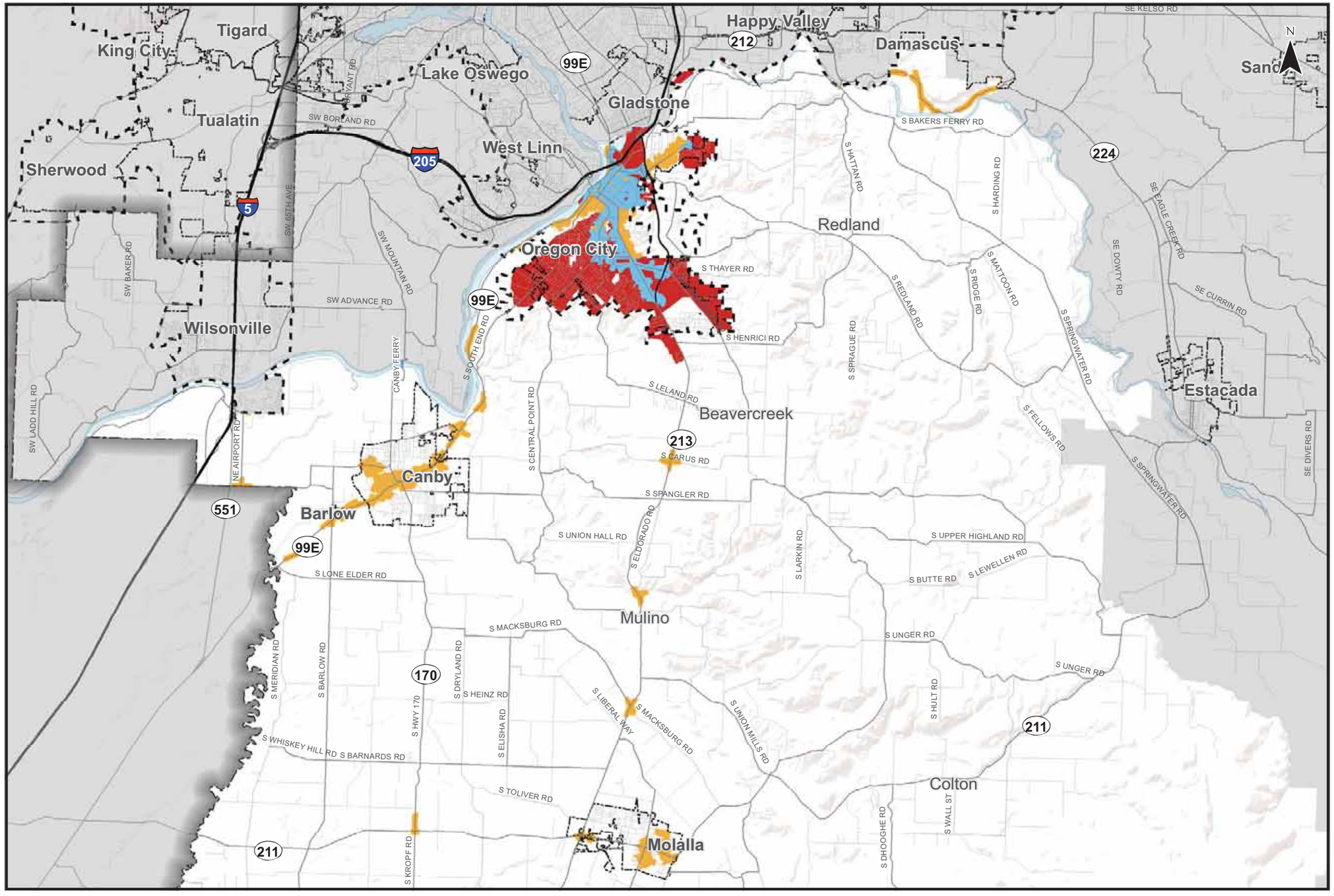
CLACKAMAS COUNTY TRANSPORTATION SYSTEM PLAN Update



- Transit Supportive Areas Served
- Transit Supportive Areas
- Transit Service Areas
- Incorporated Areas
- County Boundary
- UGB



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Coordinate System:
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Data Source:
Clackamas County, Metro Data Resouce Center

Future Transit Supportive Areas
Southwest County - Northern Portion

Figure
SN 22

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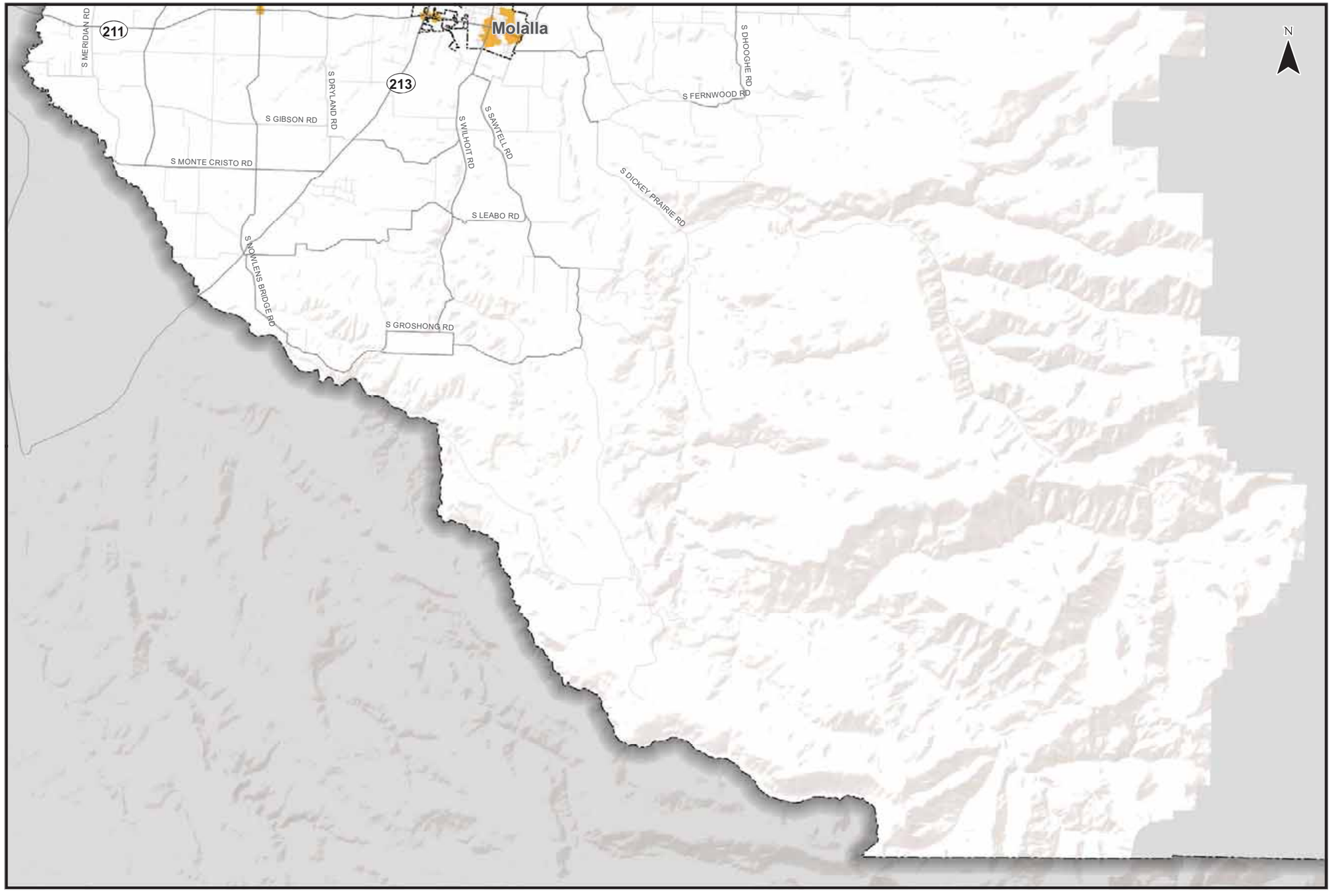
CLACKAMAS COUNTY TRANSPORTATION SYSTEM PLAN Update

- Transit Supportive Areas Served
- Transit Supportive Areas
- Transit Service Areas
- Incorporated Areas
- County Boundary
- UGB



0 1 2 3 4 Miles

Coordinate System:
NAD 1983 HARN StatePlane Oregon North FIPS 3601 Feet Intl
Data Source:
Clackamas County, Metro Data Resouce Center

Future Transit Supportive Areas
Southwest County - Southern Portion

Figure
SS 22

H:\proj\lie\11732 - Clackamas County TSP\gis\11x17 Maps\22 Future Transit Supportive Areas.mxd

CRASH ANALYSIS

The existing conditions crash analysis considered: 1) Locations within the County identified as safety priorities by the Oregon Department of Transportation; 2) Primary crash types contributing to the majority of serious injury and fatal crashes in the County; and 3) Specific safety focus intersections identified by County staff. See *Section 3 Assumptions and Methods* for a description of the crash analysis methodology.

Figure S 23 below illustrates the reported crashes in the Southwest County from 2007 through 2010. The following sub-sections take a closer look at the reported crash data to identify historic trends and patterns that have contributed to the majority of fatal and serious injury crashes.

Statewide Safety Priority Locations

ODOT identifies top safety priority locations annually using a Statewide Priority Index System (SPIS). The locations in the top 5% and 10% are those that have historically experienced a higher number and/or higher severity of crashes. These locations are referred to as SPIS locations or SPIS sites. Clackamas County applies the same methodology as ODOT to County roadways to identify the top 20 to 25 locations on which to focus safety reviews and improvements. Figure S 24 illustrates the locations of the statewide safety priority locations as well as the County's safety priority locations.

There are several SPIS locations within the Southwest County area. These include portions of OR 99E in Oregon City, Canby and Barlow. Also included are portions of OR 213 in Oregon City, Mulino and Molalla; and a portion of OR 211 near Molalla. Forthcoming TSP update reports will explore potential projects, studies, programs and/or policies to reduce crashes at these locations.

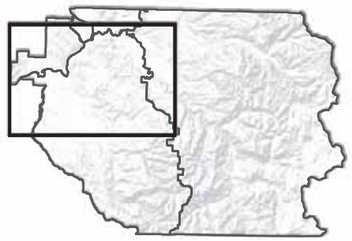
Primary Crash Types Contributing to Serious Injury and Fatal Crashes

The following sub-sections and figures display the locations of the crash types that historically have led to the majority of serious injury and fatal crashes in the County as discussed in *Section 3 Methodology & Approach*:

- Roadway Departure Crashes;
- Crashes Involving Young Drivers (ages 15 through 25 years old); and
- Crashes Involving Aggressive Driving (driving too fast, following too close).

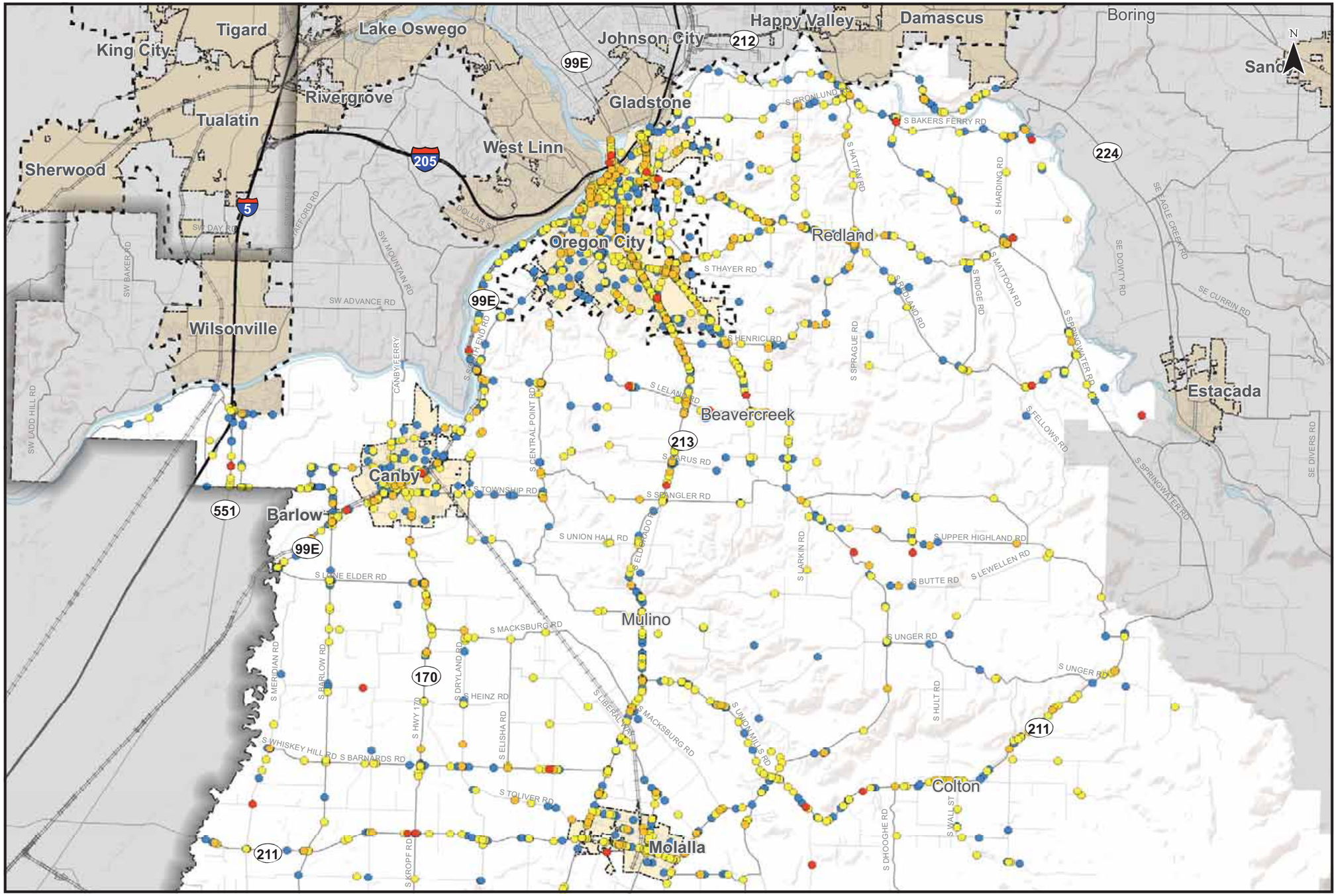
In addition to the three crash types above, crashes involving pedestrians and bicyclists are also considered. While the overall occurrence of crashes involving pedestrians and bicyclists may not be as high as other crash types, when those crashes do occur they often result in serious injuries or fatalities because pedestrians and bicyclists are more vulnerable than people traveling in motorized vehicles.

CLACKAMAS COUNTY TRANSPORTATION SYSTEM PLAN Update



Reported Crashes
2007 Through 2010

- Fatal Crash
- Serious Injury Crash
- Minor Injury Crash
- PDO Crash
- Incorporated Areas
- County Boundary
- UGB



0 1 2 3 4 Miles

Coordinate System:
NAD 1983 HARN StatePlane Oregon North FIPS 3601 Feet Intl
Data Source:
Clackamas County, Metro Data Resouce Center,
Oregon Department of Transportation

Reported Crashes 2007-2010
Southwest County - Northern Portion

Figure
SN 23

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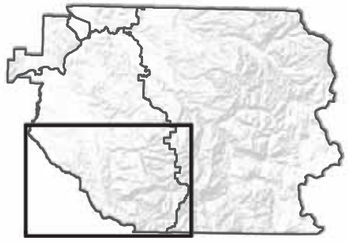
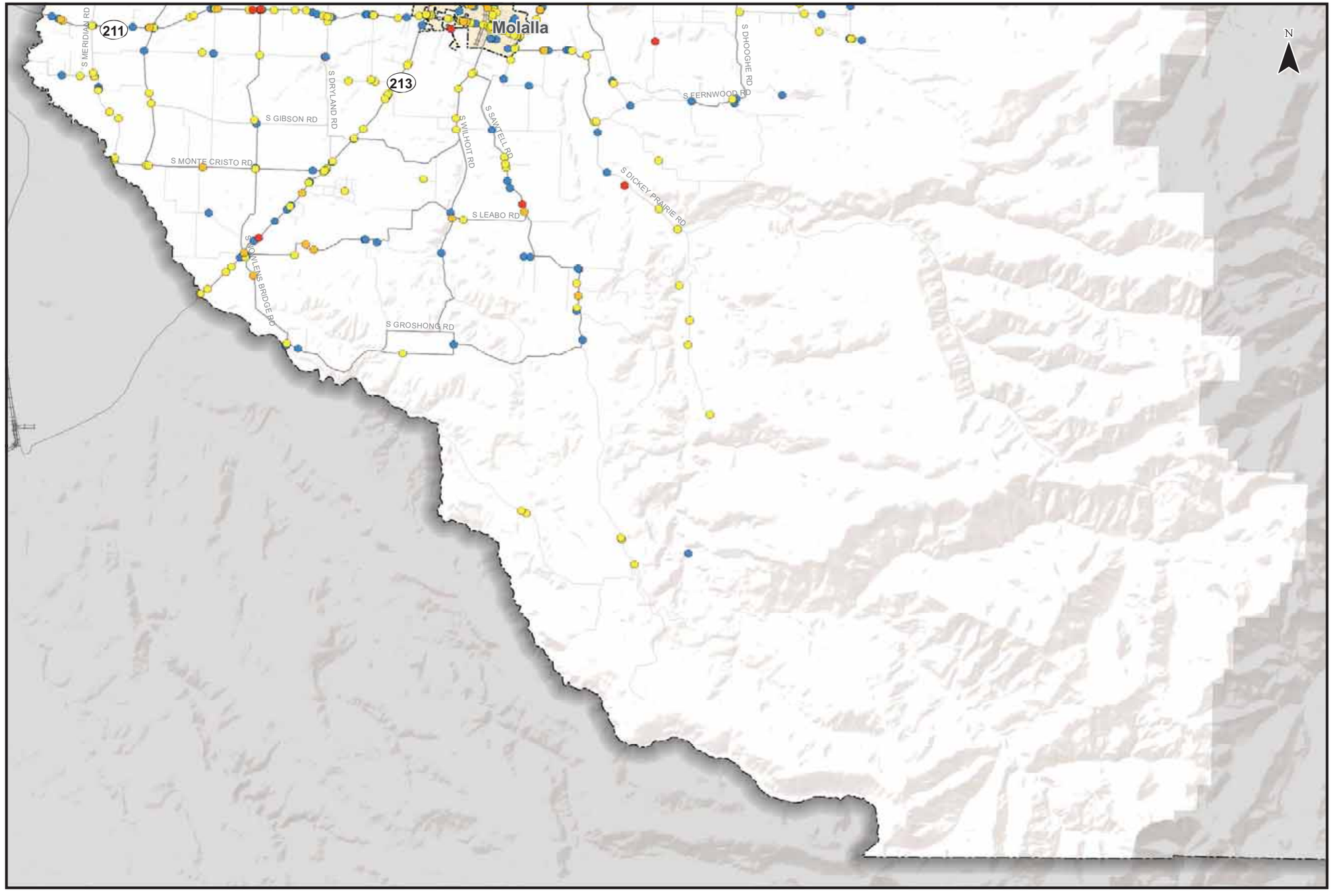
CLACKAMAS COUNTY TRANSPORTATION SYSTEM PLAN *Update*



Reported Crashes
2007 Through 2010

- Fatal Crash
- Serious Injury Crash
- Minor Injury Crash
- PDO Crash
- Incorporated Areas
- County Boundary
- UGB



0 1 2 3 4 Miles

Coordinate System:
NAD 1983 HARN StatePlane Oregon North FIPS 3601 Feet Intl
Data Source:
Clackamas County, Metro Data Resouce Center,
Oregon Department of Transportation

Reported Crashes 2007-2010
Southwest County - Southern Portion

Figure
SS 23

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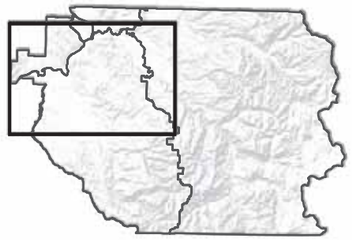
CLACKAMAS COUNTY TRANSPORTATION SYSTEM PLAN Update



County SPIS Sites

ODOT SPIS Sites

- 5% Site
- 10% Site

Functional Classifications

- Freeway
- Expressway
- Major Arterial
- Minor Arterial
- Collector
- Connector
- Local
- Forest Service Paved
- Forest Aggregate Road
- General dirt, road or trail
- Other
- Railroad
- Incorporated Areas
- County Boundary
- UGB

On an annual basis, the Oregon Department of Transportation identifies safety priority locations through their Statewide Priority Index System (SPIS). The SPIS process identifies locations for review and potential improvements based on their crash history. SPIS locations listed in the top 5% and top 10% represent locations that have historically experienced a higher number and/or higher severity of crashes than other locations in the state.

0 1 2 3 4 Miles

Coordinate System:
NAD 1983 HARN StatePlane Oregon North FIPS 3601 Feet Intl
Data Source:
Clackamas County, Metro Data Resouce Center

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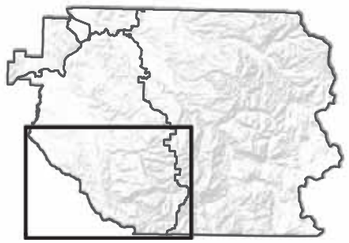
Statewide Priority Index System Locations
Southwest County - Northern Portion

Figure
SN 24

CLACKAMAS COUNTY TRANSPORTATION SYSTEM PLAN *Update*



County SPIS Sites

ODOT SPIS Sites

- 5% Site
- 10% Site

Functional Classifications

- Freeway
- Expressway
- Major Arterial
- Minor Arterial
- Collector
- Connector
- Local
- Forest Service Paved
- Forest Aggregate Road
- General dirt, road or trail
- Other
- Railroad
- Incorporated Areas
- County Boundary
- UGB

On an annual basis, the Oregon Department of Transportation identifies safety priority locations through their Statewide Priority Index System (SPIS). The SPIS process identifies locations for review and potential improvements based on their crash history. SPIS locations listed in the top 5% and top 10% represent locations that have historically experienced a higher number and/or higher severity of crashes than other locations in the state.

0 1 2 3 4 Miles

Coordinate System:
NAD 1983 HARN StatePlane Oregon North FIPS 3601 Feet Intl
Data Source:
Clackamas County, Metro Data Resouce Center

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Statewide Priority Index System Locations
Southwest County - Southern Portion

Figure
SS 24

The purpose of this assessment is to identify candidate safety corridors for the County to study and evaluate in greater detail. A candidate safety corridor is a series of roadway segments and intersections that have experienced higher frequencies of roadway departure crashes, crashes involving young drivers, and crashes involving aggressive driving. Those three crash types have historically contributed to the majority of fatal and injury crashes in the County. From the analysis presented below, the follow corridors (listed in no particular order) in Southwest County Area emerged as candidate safety corridors:

1. S Redland Road from OR 213 to S Hattan Road
2. OR 213 from Molalla Avenue to S Spangler Road
3. OR 213 from S Graves Road to OR 211
4. S Maple Lane Road from Beavercreek Road to Ferguson Road
5. S Beavercreek Road from S Lower Highland Road to S Butte Road
6. S Upper Highland Road from S Beavercreek Road to S Lower Highland Road
7. OR 211 from S Beavercreek Road to S Upper Highland Road
8. OR 99E from S Sequoia Parkway to S Lone Elder Road
9. OR 99E from NE Territorial Road to the Urban Growth Boundary
10. OR 170 from OR 99E to S Macksburg Road
11. OR 213/S Beavercreek Road Intersection
12. Redland Road/S Springwater Road Intersection

A few of the corridors identified above extend into incorporated areas; collaboration with partner agencies may be needed to study those corridors. Potential corridors completely within an incorporated area are not identified here because they are considered the responsibility of the corresponding city.

Figure S 25 illustrates the location of the candidate safety corridors in the unincorporated areas of Southwest County.

Roadway Departure Crashes, Crashes Involving Young Drivers, and Crashes Involving Aggressive Driving

Roadway departure crashes, crashes involving young drivers and crashes involving aggressive driving were mapped in two ways. First, each crash type was mapped and assessed separately to identify corridors where each crash type has occurred. Second, the serious injury and fatal crashes for each of those crash types were also mapped together to consider where the crash types overlap and focus attention on serious injury and fatal crashes. The results of both mapping exercises informed the candidate safety corridors listed above.

Figure S 26 illustrates the roadway departure crashes in Southwest County. The roadway departure crashes have occurred on OR 99E, OR 211, OR 213, and S Redland Road. The portions of these facilities with a higher frequency of serious injury and fatal crashes are included in the candidate safety corridors listed above.

Figure S 27 illustrates the crashes involving young drivers in Southwest County. Young drivers are defined as drivers age 15 through 25 years old. The location of these crashes reinforces the candidate safety corridors listed above. The areas that are most noticeable with regards to crashes involving younger drivers are along

OR 213 and Molalla Avenue in Oregon City, OR 99E in Canby area, along S Redland Road, and OR 213 in the vicinity of Mulino and Molalla.

Figure S 28 illustrates crashes involving aggressive driving. Aggressive driving includes vehicles traveling too fast for conditions, exceeding the posted speed, and following too closely. The locations of crashes involving aggressive driving reinforce the candidate safety corridors noted above particularly the OR 213, OR 211 and Highway 99E corridors.

Figure S 29 illustrates serious injury and fatal crashes that were roadway departure crashes, involved young drivers, and/or involved aggressive driving. The purpose of these figures is to help focus on the corridors where serious injury and fatal crashes have occurred. The previous figures reinforced the corridor selection based on the overall frequency of crashes. These figures help confirm the candidate safety corridors are incorporating areas with a history of serious injury or fatal crashes.

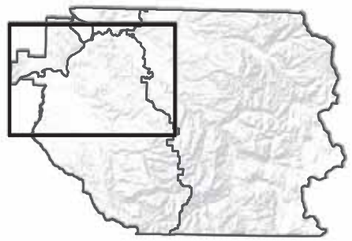
Crashes Involving Pedestrians or Bicyclists

In rural areas, crashes involving in pedestrians and bicyclists are a small proportion of total reported crashes because of the lower volumes of pedestrians and bicyclists using the roadway. These two crash types are considered here to confirm the candidate safety corridors incorporate areas where pedestrian and bicycle crashes have occurred.

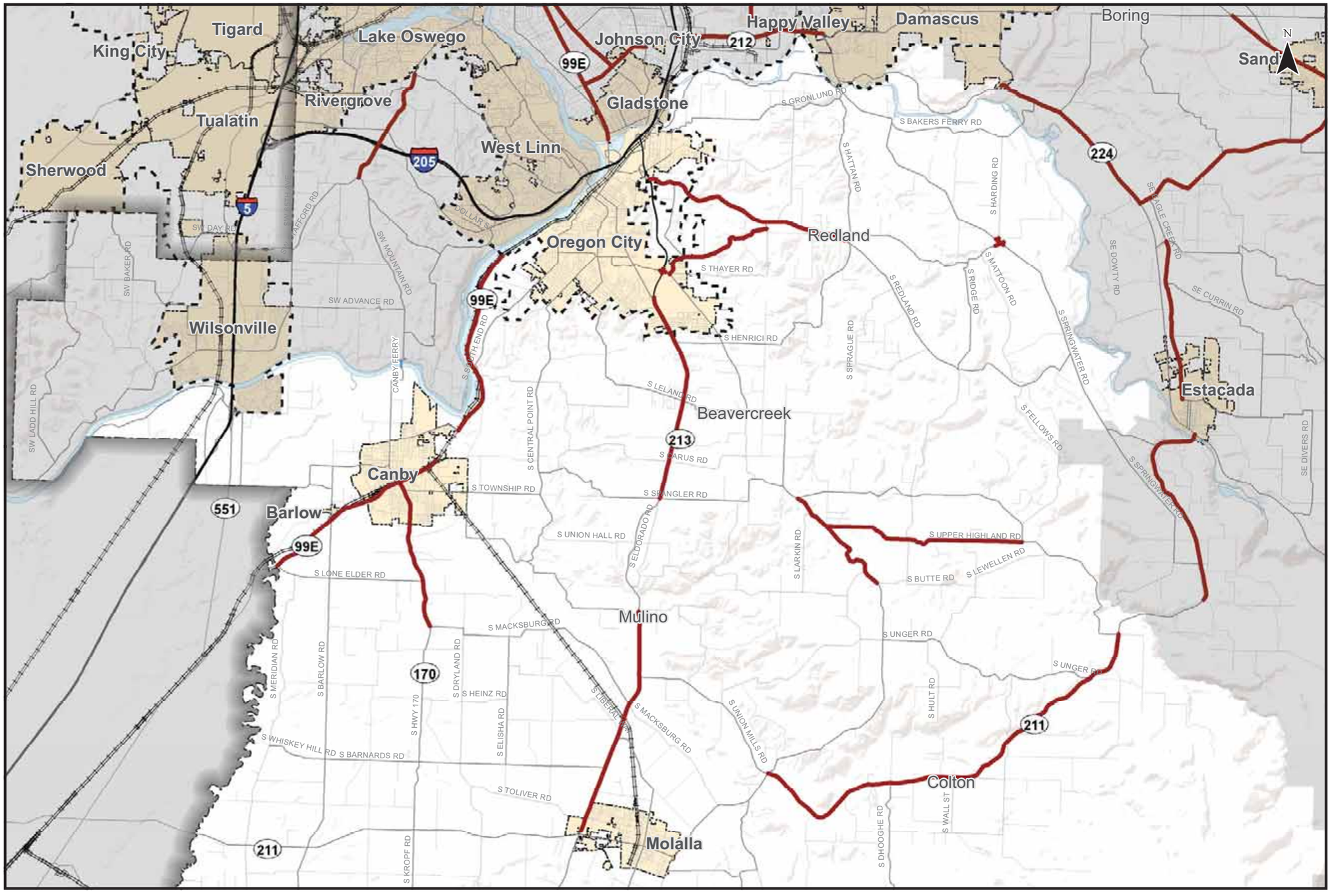
Figure S 30 and Figure S 31 illustrate crashes involving pedestrians and bicyclists.

The pedestrian and bicycle crashes within Southwest County from 2007 through 2010 have predominately occurred in the more urbanized areas of Canby and Oregon City. This is consistent with what is expected given pedestrian and bicycle activity is higher in urban areas. The primary roadways within Oregon City and Canby are included in the candidate safety corridors above.

CLACKAMAS COUNTY TRANSPORTATION SYSTEM PLAN Update



- Candidate Safety Corridors
- Incorporated Areas
- County Boundary
- UGB



0 1 2 3 4 Miles

Coordinate System:
NAD 1983 HARN StatePlane Oregon North FIPS 3601 Feet Intl
Data Source:
Clackamas County, Metro Data Resouce Center

Candidate Safety Corridors
Southwest County - Northern Portion

Figure
SN 25

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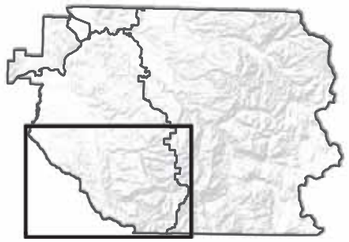
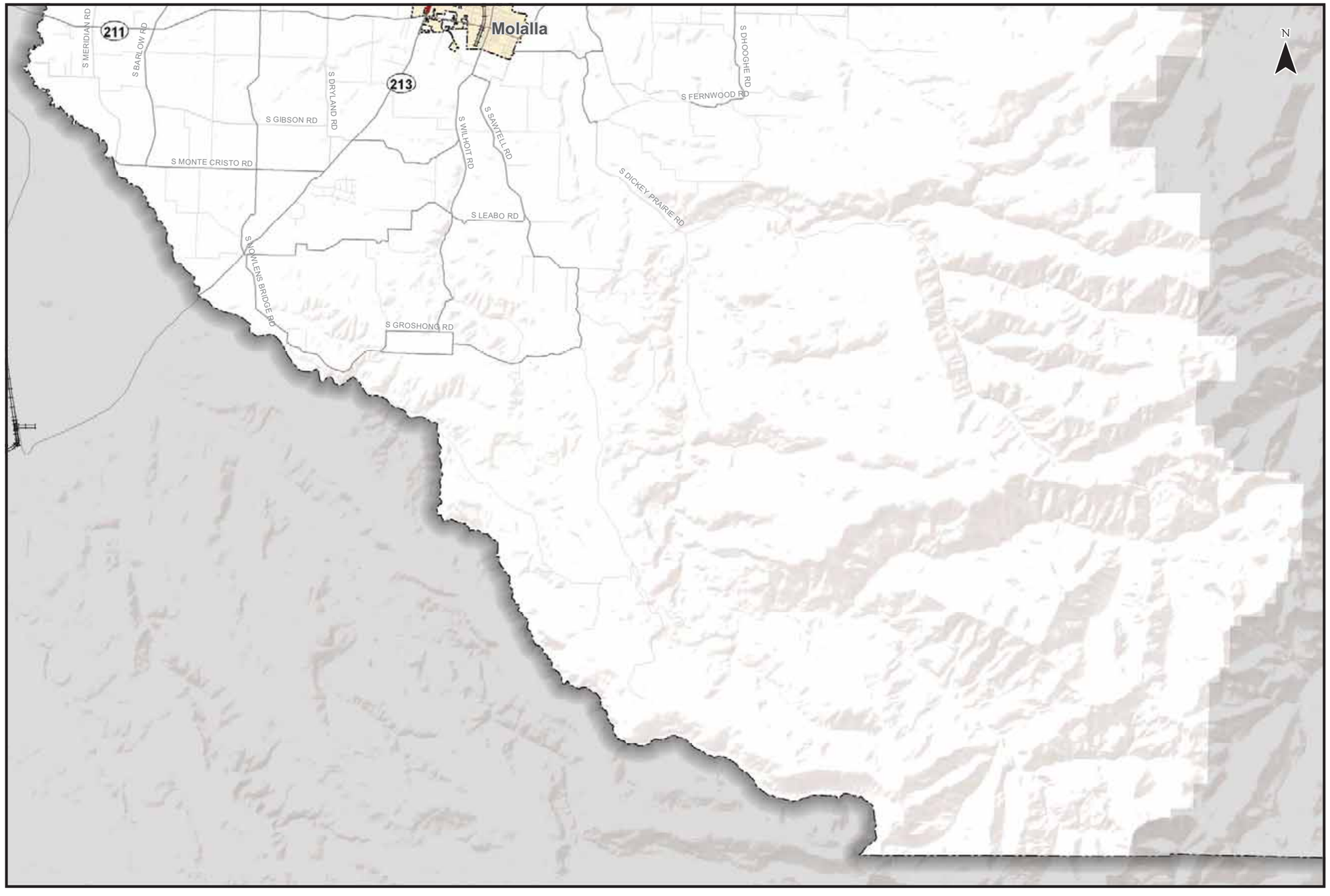
CLACKAMAS COUNTY TRANSPORTATION SYSTEM PLAN Update



- Candidate Safety Corridors
- Incorporated Areas
- County Boundary
- UGB



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Coordinate System:
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Data Source:
Clackamas County, Metro Data Resouce Center

Candidate Safety Corridors
Southwest County - Southern Portion

Figure
SS 25

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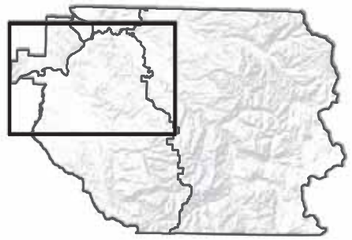
CLACKAMAS COUNTY TRANSPORTATION SYSTEM PLAN Update



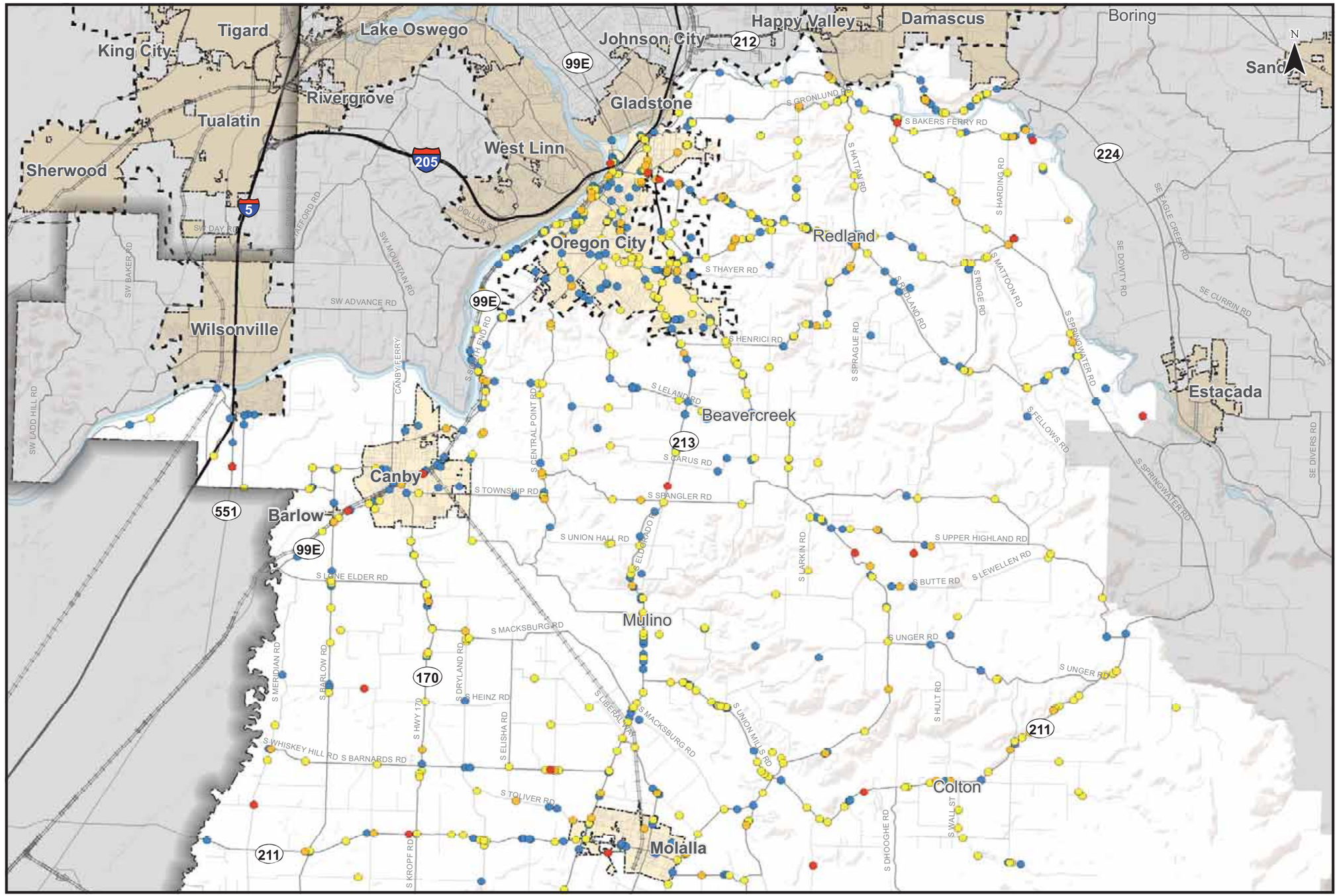
Roadway Departure Crashes

- Fatal Crash
- Serious Injury Crash
- Minor Injury Crash
- PDO Crash

Incorporated Areas

County Boundary

UGB



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Coordinate System:
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Data Source:
Clackamas County, Metro Data Resouce Center,
Oregon Department of Transportation

Roadway Departure Crashes 2007-2010
Southwest County - Northern Portion

Figure
SN 26

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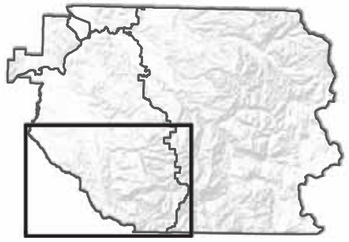
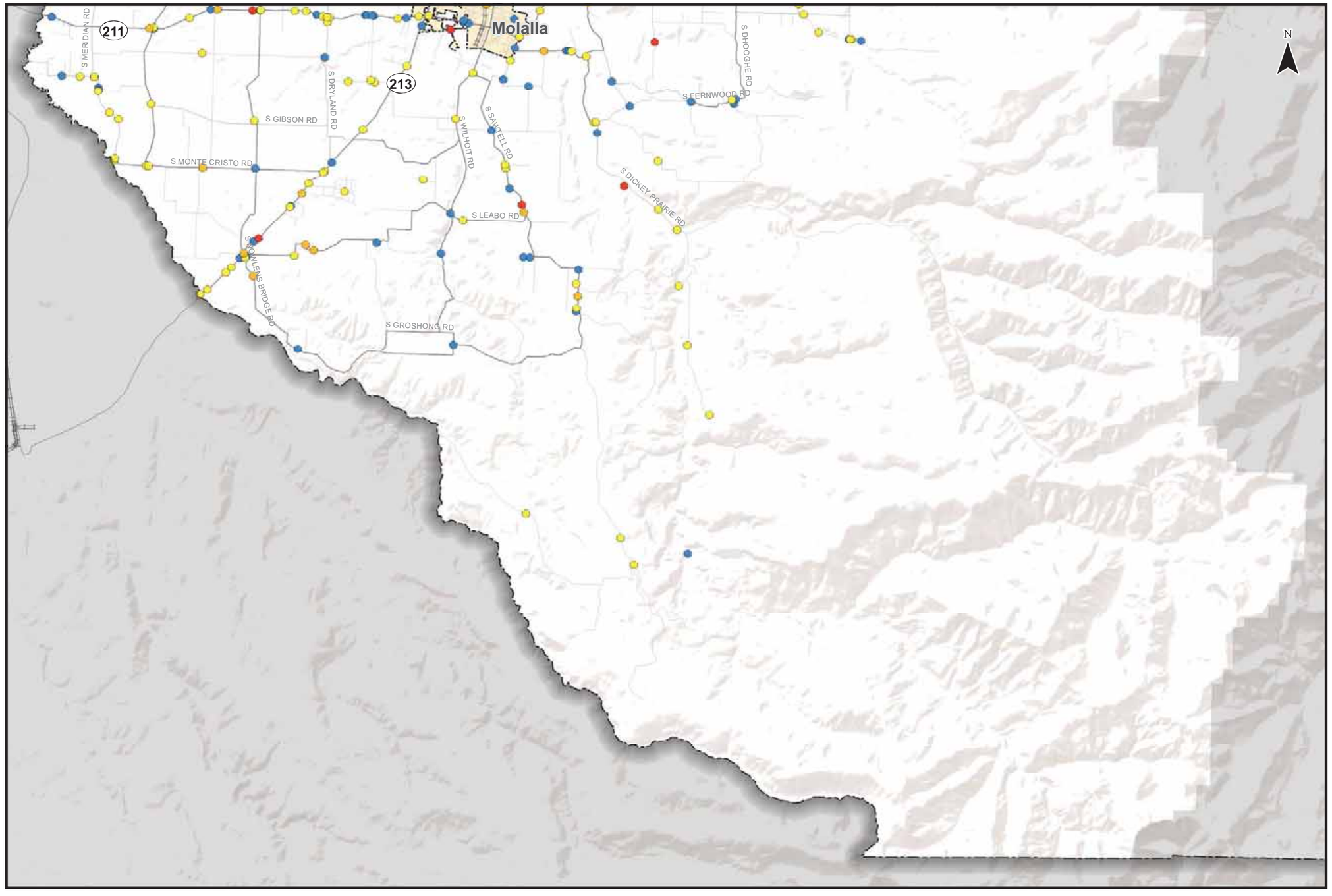
CLACKAMAS COUNTY TRANSPORTATION SYSTEM PLAN Update



Roadway Departure Crashes

- Fatal Crash
- Serious Injury Crash
- Minor Injury Crash
- PDO Crash

- Incorporated Areas
- County Boundary
- UGB



0 1 2 3 4 Miles

Coordinate System:
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Data Source:
Clackamas County, Metro Data Resouce Center,
Oregon Department of Transportation

Roadway Departure Crashes 2007-2010
Southwest County - Southern Portion

Figure
SS 26

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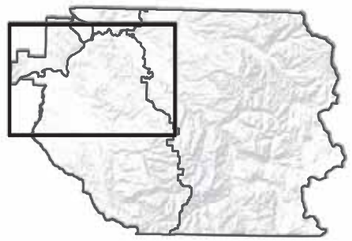
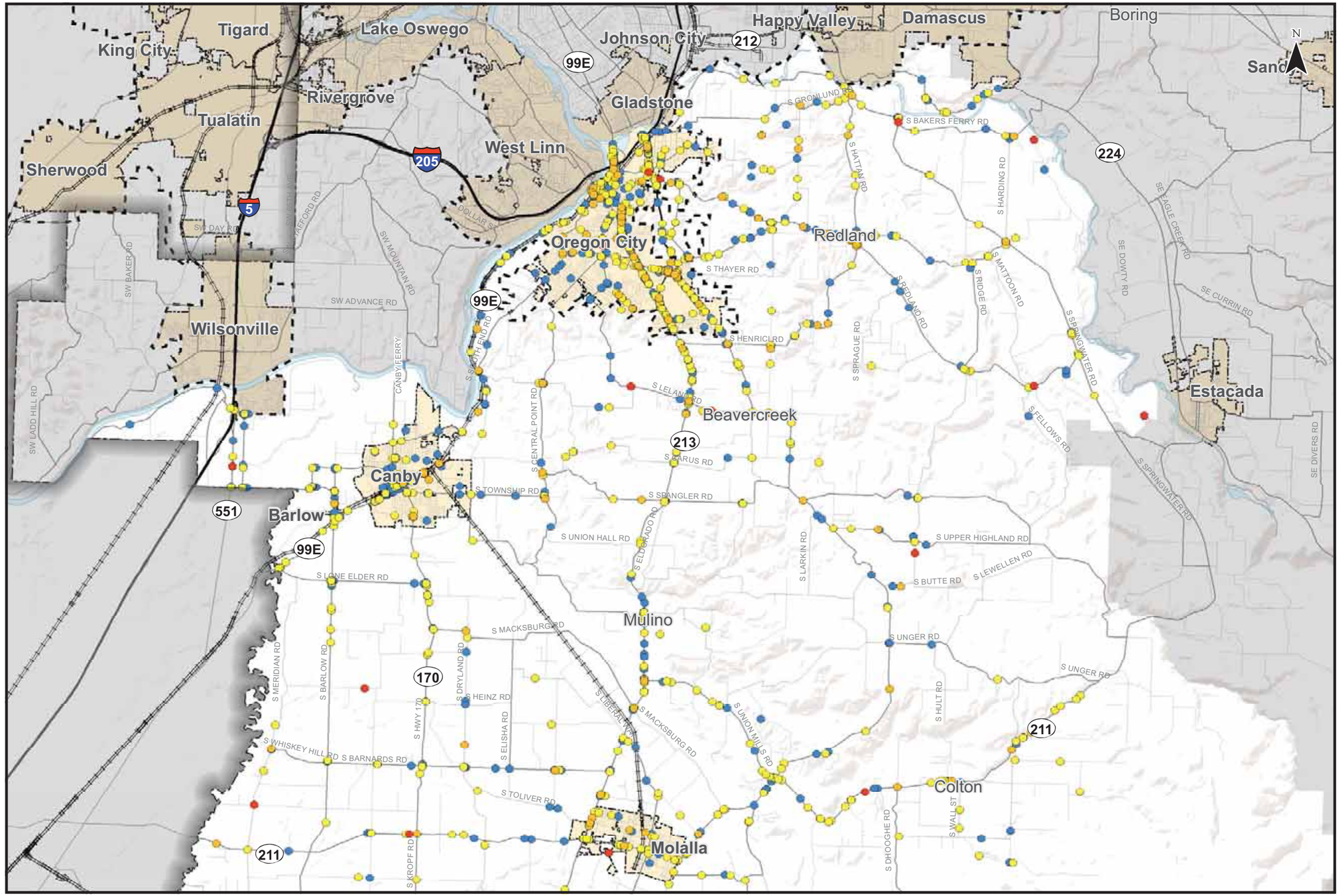
CLACKAMAS COUNTY TRANSPORTATION SYSTEM PLAN Update



Crashes Involving Young Drivers (15-25 Years Old)

- Fatal Crash
- Serious Injury Crash
- Minor Injury Crash
- PDO Crash
- Incorporated Areas
- County Boundary
- UGB



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Coordinate System:
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Data Source:
Clackamas County, Metro Data Resouce Center,
Oregon Department of Transportation

Crashes Involving Young Drivers (15-25 Years Old) 2007-2010
Southwest County - Northern Portion

Figure
SN 27

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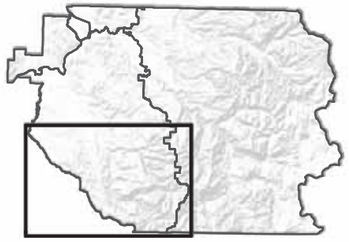
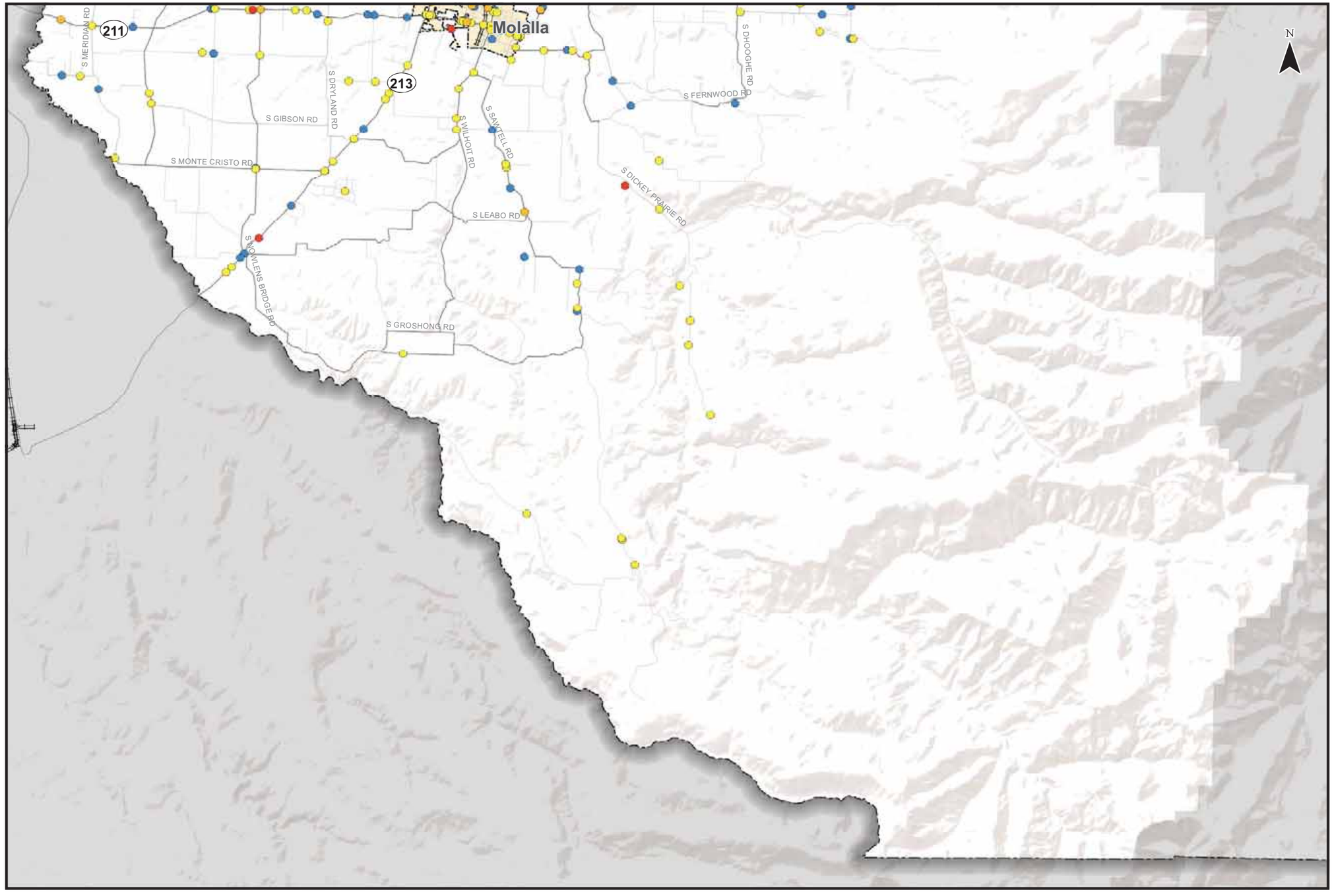
CLACKAMAS COUNTY TRANSPORTATION SYSTEM PLAN Update



Crashes Involving Young Drivers (15-25 Years Old)

- Fatal Crash
- Serious Injury Crash
- Minor Injury Crash
- PDO Crash
- Incorporated Areas
- County Boundary
- UGB



0 1 2 3 4 Miles

Coordinate System:
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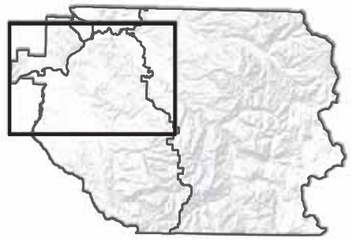
Data Source:
Clackamas County, Metro Data Resouce Center,
Oregon Department of Transportation

Crashes Involving Young Drivers (15-25 Years Old) 2007-2010
Southwest County - Southern Portion

Figure
SS 27

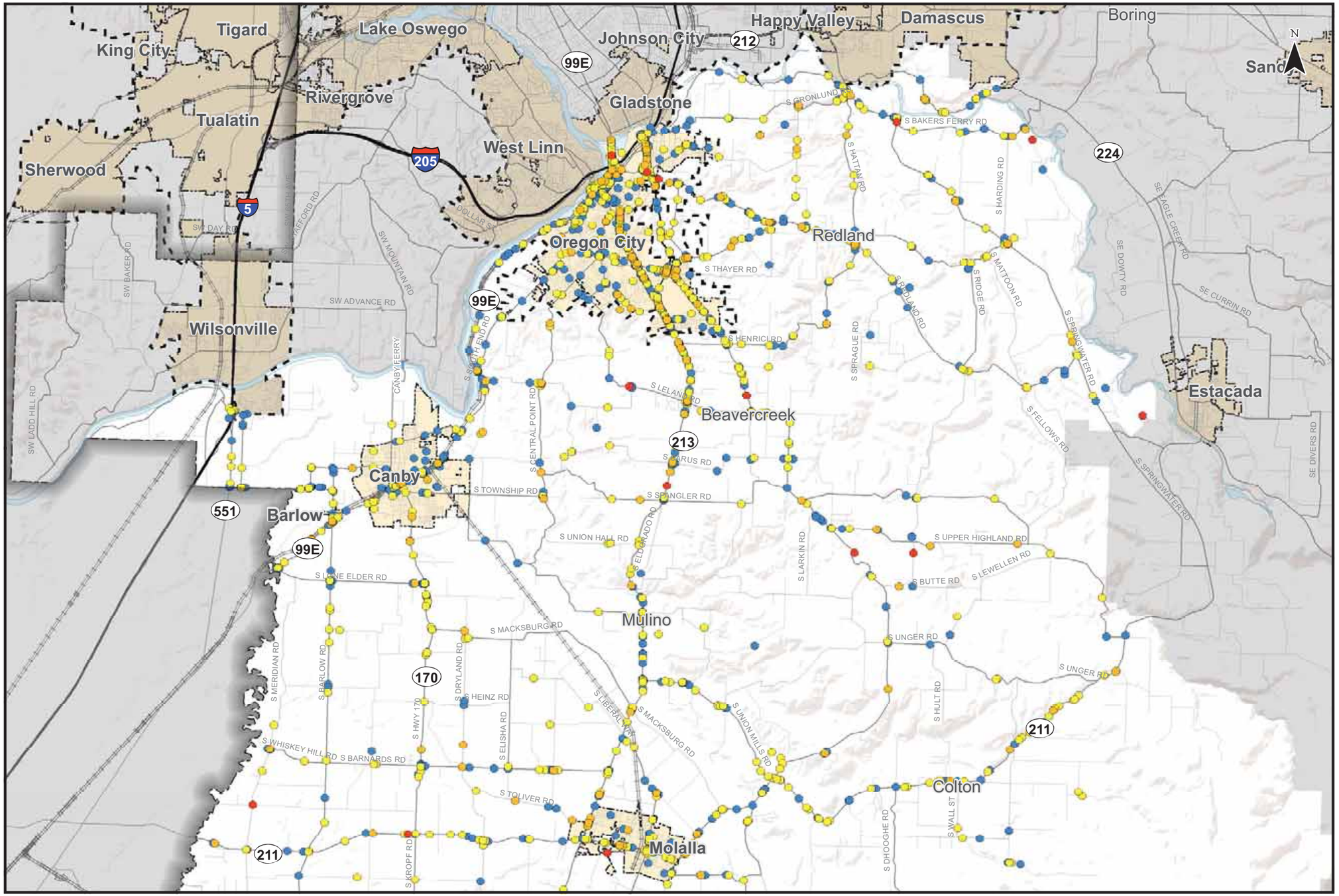
H:\proj\lie\117732 - Clackamas County TSP\gis\11x17 Maps\27 Crashes Involving Young Drivers (15-25 Years Old).mxd

CLACKAMAS COUNTY TRANSPORTATION SYSTEM PLAN Update



Crashes Involving Aggressive Driving

- Fatal Crash
- Serious Injury Crash
- Minor Injury Crash
- PDO Crash
- Incorporated Areas
- County Boundary
- UGB



0 1 2 3 4 Miles

Coordinate System:
NAD 1983 HARN StatePlane Oregon North FIPS 3601 Feet Intl
Data Source:
Clackamas County, Metro Data Resouce Center,
Oregon Department of Transportation

Crashes Involving Aggressive Driving 2007-2010
Southwest County - Northern Portion

Figure
SN 28

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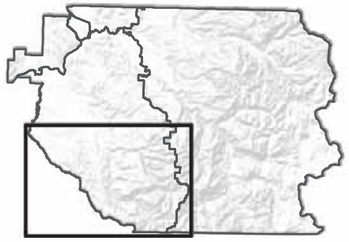
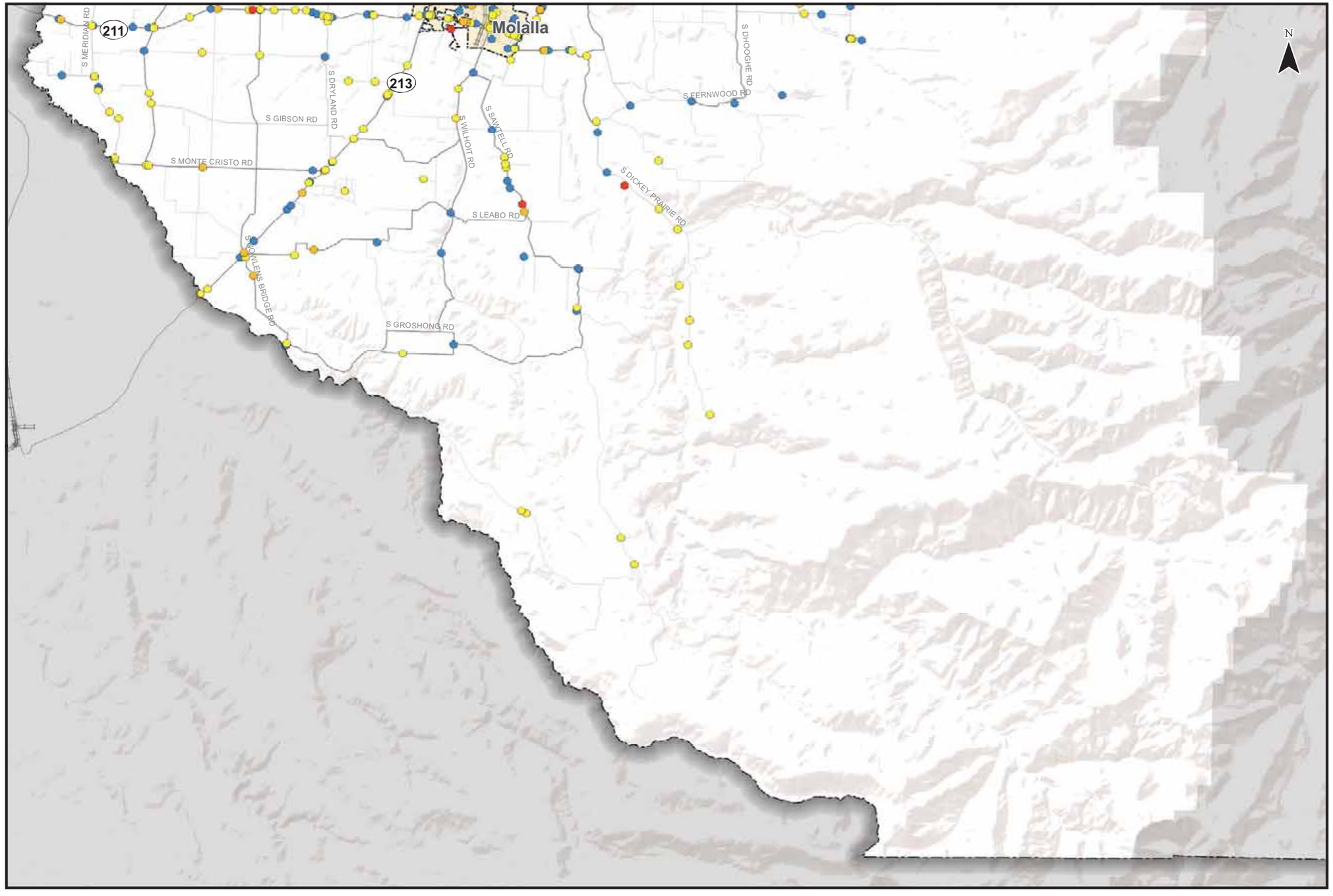
CLACKAMAS COUNTY TRANSPORTATION SYSTEM PLAN Update



Crashes Involving Aggressive Driving

- Fatal Crash
- Serious Injury Crash
- Minor Injury Crash
- PDO Crash
- Incorporated Areas
- County Boundary
- UGB



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Oregon Department of Transportation

Crashes Involving Aggressive Driving 2007-2010
Southwest County - Southern Portion

Figure
SS 28

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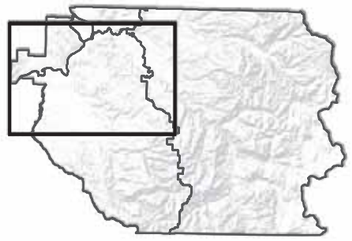
CLACKAMAS COUNTY TRANSPORTATION SYSTEM PLAN *Update*



Roadway Departure Crashes

- Fatal Crash
- Serious Injury Crash

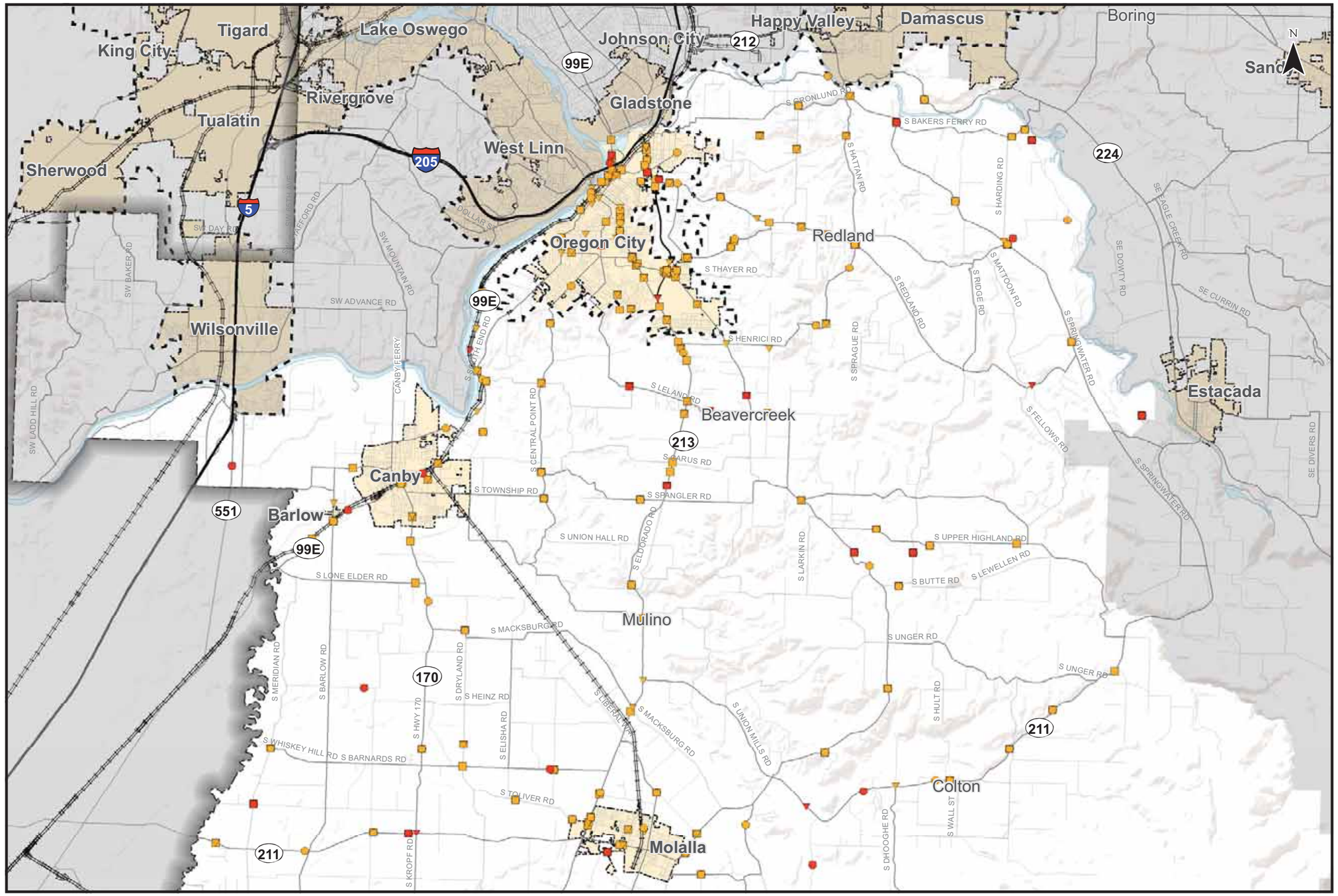
Crashes Involving Young Drivers (15-25 Years Old)

- Fatal crash
- Serious Injury Crash

Aggressive Driving Crahses

- Fatal Crash
- Severe Injury Crash

- Incorporated Areas
- County Boundary
- UGB



0 1 2 3 4 Miles

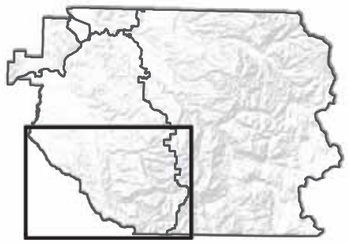
Coordinate System:
NAD 1983 HARN StatePlane Oregon North FIPS 3601 Feet Intl
Data Source:
Clackamas County, Metro Data Resouce Center, Oregon Department of Transportation

Fatal & Serious Injury, Roadway Departure, Young Driver & Aggressive Driving Crashes Southwest County - Northern Portion

Figure
SN 29

H:\proffile\11732 - Clackamas County TSP\gis\11x17 Maps\29 Fatal & Serious Injury, Roadway Departure, Young Driver & Aggressive Driving Crashes.mxd

CLACKAMAS COUNTY TRANSPORTATION SYSTEM PLAN Update

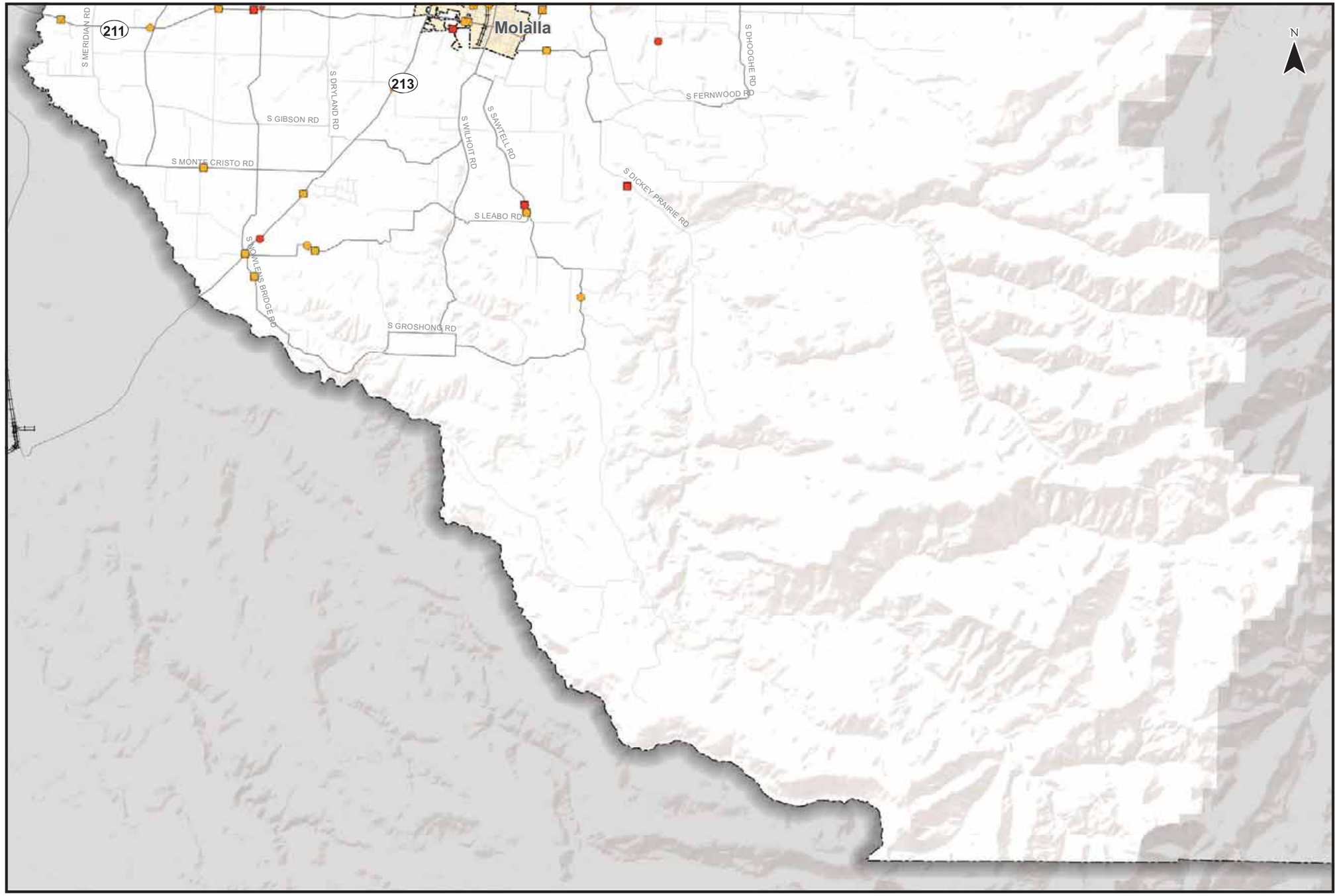


Roadway Departure Crashes
- Fatal Crash
- Serious Injury Crash

Crashes Involving Young Drivers (15-25 Years Old)
- Fatal crash
- Serious Injury Crash

Aggressive Driving Crahses
- Fatal Crash
- Severe Injury Crash

- Incorporated Areas
- County Boundary
- UGB



0 1 2 3 4 Miles

Coordinate System:
NAD 1983 HARN StatePlane Oregon North FIPS 3601 Feet Intl
Data Source:
Clackamas County, Metro Data Resouce Center,
Oregon Department of Transportation

Fatal & Serious Injury, Roadway Departure, Young Driver & Aggressive Driving Crashes Southwest County - Southern Portion

Figure
SS 29

H:\profile\11732 - Clackamas County TSP\gis\11x17 Maps\29 Fatal & Serious Injury, Roadway Departure, Young Driver & Aggressive Driving Crashes.mxd

Specific Safety Focus Intersections

County staff identified a number of safety focus intersections that were flagged for one or more of the following reasons:

- Approaching roads are offset;
- Sight distance is limited on approach to or at an intersection;
- Intersecting roads are skewed (do not intersect at 90-degrees);
- Geometry of approaching roads is challenging or motorists and/or
- Intersection geometry or lane configuration is unconventional.

The purpose of identifying these types of intersections is to proactively consider potential improvements in advance of the intersections appearing on the County's priority location list discussed above. The basic characteristics noted above are some geometric features that may make the driving task more difficult and therefore increase the risk of crashes occurring. For example, American Association of State Highway and Transportation Officials (AASHTO's) *Highway Safety Manual* notes skewed stop controlled intersections tend to experience more crashes than intersections with roads crossing at 90-degrees.[1]

Figure S 32 illustrates the location of these intersections. Table S 8 summarizes the safety focus intersections.

Table S 8 Safety Focus Intersections in Southwest County

Major Road	Minor Road	Reason Identified	County Safety Priority Location?	Located on an Candidate Safety Corridor?
Bakers Ferry	Between Eaden and Harding	Approach Geometry	-	-
Barlow	Lone Elder	Intersection Crash History	-	-
Barlow	Whiskey Hill Road	Intersection Crash History	-	-
Barlow	Schneider	Approach Geometry and Intersection Skew	-	-
Beavercreek Rd	Steiner/Yeoman	Unconventional Geometry	-	-
Beavercreek Rd	Lower Highland	Intersection Skew	-	Yes
Beavercreek Rd	Gard Rd	Sight Distance	-	Yes
Beavercreek Rd	S Salo	Intersection Skew and Unconventional Geometry	-	-
Beavercreek Rd	Upper Highland Rd	Intersection Skew and Unconventional Geometry	-	Yes
Beavercreek Rd	Butte	Intersection Skew and Sight Distance	-	Yes
Beavercreek Rd	Wilson	Intersection Skew	-	-
Beavercreek Rd	Unger/Windy City	Sight Distance	-	-
Boones Ferry Road	Butteville	Intersection Skew, Approach Geometry, Sight Distance	-	-
Buckner Creek	New Kirchner	Sight Distance	-	-
Buckner Creek	Howard's Mill	Sight Distance and Approach Geometry (Vertical Curve)	-	-
Callahan	Ramsby	Unconventional Geometry	-	-

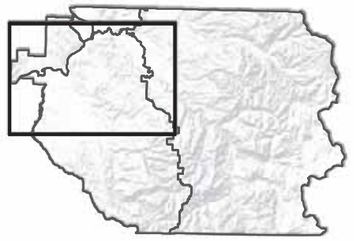
[1] AASHTO. *1st Edition of the Highway Safety Manual*. 2010. (See Volume 3, Part D, page 14-16).

Major Road	Minor Road	Reason Identified	County Safety Priority Location?	Located on an Candidate Safety Corridor?
Canby Marquam	Lone Elder	Intersection Skew	-	Yes
Canby Marquam	Barnards	Intersection Crash History	-	-
Canby Marquam	Gribble	Intersection Skew	-	-
Canby Marquam	Macksburg	Intersection Skew	-	Yes
Central Point	Carus	Intersection Skew	-	-
Central Point	Bremer	Intersection Offset	-	-
Central Point	Geiger	Intersection Skew and Intersection Offset	-	-
Central Point	New Era	Intersection Skew and Sight Distance	Yes	-
Dickey Prairie Rd	Megan/Kuban	Intersection Skew, Intersection Offset, Sight Distance	-	-
Dryland	Macksburg	Offset Intersection and Unconventional Geometry	-	-
Dryland	Heinz	Intersection Crash History	-	-
Eby	Cramer	Intersection Crash History	-	-
Fellows	Redland Rd up the hill	Approach Geometry and Intersection Skew	-	-
Feyrer Park	Dickey Prairie	Approach Geometry and Intersection Skew	-	-
Fischers Mill	Hattan	Intersection Skew	-	-
Forsythe	Victory	Intersection Skew	-	-
Grays Hill	Schieffer	Offset Intersection	-	-
Grays Hill	Engstrom	Intersection Skew and Approach Geometry	-	-
Gronlund	Bradley/Hoffman	Intersection Skew and Approach Geometry	-	-
Hattan	Gronlund	Intersection Skew, Approach Geometry, Sight Distance	-	-
Hult	Cliffside/Reynolds	Unconventional Geometry	-	-
Kamrath	Carus	No apparent issues in the field	-	-
Knights Bridge	Arndt/Barlow	Intersection Skew and Annual Flooding	-	-
Kropf	Monte Cristo	Sight Distance	-	-
Lower Highland	Ridge	Sight Distance and Intersection Skew	-	-
Meridian	Whiskey Hill	Intersection Skew	-	-
Molalla	Sprague	Intersection Skew	-	-
Molalla	Vaughn	Intersection Skew and Unconventional Geometry	-	-
New Kirchner	Spangler	Approach Geometry and Sight Distance	-	-
Redland	Near Neibur 90 degree	Intersection Skew and Unconventional Geometry	-	Yes
Redland	Fischers Mill	Intersection Skew	-	-
Redland	Henrici	Intersection Skew and Sight Distance	-	Yes
Redland	Ridge	Approach Geometry and Sight Distance	-	-
Ridge	Alberta/Mosier	Intersection Skew and Approach Geometry	-	-
Ringo	Howard's Mill	Intersection Skew and Approach Geometry	-	-
S Butte Creek Rd	Near Barstow Rd	Approach Geometry and Intersection Skew	-	-
Sawtell Rd	Leabo	Intersection Skew	-	-
Scotts Mills Maple Grove	Blair	Intersection Skew	-	-
Scotts Mills Maple Grove	Groshong	Intersection Crash History	-	-
Scotts Mills	S Sawtell	Intersection Skew and Approach Geometry	-	-

Major Road	Minor Road	Reason Identified	County Safety Priority Location?	Located on an Candidate Safety Corridor?
Maple Grove				
Springwater	Bakers Ferry	Intersection Skew	Yes	-
Springwater	Fischers Mill	Intersection Skew and Close to Four Other Intersections	-	-
Springwater	Redland	Intersection Skew	-	-
Springwater	Hattan Rd	Sight Distance	-	-
Springwater	Harding	Intersection Skew and Close to Four Other Intersections	Yes	-
Springwater	Babler/Gerber	Intersection Skew	-	-
Thayer	Thayer	Intersection Crash History	-	-
Township	Mulino	Intersection Crash History	-	-
Township	Central Point	Intersection Skew and Approach Geometry	-	-
Union Mills	OR 213 to OR 211	Intersection Crash History	-	-
Upper Highland	Between Ridge and Diane	Roadway Curvature	-	Yes
Wall	Green Mountain	Sight Distance	-	-
Windy City	East of Salo	Intersection Crash History	-	-
Wright	S Fernwood	Intersection Skew and Sight Distance	-	-
Wright	Callahan	Intersection Skew and Sight Distance	-	-
Wright	Between Feyrer Park and OR 211	Intersection Crash History	-	-

The list of safety focus intersections shown in Table E 6 supplements the County's Safety Priority Locations and the Candidate Safety Corridors discussed above. There is some overlap between the safety focus intersections and the previous safety locations presented. Three of the safety focus intersections identified by the County are also part of the County Safety Priority Locations presented and discussed above. Nine of the safety focus intersections are located on a candidate safety corridor discussed above. The remaining intersections listed are either skewed intersections and/or have limited sight distance. These are candidate intersections for proactive improvements to help reduce the likelihood of crashes. In a forthcoming TSP Update Alternative Analysis, potential projects, programs, studies and/or policies to improve these locations will be discussed.

CLACKAMAS COUNTY TRANSPORTATION SYSTEM PLAN Update



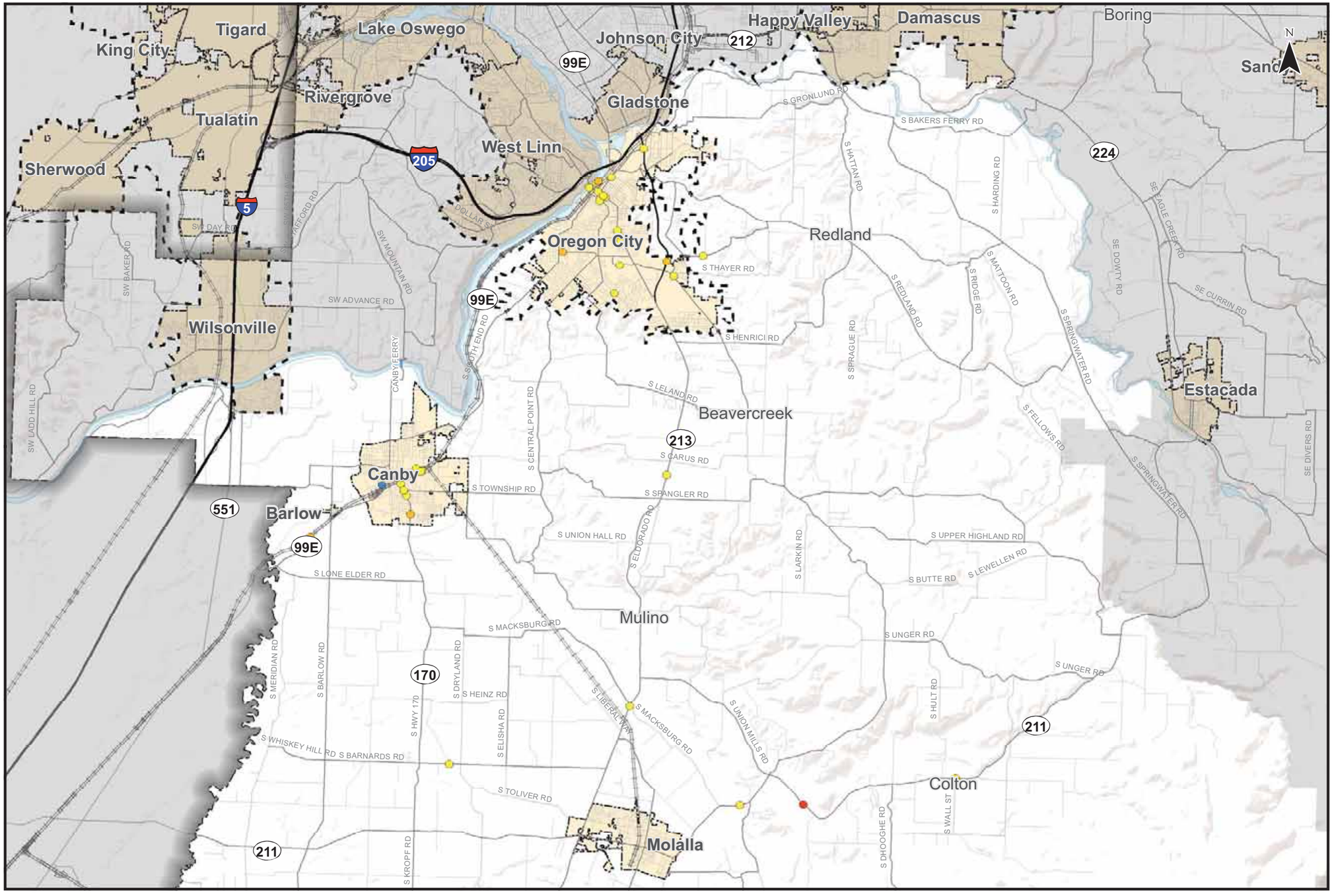
Crashes Involving Pedestrians

- Fatal Crash
- Serious Injury Crash
- Minor Injury Crash
- PDO Crash

Incorporated Areas

County Boundary

UGB



0 1 2 3 4 Miles

Coordinate System:
NAD 1983 HARN StatePlane Oregon North FIPS 3601 Feet Intl
Data Source:
Clackamas County, Metro Data Resouce Center,
Oregon Department of Transportation

Crashes Involving Pedestrians 2007-2010
Southwest County - Northern Portion

Figure
SN 30

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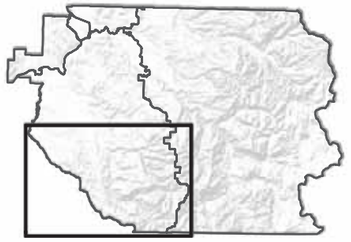
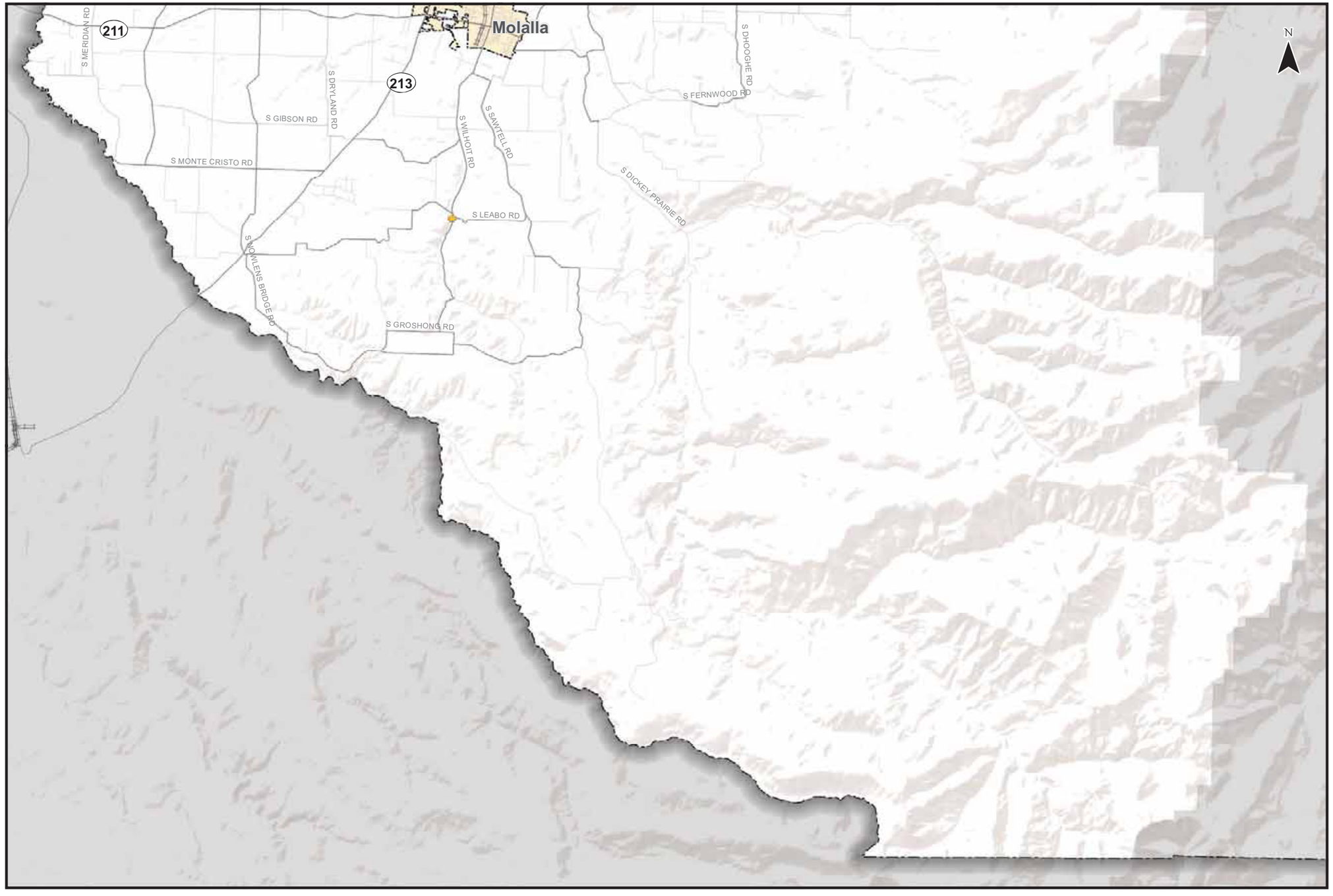
CLACKAMAS COUNTY TRANSPORTATION SYSTEM PLAN *Update*



Crashes Involving Pedestrians

- Fatal Crash
- Serious Injury Crash
- Minor Injury Crash
- PDO Crash

- Incorporated Areas
- County Boundary
- UGB



0 1 2 3 4 Miles

Coordinate System:
NAD 1983 HARN StatePlane Oregon North FIPS 3601 Feet Intl
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Clackamas County, Metro Data Resouce Center,
Oregon Department of Transportation

Crashes Involving Pedestrians 2007-2010
Southwest County - Southern Portion

Figure
SS 30

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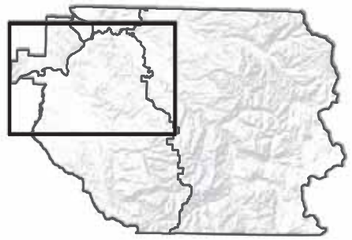
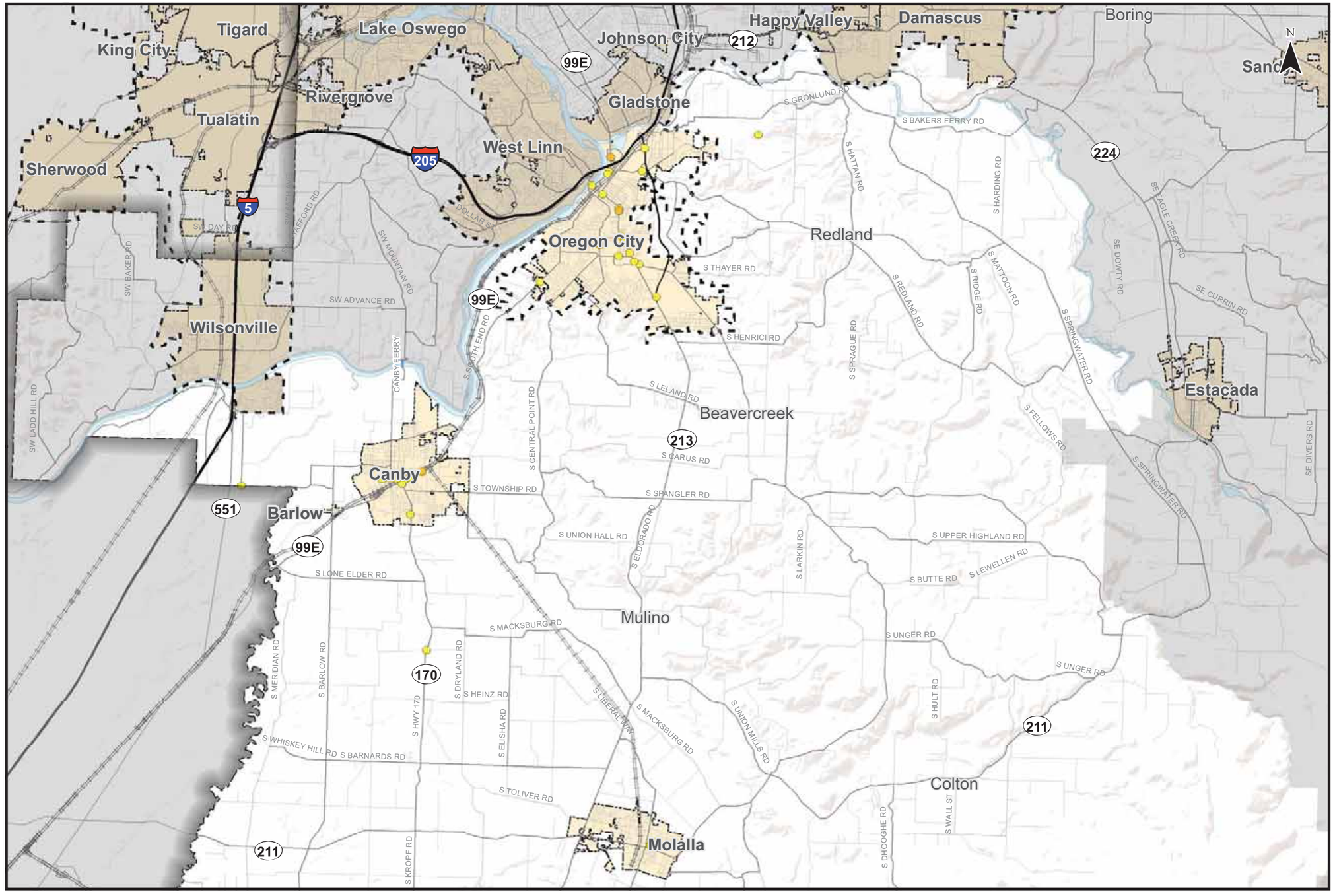
CLACKAMAS COUNTY TRANSPORTATION SYSTEM PLAN Update



Crashes Involving Bicycles

- Fatal Crash
- Serious Injury Crash
- Minor Injury Crash
- PDO Crash

- Incorporated Areas
- County Boundary
- UGB



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Oregon Department of Transportation

Crashes Involving Bicycles 2007-2010
Southwest County - Northern Portion

Figure
SN 31

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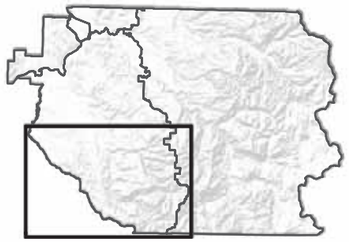
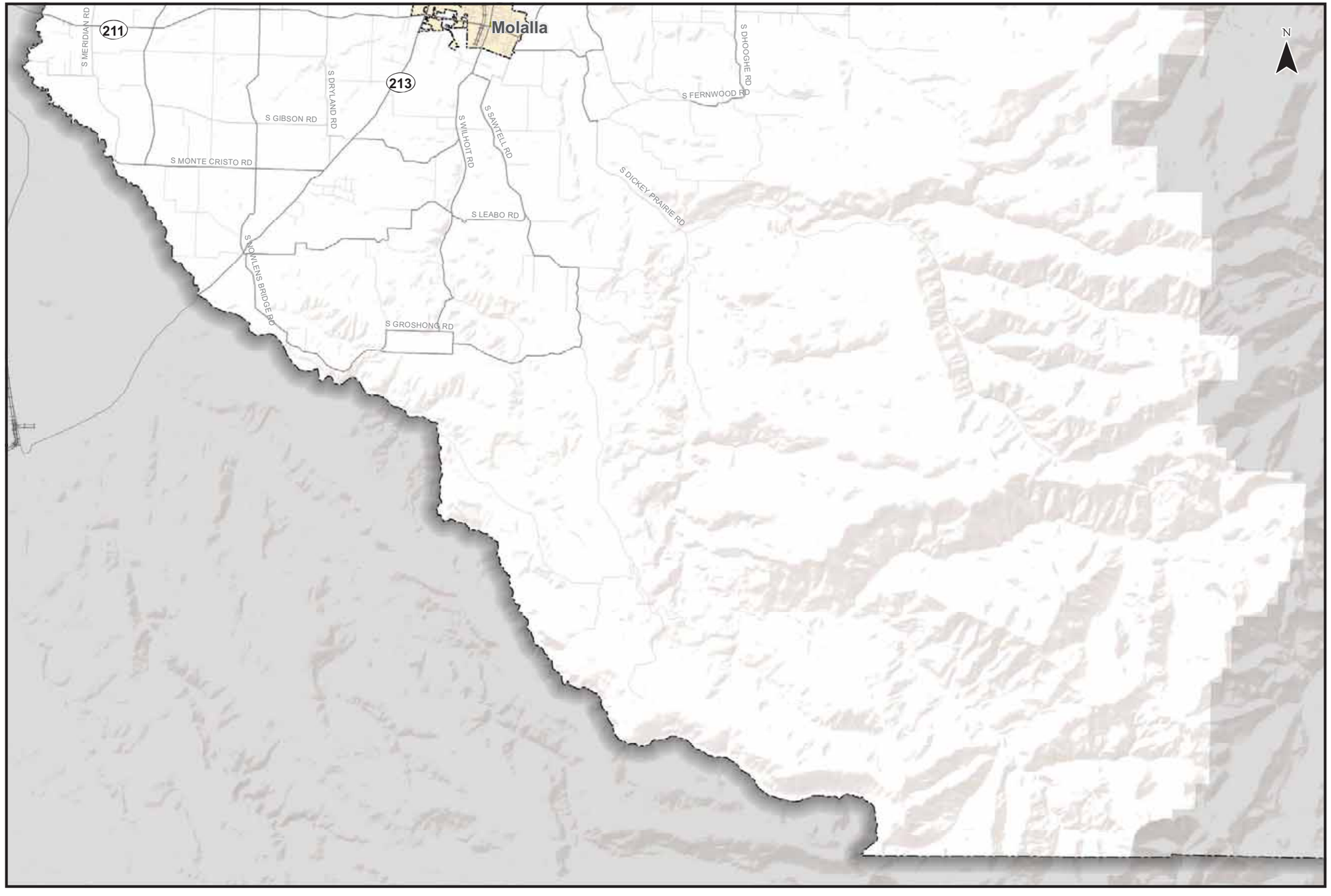


Crashes Involving Bicycles

- Fatal Crash
- Serious Injury Crash
- Minor Injury Crash
- PDO Crash

- Incorporated Areas
- County Boundary
- UGB



0 1 2 3 4 Miles

Coordinate System:
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Data Source:
Clackamas County, Metro Data Resouce Center,
Oregon Department of Transportation

Crashes Involving Bicycles 2007-2010
Southwest County - Southern Portion

Figure
SS 31

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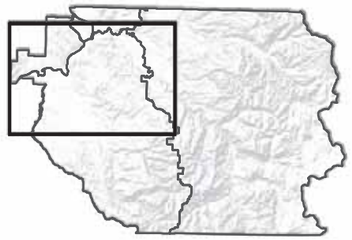
CLACKAMAS COUNTY TRANSPORTATION SYSTEM PLAN Update



Safety Focus Intersections

Functional Classifications

- Freeway
- Expressway
- Major Arterial
- Minor Arterial
- Collector
- Connector
- Local
- Forest Service Paved
- Forest Aggregate Road
- General dirt, road or trail
- Other
- Railroad
- Incorporated Areas
- County Boundary
- UGB

0 1 2 3 4 Miles

Coordinate System:
NAD 1983 HARN StatePlane Oregon North FIPS 3601 Feet Intl
Data Source:
Clackamas County, Metro Data Resouce Center

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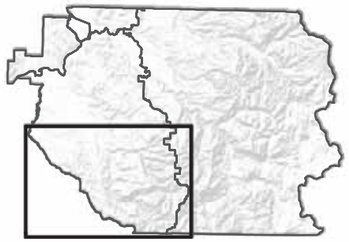
Safety Focus Intersections
Southwest County - Northern Portion

Figure
SN 32

CLACKAMAS COUNTY TRANSPORTATION SYSTEM PLAN Update



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0 1 2 3 4 Miles

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Clackamas County, Metro Data Resouce Center

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Safety Focus Intersections
Southwest County - Southern Portion

Figure
SS 32

FUTURE BASE CONDITIONS – SOUTHWEST COUNTY

INTRODUCTION

This section summarizes the results of the projected future traffic conditions and analysis for the Southwest County area. It evaluates study intersections performance in the year 2035 assuming growth and development occurs and some planned modifications are made to the transportation system. Two future base scenarios were analyzed:

1. **Low Build:** Assumes that only planned transportation projects with funding currently allotted are completed.
2. **Full Build:** Assumes that all transportation projects identified in the existing TSP planned before the year 2035 are completed.

The approach and methodology to the Future Base Conditions analysis is further described in Section 2. This section focuses on the results of the analysis in terms of intersection and roadway operations.

2035 LOW BUILD SCENARIO

The low-build scenario assumes the completion of transportation projects identified in the existing Clackamas County TSP and Metro Regional Transportation Plan (RTP) with funding currently allotted. The purpose of the low build scenario is to identify intersections and roadways that will not meet standards in 2035 if only the currently funded transportation projects are completed. The analysis will also indicate which projects in the low build scenario help bring the operations on intersections and roadways up to standards.

The forecast traffic volumes, roadway cross-sections, and intersection configurations were adjusted to reflect this scenario, based on the low build capacity projects mapped in Figure S 33. The projects that affect roadway or intersection capacity are listed and described in Table S 9.

Table S 9 Low Build Projects in Southwest County

Project	ID	Location	Description
Wilsonville Rd/I-5 Interchange Improvements	U012	On and Off Ramps, N and S of interchange	Widen and lengthen on/off ramps
I-205/OR. 213 Interchange	U014	Washington St. to I-205	Improve and widen OR 213 including reconstruction of intersection of OR 213 and Washington Street. Address safety and provide congestion relief.

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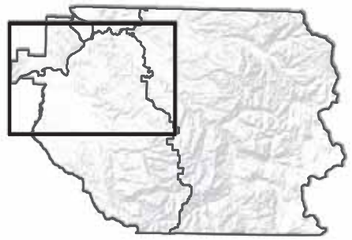

2035 Low Build Projects

- Intersection Projects
- Roadway Projects
- Incorporated Areas
- County Boundary
- UGB

This figure displays the projects included in the 2035 Low Build Scenario. The 2035 Low Build Scenario assumes the transportation projects in the existing Clackamas County TSP and Metro Regional Transportation Plan (RTP) with funding currently allotted are completed by 2035. The purpose of the 2035 Low Build Scenario is to identify intersections and roadways that will not meet standards in 2035 if only the currently funded transportation projects are implemented.

0 1 2 3 4 Miles

Coordinate System:
NAD 1983 HARN StatePlane Oregon North FIPS 3601 Feet Intl
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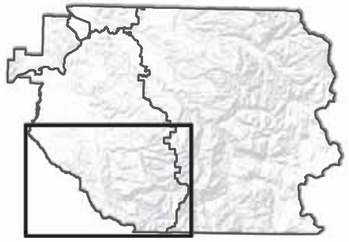
2035 Low Build Projects
Southwest County - Northern Portion

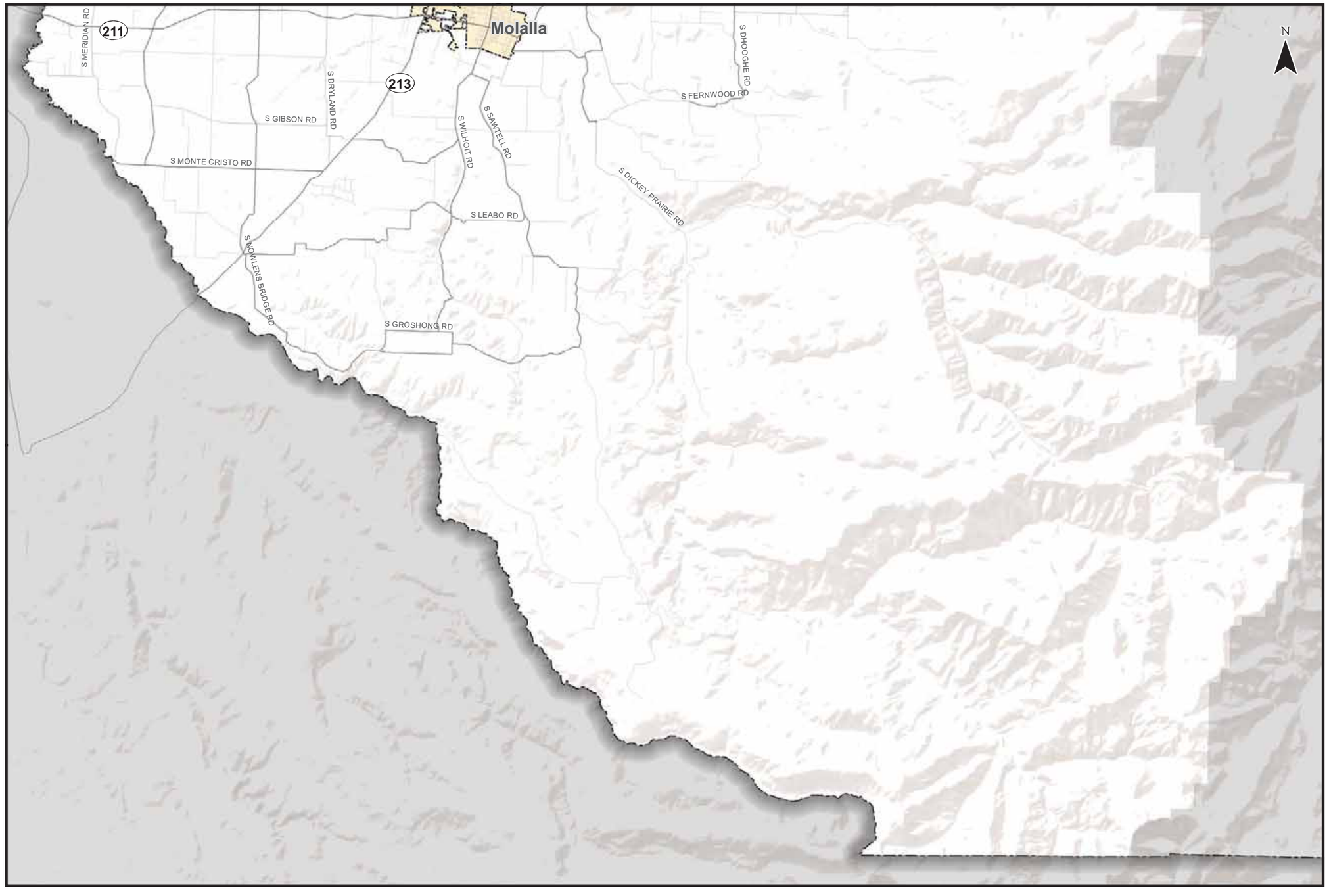
Figure
SN 33

CLACKAMAS COUNTY TRANSPORTATION SYSTEM PLAN Update



2035 Low Build Projects

- Intersection Projects
- Roadway Projects
- Incorporated Areas
- County Boundary
- UGB



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0 1 2 3 4 Miles

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2035 Low Build Projects
Southwest County - Southern Portion

Figure
SS 33

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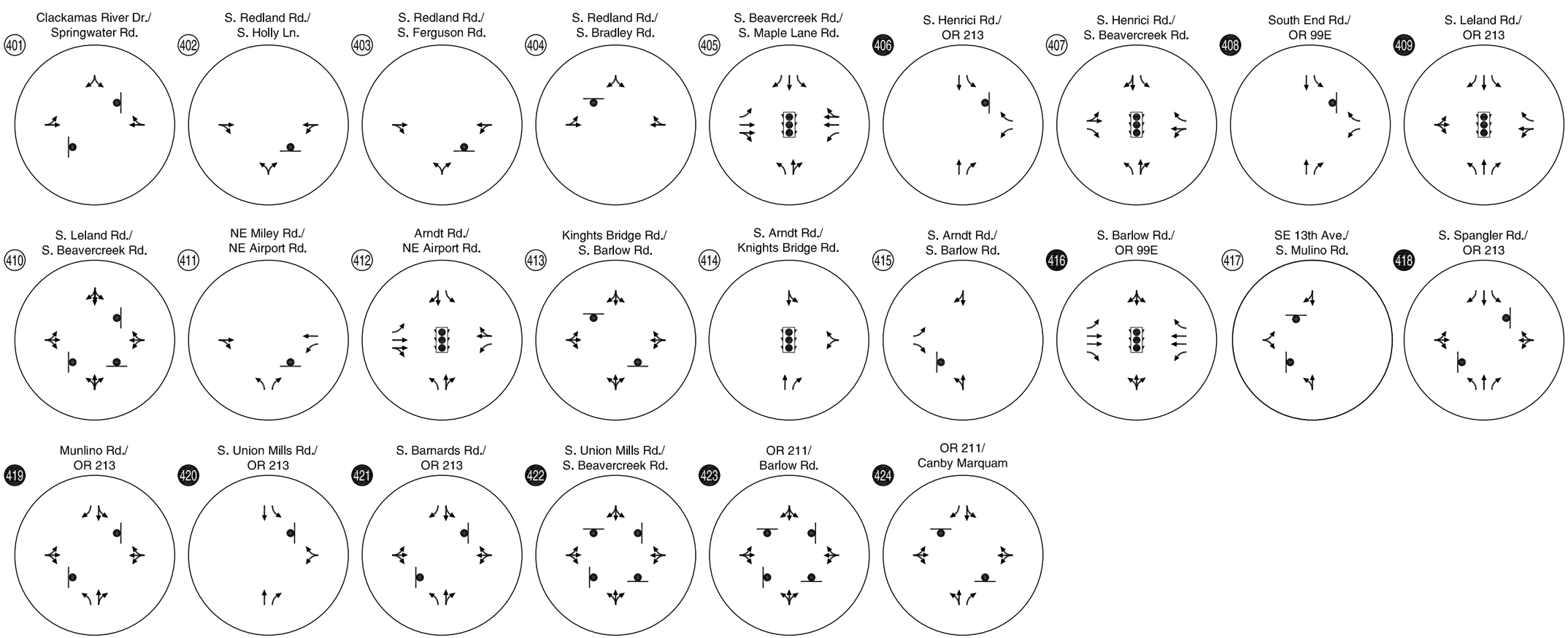
Study Intersection Analysis

Any uncompleted low-build projects that affect lane configurations or traffic control at study intersections were accounted for and are noted in Figure S 34. The operations at the study intersections were analyzed based on the traffic volumes forecasted under the low-build scenario and are illustrated in Table S 10 and Figure S 35. Intersections that do not meet standards are noted.

Table S 10 2035 Low Build Traffic Operations Analysis Results at Study Intersections in Southwest County

ID	Intersection	Jurisdiction	Performance Standard	Meets Standard?	Low Build Project?	Meets Standard in 2035 Low Build?
401	Clackamas River Dr/Springwater Rd	County	LOS =D	No	No	No (LOS F)
402	S. Redland Road/S. Holly Lane	County	V/C = 0.99	Yes	No	No (v/c=2.39)
403	S. Redland Rd/S. Ferguson Rd	County	LOS = D	Yes	No	No (LOS E)
404	S. Redland Rd/S. Bradley Rd	County	LOS = D	Yes	No	Yes
405	S. Beavercreek Rd/S. Maple Lane Rd	County	V/C = 0.99	Yes	No	No (v/c=1.02)
406	S. Henrici Rd/OR 213	ODOT	V/C = 0.75	Yes	No	No (v/c=4.54)
407	S. Henrici Rd/S. Beavercreek Rd	County	LOS = D	Yes	No	Yes
408	South End Rd./OR 99E	ODOT	V/C = 0.75	Yes	No	No (v/c=1.07)
409	S. Leland Rd/OR 213	ODOT	V/C = 0.80	No	No	No (v/c=1.06)
410	S. Leland Rd/S. Beavercreek Rd	County	LOS = D	Yes	No	Yes
411	NE Miley Rd/NE Airport Rd	County	LOS = D	Yes	No	No (LOS=E)
412	Arndt Rd/NE Airport Rd	County	LOS = D	Yes	No	Yes
413	Knights Bridge Rd/S. Barlow Rd	County	LOS = D	Yes	No	Yes
414	Arndt Rd/Knights Bridge Rd	County	LOS = D	Yes	No	Yes
415	Arndt Rd/S. Barlow Rd	County	LOS = D	Yes	No	Yes
416	OR 99E/S. Barlow Rd	ODOT	V/C = 0.75	No	No	No (v/c=1.19)
417	SE 13th Ave/S. Mulino Rd	County	LOS = D	Yes	No	Yes
418	S. Spangler Rd/OR 213	ODOT	V/C = 0.75	Yes	No	No (v/c=1.33)
419	Mulino Rd/OR 213	ODOT	V/C = 0.80	Yes	No	Yes
420	S. Union Mills Rd/OR 213	ODOT	V/C = 0.75	Yes	No	Yes
421	S. Barnards Rd/OR 213	ODOT	V/C = 0.75	Yes	No	Yes
422	S. Union Mills Rd/S. Beavercreek Rd	ODOT	V/C = 0.75	Yes	No	No (v/c=0.97)
423	OR 211/Barlow Rd	ODOT	V/C = 0.75	Yes	No	Yes
424	OR 211/Canby Marquam	ODOT	V/C = 0.75	Yes	No	Yes

As shown in the table, the intersections of Clackamas River Drive/Springwater Road (401), S. Leland Road/OR 213 (409), and OR 99E/S. Barlow Road (416) continue to not meet standards under the low build scenario. An additional eight intersections that are meeting standards under the existing conditions are projected to not meet standards under the low build scenario. None of the study intersections in Southwest County are affected by capacity projects in the low build scenario. *Appendix 8* contains detailed traffic operations analysis results.

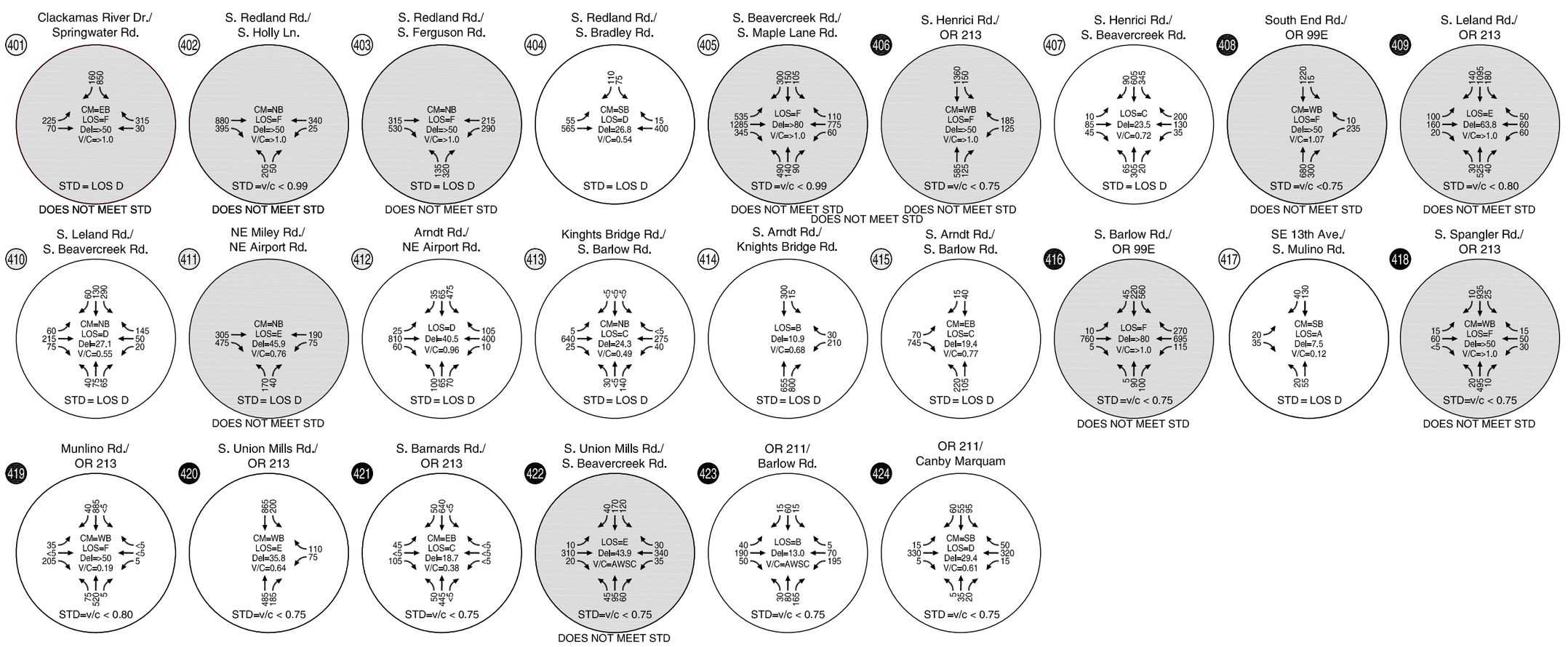


- ## - ODOT STUDY INTERSECTION
- (##) - COUNTY STUDY INTERSECTION
- - STOP SIGN
- - TRAFFIC SIGNAL
- - ROUNDABOUT
- ⇨ - LANE REMOVED
- → - LANE ADDED

Low Build Lane Configuration and Traffic Control Devices Southwest County

CLACKAMAS COUNTY Transportation System Plan Update

Figure S 34



CM = CRITICAL MOVEMENT (UNSIGNALIZED)
LOS = INTERSECTION LEVEL OF SERVICE (SIGNALIZED)/CRITICAL MOVEMENT LEVEL OF SERVICE (UNSIGNALIZED)
Del = INTERSECTION AVERAGE CONTROL DELAY (SIGNALIZED)/CRITICAL MOVEMENT CONTROL DELAY (UNSIGNALIZED)
V/C = CRITICAL VOLUME-TO-CAPACITY RATIO
STD = OPERATIONAL STANDARD

Low Build Intersection Operations
PM Peak Hour
Southwest County

CLACKAMAS COUNTY Update
TRANSPORTATION SYSTEM PLAN

Figure
S 35

Roadway Segment Analysis

The roadway segment operations analysis consists of considering the roadway segment volumes and approximate level of congestion based on a comparison of the volume to the segment capacity. *Section 3 Assumptions and Methods* provides additional details on the scope and approach to the analysis below.

Roadway Segment Volumes

The roadway segment volumes provide a sense of the demand for travel on the roadways. Figure S 36 illustrates the roadway link volumes from the weekday evening peak hour for the 2035 Low Build Scenario.

As is evident from Figure S 37, under the 2035 Low Build Scenario demand for travel is highest along OR 213, OR 99E, S Beavercreek Road, S Redland Road, S Springwater Road, OR 170, and S Union Hill Road. These trends are consistent with the existing conditions.

Approximate Level of Congestion

The level of roadway segment congestion experienced for the 2035 Low Build Scenario was estimated using the roadway segment volumes from the Metro model and the roadway segment capacity. The volume was compared to the capacity to calculate a volume-to-capacity ratio that is used to estimate level of congestion.

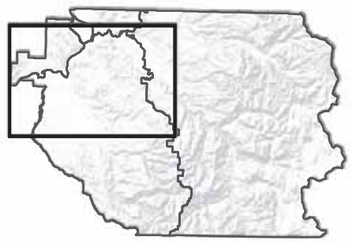
Figure S 37 illustrates the relative congestion during the 2035 Low Build weekday evening peak hour on roadways based on the estimated roadway segment volumes and capacity.

As can be seen in Figure S 37, under the 2035 Low Build Scenario portions of OR 213, Arndt Road NE, OR 99E, S Barlow Road, S Beavercreek Road and S Hattan Road are estimated to begin experiencing varying levels of congestion ranging from some congestion to very congested. The majority of roads in the rural area continue to be uncongested. Table S 11 Table S 3**Error! Reference source not found.**lists the roadway segments that have volume-to-capacity ratios over 0.8 and describes the level of congestion as nearing congestion, some congestion, congested, or very congested.

Table S 11 2035 Low Build Roadway Segment Congestion in Southwest County

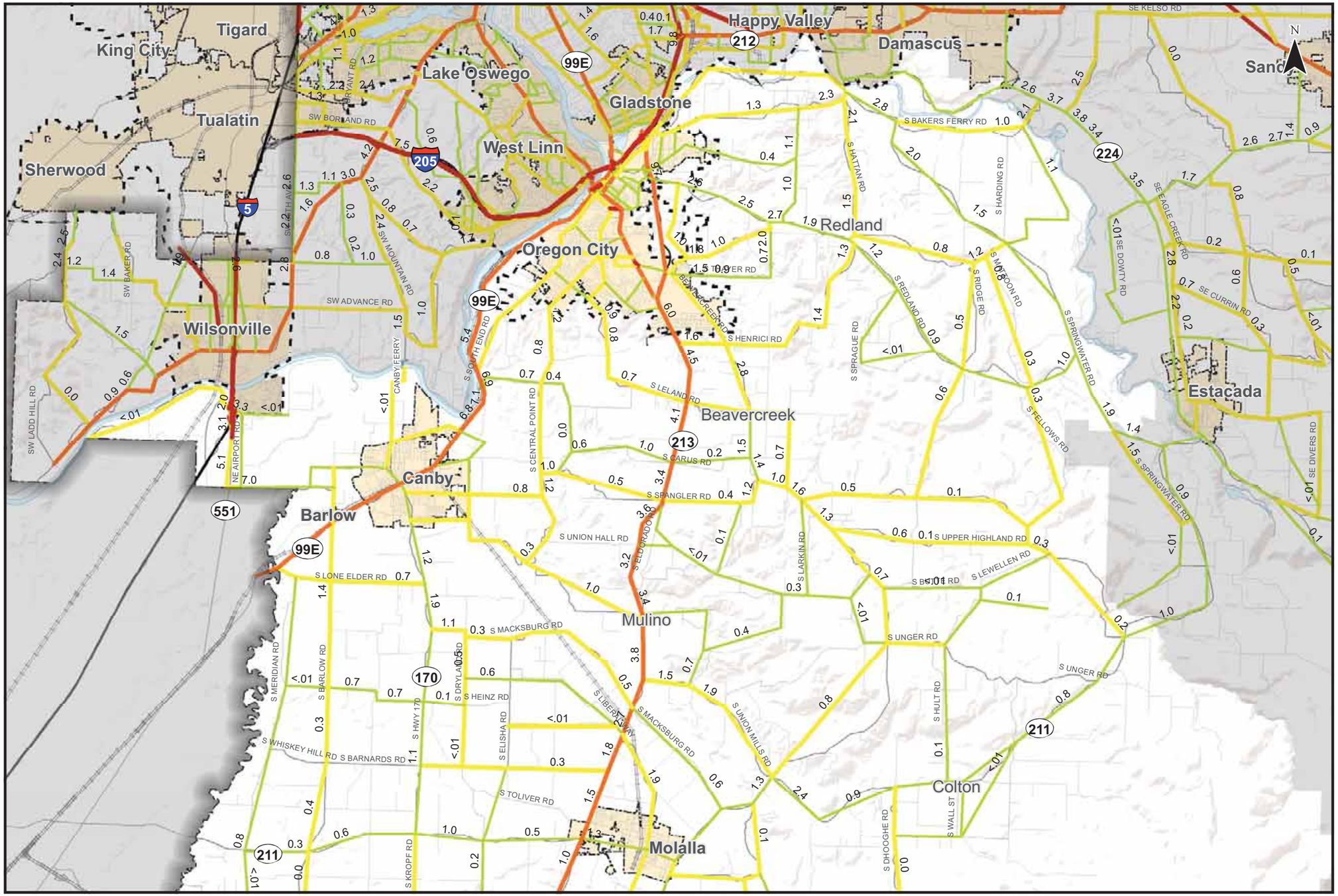
Roadway	Segment	Level of Congestion
OR 551	County Boundary to I-5	Very Congested
S Arndt Rd	OR 551 to S Barlow Rd	Very Congested
S Barlow Rd	OR 99E to S Arndt Rd	Very Congested
OR 213	S Carus Rd to Oregon City northern UGB Boundary	Nearing Congestion to Congested
S Knights Bridge	S Barlow Rd to N Holly St	Nearing Congestion to Congested
OR 99 E	North of S South End Rd	Some Congestion to Very Congested
S Central Point Rd	S Partflow Rd to Leland Rd	Nearing Congestion to Very Congested
S South End Rd	S Partflow Rd to North boundary of area	Very Congested
Beavercreek Rd	S Henrici Rd to S Thayer Rd	Nearing Congestion
S Hattan Rd	S Bakers Ferry Rd to South of OR 212	Very Congested
S Bakers Ferry Rd	S Hattan Rd to S Springwater Rd	Nearing Congestion
S Ferguson Rd	S Walker Rd to S Redland Rd	Nearing Congestion to Some Congestion

CLACKAMAS COUNTY TRANSPORTATION SYSTEM PLAN Update



2035 Low Build Volumes

- Freeway
- Principal / Major Arterial
- Minor Arterial
- Other
- #.# PM Weekday Traffic Volume in Thousands
- Incorporated Areas
- County Boundary
- UGB



0 1 2 3 4 Miles

Coordinate System:
NAD 1983 HARN StatePlane Oregon North FIPS 3601 Feet Intl
Data Source:
Cambridge Systematics, Clackamas County,
Metro Data Resouce Center

Evening Weekday Peak Hour Link Volumes 2035 Low Build Scenario
Southwest County - Northern Portion

Figure
SN 36

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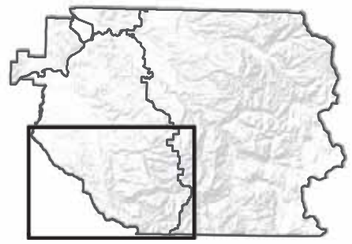
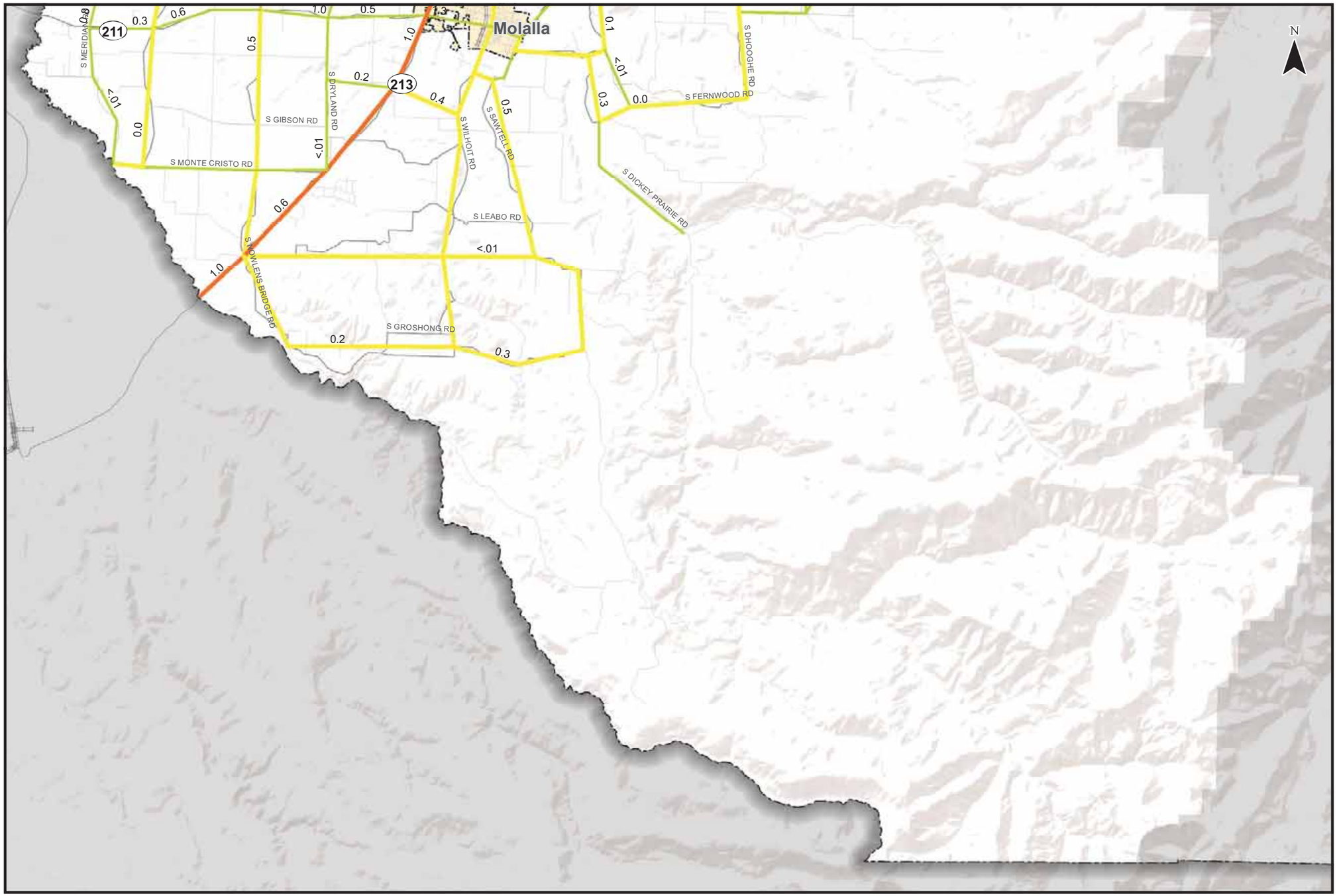
CLACKAMAS COUNTY TRANSPORTATION SYSTEM PLAN *Update*



2035 Low Build Volumes

- Freeway
- Principal / Major Arterial
- Minor Arterial
- Other
- #.# PM Weekday Traffic Volume in Thousands
- Incorporated Areas
- County Boundary
- UGB



0 1 2 3 4 Miles

Coordinate System:
NAD 1983 HARN StatePlane Oregon North FIPS 3601 Feet Intl
Data Source:
Cambridge Systematics, Clackamas County,
Metro Data Resouce Center

Evening Weekday Peak Hour Link Volumes 2035 Low Build Scenario
Southwest County - Southern Portion

Figure
SS 36

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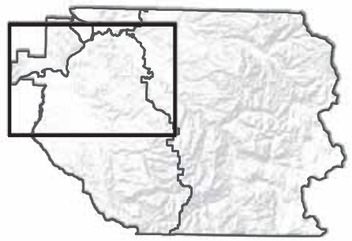
CLACKAMAS COUNTY TRANSPORTATION SYSTEM PLAN *Update*



Very Congested >1.10

- 1,000 Vehicles
- 5,000 Vehicles
- 10,000 Vehicles

Congested 1.0 - 1.1

- 1,000 Vehicles
- 5,000 Vehicles
- 10,000 Vehicles

Some Congestion 0.9 - 1.0

- 1,000 Vehicles
- 5,000 Vehicles
- 10,000 Vehicles

Nearing Congesion 0.8 - 0.9

- 1,000 Vehicles
- 5,000 Vehicles
- 10,000 Vehicles

Less Congested <0.8

- 100 Vehicles
- 1,000 Vehicles
- 10,000 Vehicles

- Incorporated Areas
- County Boundary
- UGB

0 1 2 3 4 Miles

Coordinate System:
NAD 1983 HARN StatePlane Oregon North FIPS 3601 Feet Intl
Data Source: Cambridge Systematics, Clackamas County, Metro Data Resouce Center

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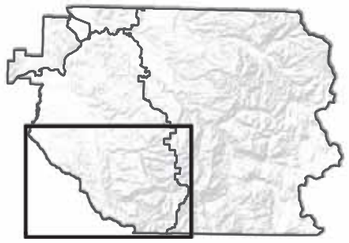
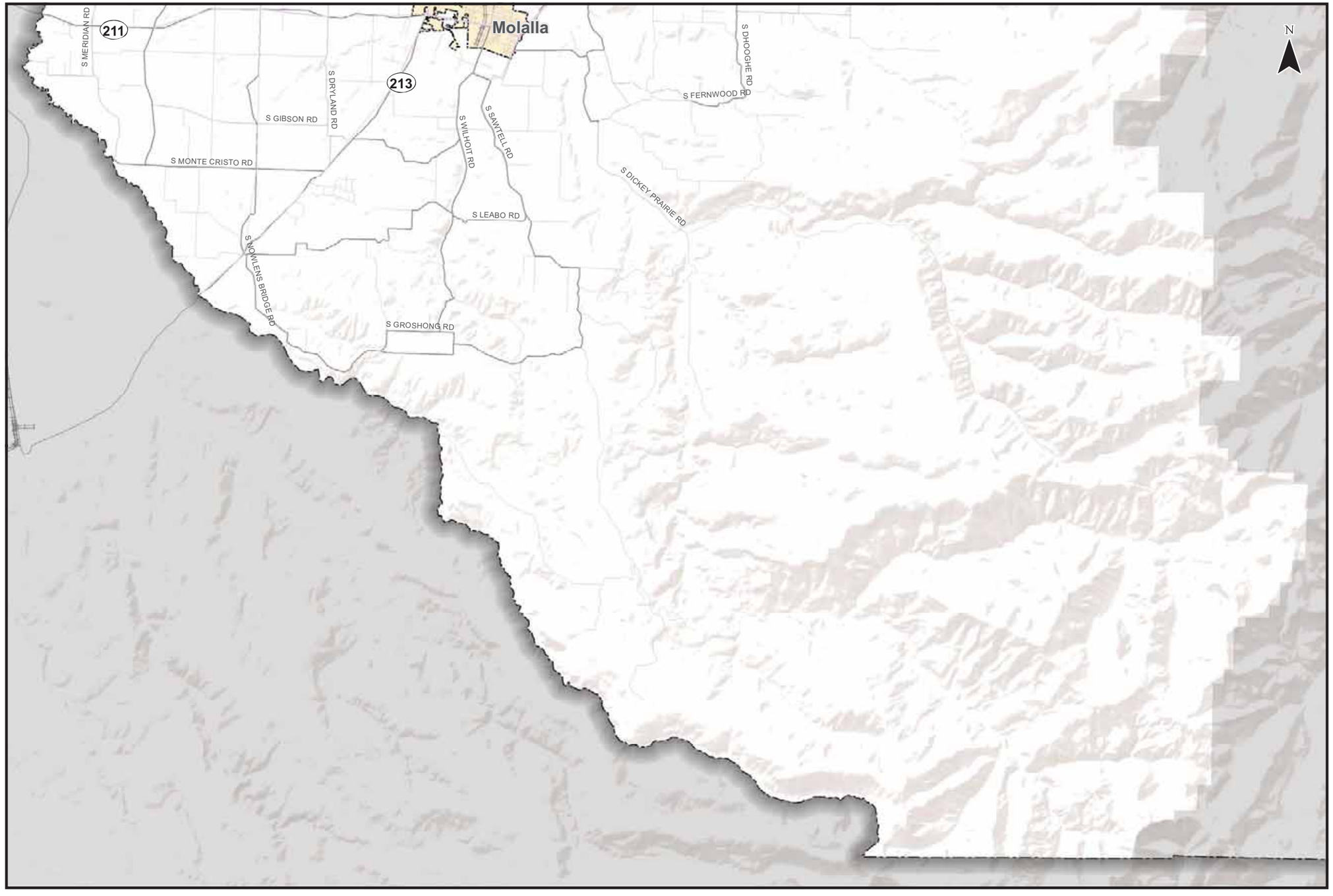
Evening Weekday Peak Hour Roadway Segment Congestion 2035 Low Build Scenario
Southwest County - Northern Portion

Figure
SN 37

CLACKAMAS COUNTY TRANSPORTATION SYSTEM PLAN *Update*





Very Congested >1.10
- 1,000 Vehicles
- 5,000 Vehicles
- 10,000 Vehicles

Congested 1.0 - 1.1
- 1,000 Vehicles
- 5,000 Vehicles
- 10,000 Vehicles

Some Congestion 0.9 - 1.0
- 1,000 Vehicles
- 5,000 Vehicles
- 10,000 Vehicles

Nearing Congesion 0.8 - 0.9
- 1,000 Vehicles
- 5,000 Vehicles
- 10,000 Vehicles

Less Congested <0.8
- 100 Vehicles
- 1,000 Vehicles
- 10,000 Vehicles
- Incorporated Areas
- County Boundary
- UGB

0 1 2 3 4 Miles

Coordinate System:
NAD 1983 HARN StatePlane Oregon North FIPS 3601 Feet Intl
Data Source: Cambridge Systematics, Clackamas County, Metro Data Resouce Center

Evening Weekday Peak Hour Roadway Segment Congestion 2035 Low Build Scenario
Southwest County - Southern Portion

Figure
SS 37

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2035 FULL BUILD SCENARIO

The full build scenario includes all of the existing planned projects in the County's current TSP and the Metro RTP. The purpose of analyzing the full build scenario is to determine how all transportation projects that are currently planned will improve future traffic operations. This will help identify which projects are necessary to address roadway and intersection operations that are below standard and which projects are located on facilities that are forecast to perform above standards. In addition, the full build analysis will identify intersections and roadways that do not meet standards even with planned transportation projects.

The forecast traffic volumes, roadway cross-sections, and intersection configurations were adjusted based on projects in the full build scenario that affect roadway or intersection capacity, such as the addition of turn lanes or roadway widening. The capacity full build projects are mapped in Figure S 38 and listed and described in Table S 12. There are several planned intersection and roadway projects. The majority of roadway projects involve reconstructing and widening rural roadways to three lanes to meet standards.

Table S 12 Full Build Projects in the Southwest County

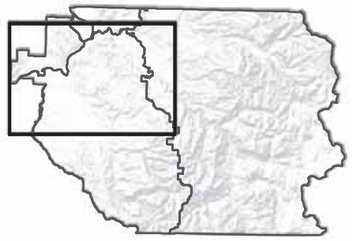
Project	ID	Location	Description
Wilsonville Rd/I-5 Interchange Improvements*	U012	On and Off Ramps, N and S of interchange	Widen and lengthen on/off ramps
I-205/OR 213 Interchange*	U014	Washington St. to I-205	Improve and widen OR 213 including reconstruction of intersection of OR 213 and Washington Street. Address safety and provide congestion relief.
Springwater Road	U184	OR 224 to Hattan Road	Four lane widening with left-turn lanes, widen bridge over Clackamas River
Forsythe Road	U186	Clackamas River Drive to Bradley Road	Reconstruct and widen (rural) (3 lanes)
Forsythe Road	U187	Forsythe Road/Victory Road intersection	Realignment, widening of Victory Road and removal or decrease of curves along Forsythe Road, relocation of intersection
Gronlund Road/ Hattan Road	U188	Bradley to Springwater	Reconstruct and widen (rural) (3 lanes)
Hattan Road	U189	Hattan Road/Gronlund Road intersection	Install southbound right-turn lane
Hattan Road	U190	Fischers Mill Road to Gronlund Road	Reconstruct and widen (rural) (3 lanes)
Abernethy Road	U191	Redland Road to Main Street	Realign 17th Street intersection, widen to 5 lanes
Holcomb Blvd.	U193	Holcomb Blvd./Bradley Road intersection	Realignment of Holcomb Road to form one intersection at Bradley Road
Bradley Road	U194	Redland Road to Holcomb Blvd.	Widen lanes and shoulders to County standards (3 lanes)
Redland Road	U198	Henrici Road to Abernethy Road	Reconstruct and widen (4 lanes)
Redland Road	U199	Redland/Ferguson Road intersection	Install eastbound right-turn lanes and westbound left-turn lanes
Ferguson Road	U200	Redland Road to Maplelane Road	Remove or decrease horizontal curve along Redland Road, relocate intersection, install eastbound right-turn lanes and westbound left-turn lanes
Redland Road	U201	Redland/Bradley Road intersection	Install eastbound left turn and westbound right-turn lanes
Redland Road	U202	Redland/Grassle Road intersection	Remove bank and remove or decrease horizontal curve, relocate intersection

Project	ID	Location	Description
		intersection	relocate intersection
Fischers Mill Road	U203	Fischers Mill/Hattan Road intersection	Install eastbound left-turn lane
Redland Road	U204	Redland/Fischers Mill/Henrici Road intersection	Install eastbound left-turn lane and east and westbound right-turn lane at Henrici Road
OR 213	U208	Beavercreek/OR 213 intersection	Add dual left-turn lanes and ramps
Henrici Road	U210	OR 213 to Beavercreek Road	Widen lanes (3 lanes) and shoulders to County standards
Beavercreek Road - goes into rural area	U211	Leland Road to Henrici Road	Three lane widening
Sound End Road	U214	Warner Parrott Road to 99E	Widen 2 lanes and smooth curves
Springwater Road	U249	Hattan Road to Hayden Road	Reconstruct and widen (rural) (3 lanes)
Springwater Road	U250	Springwater/Bakers Ferry Road intersection	Install southbound left-turn lane
Springwater Road	U251	Springwater/Fischers Mill Road intersection	Perform special study, install southbound right-turn lane
Springwater Road	U252	Springwater/Redland Road intersection	Install northbound left-turn lane
Fellows Road	U260	Redland Road to Lower Highland Road	Reconstruct and widen (rural) (3 lanes)
Ridge Road	U261	Lower Highland Road to Redland Road	Reconstruct and widen (rural) (3 lanes)
Redland Road	U262	Henrici Road to Springwater Road	Reconstruct and widen (rural) (3 lanes)
Lower Highland Road	U263	Beavercreek Road to Fellows Road	Reconstruct and widen (rural) (3 lanes)
Unger Road	U264	Beavercreek Road to OR 211	Reconstruct and widen (rural) (3 lanes)
Beavercreek Road	U265	Beavercreek/Leland Road intersection	Add turn lanes
Casto Road	U269	Spangler Road to Central Point Road	Reconstruct and widen (rural) (3 lanes)
Spangler Road	U270	Casto Road to Beavercreek Road	Reconstruct and widen (rural) (3 lanes)
Airport Road	U276	Airport/Miley Road intersection	Realign, add turn lanes, install traffic signal
Airport Road	U277	Arndt Road to Miley Road	Reconstruct and widen (rural) (4 lanes)
Arndt Road	U279	Canby-Hubbard Highway to Knights Bridge Road	Four lane widening with median, left-turn lanes
Township Road	U290	Central Point Road to Canby City limit	Reconstruct and widen (rural) (3 lanes)
Mulino Road	U292	Mulino Road to 13th Avenue, intersection 23	Relocate intersection to south away from railroad trestle, change of stop control to 13th Avenue
Lone Elder Road	U294	Lone Elder/Barlow intersection	Add left-turn lanes
Canby-Marquam Highway	U295	Canby-Marquam Hwy/Lone Elder Rd intersection	Install northbound left-turn lane and southbound right-turn lane
Canby-Marquam Highway	U298	Canby-Marquam Hwy/ Macksburg Rd intersection	Install southbound left-turn lane and northbound right-turn lane
Dryland Road	U299	Macksburg Road (S) to Macksburg Road (N)	Realignment of Macksburg Road to form one intersection at Dryland Road
Macksburg Road	U300	Canby Marquam Hwy to OR 213	Reconstruct and widen (rural) (3 lanes)
Union Mills Road	U302	OR 213 to OR 211	Reconstruct and widen (rural) (3 lanes)

Project	ID	Location	Description
Molalla Avenue/ Vaughan (City of Molalla)	U311	OR 213 to OR 211	Reconstruct and widen (rural) (3 lanes)
Wright Road	U314	Feyrer Park Road to Callahan Road	Widen lane and shoulder widths to County standards
Fernwood Road	U316	Dhooghe Road to Callahan Road	Reconstruct and widen (rural) (3 lanes)
Dhooghe Road	U317	OR 211 to Fernwood Road	Reconstruct and widen (rural) (3 lanes)
Sawtell Road	U320	Maple Grove Road to Wilhoit Road	Reconstruct and widen (rural) (3 lanes)
Wildcat Road	U321	Wilhoit Road to OR 213	Reconstruct and widen (rural) (3 lanes)
Nowlens Bridge Road	U322	OR 213 to Maple Grove Road	Reconstruct and widen (rural) (3 lanes)
Blair Road	U323	Groshong Road to Maple Grove Road	Reconstruct and widen (rural) (3 lanes)
Bird Road	U325	Groshong Road to Wilhoit Road	Reconstruct and widen (rural) (3 lanes)
Maple Grove Road	U326	Nowlens Bridge Road to Sawtell Road	Reconstruct and widen (rural) (3 lanes)
Clackamas River Drive	U469	OR 213 to Springwater Road	Reconstruct and widen (rural) (3 lanes)
Holcomb Blvd	U473	Abernethy Rd - Bradley Rd	Reconstruct and widen (3 lanes)
Henrici Road	U475	Beavercreek Rd to Redland Rd	Widen lanes (3 lanes) and shoulder to County standards, remove or decrease horizontal and vertical curves, investigate 40 mph speed zone extension to east of Ferguson Rd
Beavercreek Rd	U476	OR 213 to Molalla	Widen to 5 lanes
Beavercreek Road	U477	OR 213 to Henrici Road	Widen to 5 lanes
Mattoon Road	U503	Fischers Mill Road to Redland Road	Widen lanes (3 lanes) and shoulders to County standards, remove or decrease vertical curves, remove or decrease horizontal curves north of Redland Road
Mulino Road (13th St segment)	U504	Ivy Street to OR 213	Widen to 3 lanes
Toliver Road	U505	Between OR 213 and Molalla Avenue	Install traffic signal, curb and sidewalk, widen and pave

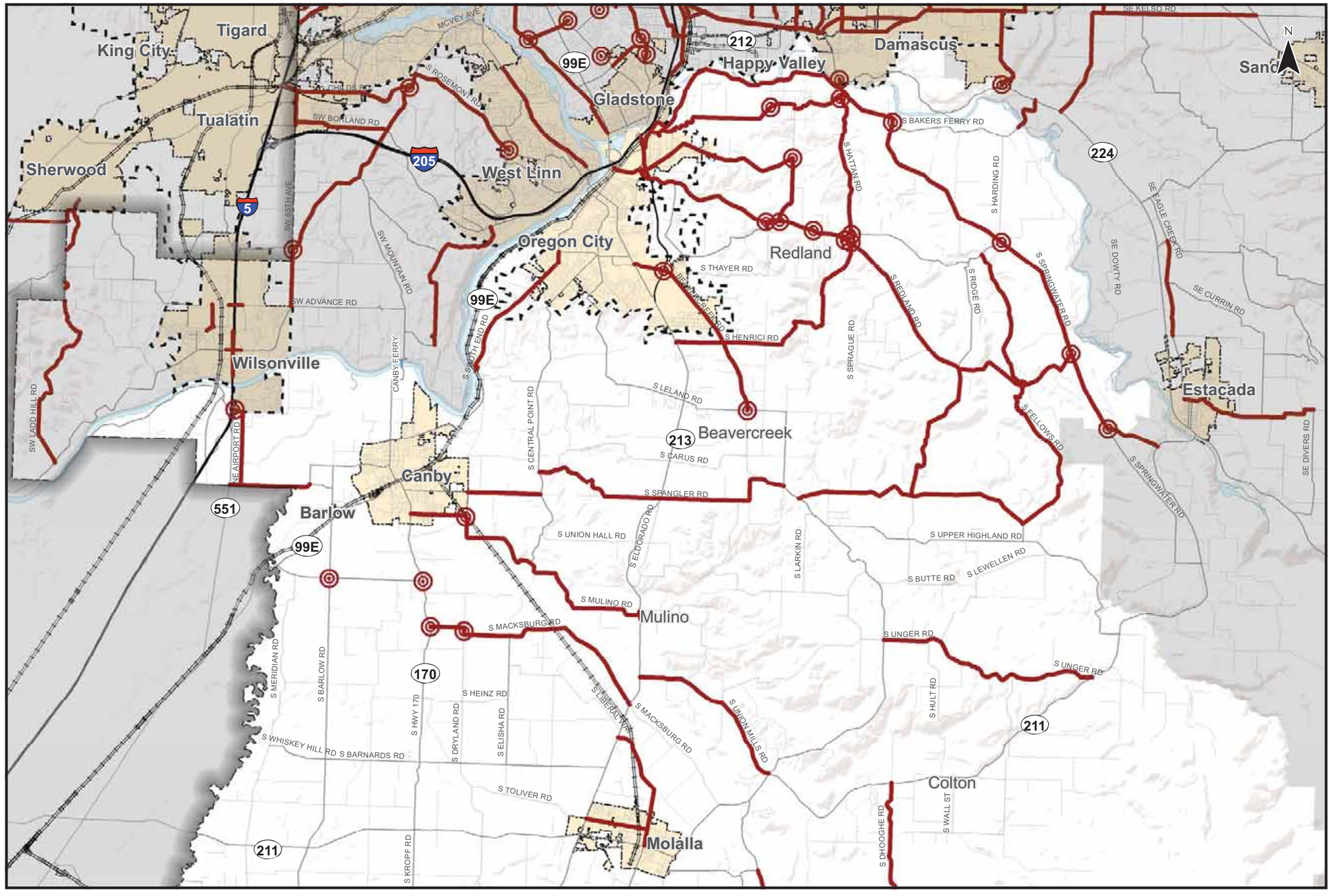
* Project also included in low build scenario

CLACKAMAS COUNTY TRANSPORTATION SYSTEM PLAN Update



Full Build Projects

- Intersection Projects
- Roadway Projects
- Incorporated Areas
- County Boundary
- UGB



This figure displays the projects included in the 2035 Full Build Scenario. The 2035 Full Build Scenario includes the existing planned projects in the County's current TSP and the Metro RTP. The purpose of analyzing the Full Build Scenario is to determine how transportation projects that are currently planned will improve future traffic operations. This will help identify which projects are necessary to address roadway and intersection operations that are below standard and which projects are located on facilities that are forecasted to perform above standards.

0 1 2 3 4 Miles

Coordinate System:
NAD 1983 HARN StatePlane Oregon North FIPS 3601 Feet Intl
Data Source:
Clackamas County, Metro Data Resouce Center

2035 Full Build Projects
Southwest County - Northern Portion

Figure
SN 38

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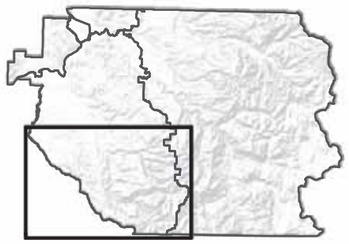
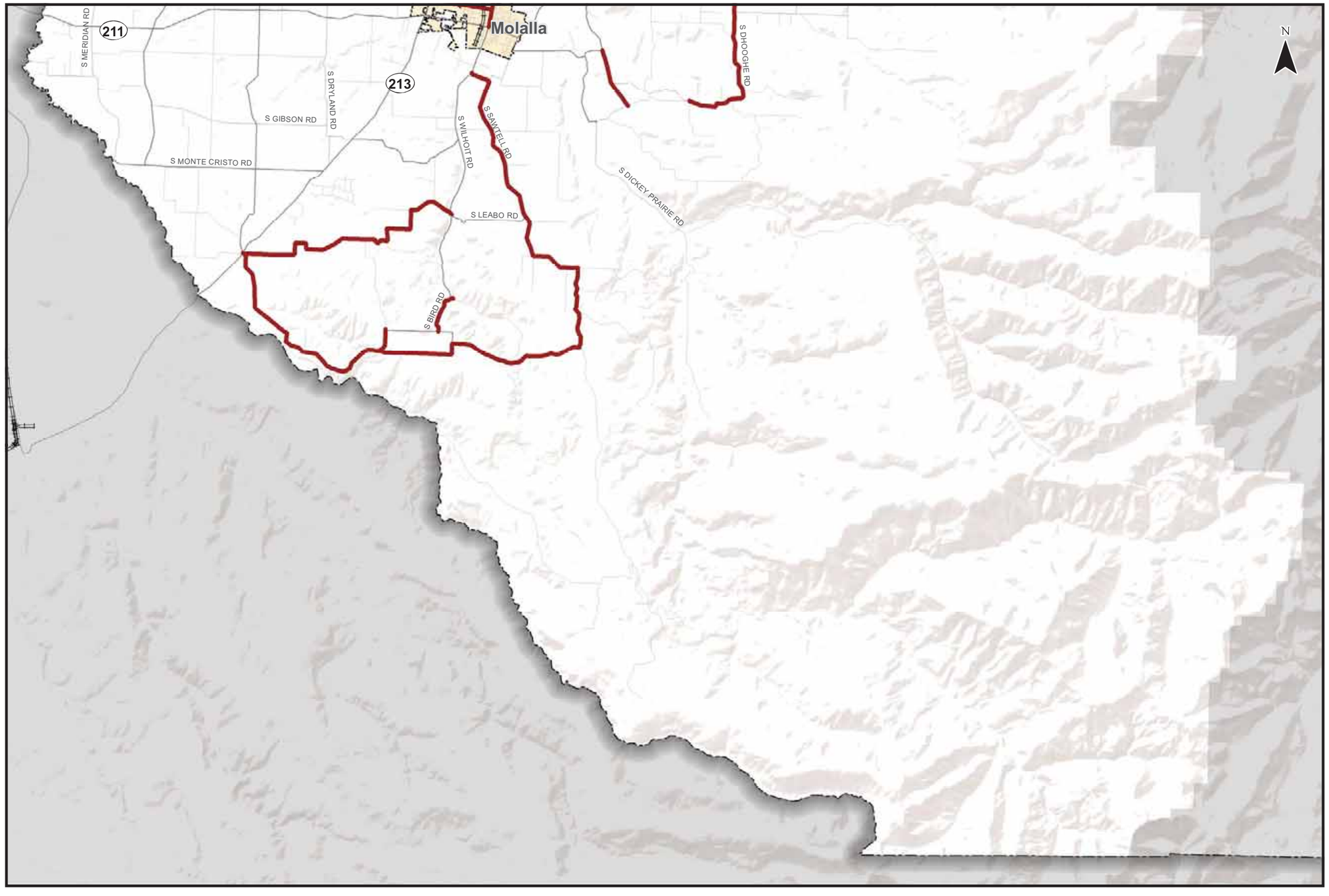
CLACKAMAS COUNTY TRANSPORTATION SYSTEM PLAN Update



Full Build Projects

- Intersection Projects
- Roadway Projects
- Incorporated Areas
- County Boundary
- UGB



This figure displays the projects included in the 2035 Full Build Scenario. The 2035 Full Build Scenario includes the existing planned projects in the County's current TSP and the Metro RTP. The purpose of analyzing the Full Build Scenario is to determine how transportation projects that are currently planned will improve future traffic operations. This will help identify which projects are necessary to address roadway and intersection operations that are below standard and which projects are located on facilities that are forecasted to perform above standards.

0 1 2 3 4 Miles

Coordinate System:
NAD 1983 HARN StatePlane Oregon North FIPS 3601 Feet Intl
Data Source:
Clackamas County, Metro Data Resouce Center

2035 Full Build Projects
Southwest County - Southern Portion

Figure
SS 38

H:\proj\lie\11732 - Clackamas County TSP\gis\11x17 Maps\38 2035 Full Build Projects.mxd

Study Intersection Analysis

The operations at the study intersections that do not meet standards under the low build scenario were analyzed under the full build scenario using traffic volumes projected under the full build scenario. Figure S 39 Figure S 39illustrates the lane configurations and traffic control devices at the study intersections. The intersections that meet standards under the low build analysis were not analyzed under the full build scenario.

The intersection operation results are shown in Table S 13 and Figure S 40, with intersections that do not meet standards noted. Any full build projects that affect lane configurations at study intersections were accounted for and are noted in the figure and table as well. Signal timings were adjusted as appropriate to account for changes in the forecast traffic volumes. Intersections that do not meet standards are noted.

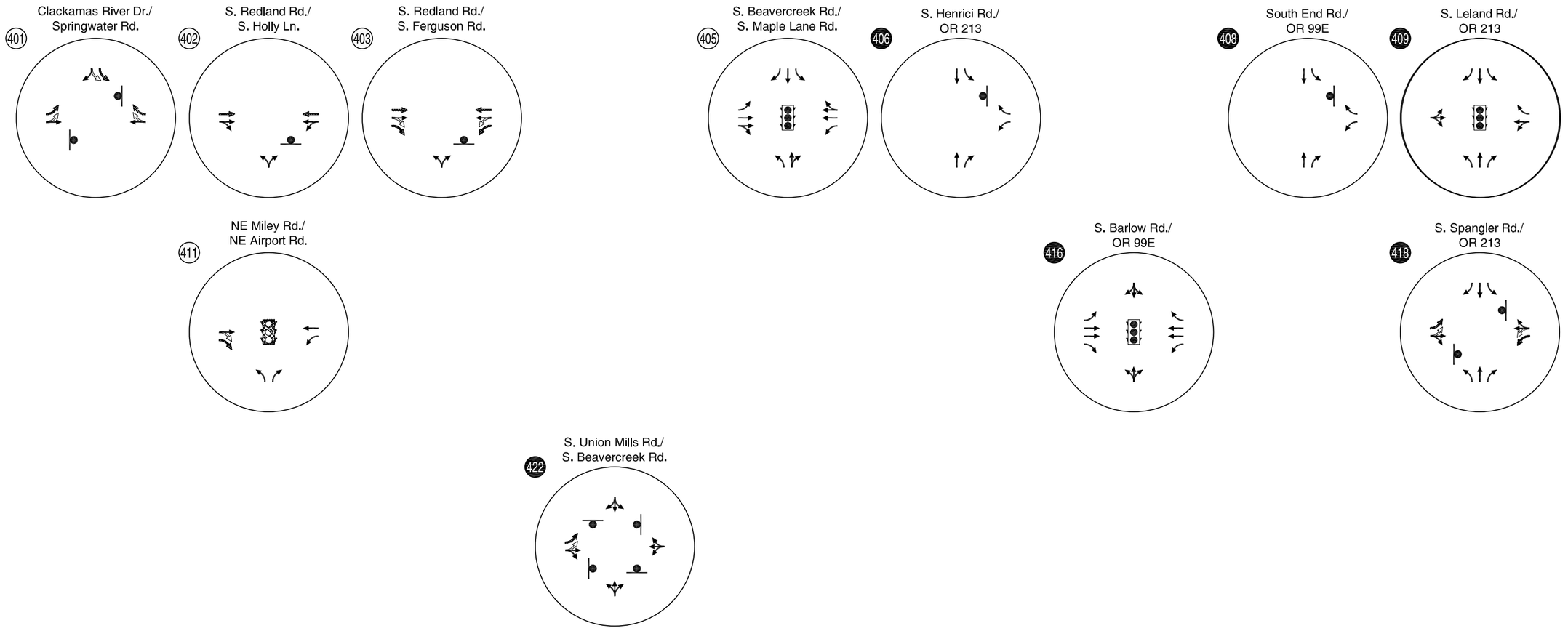
Table S 13 2035 Full Build Traffic Operations Analysis Results at Study Intersections in Southwest County

ID	Intersection	Jurisdiction	Performance Standard	Meets Standard in 2035 Low Build?	Full Build Project?	Meets Standard in 2035 Full Build?
401	Clackamas River Drive/Springwater Rd	County	LOS = D	No	Yes (U184, U469)	No (LOS F)
402	S. Redland Rd/S. Holly Lane	County	V/C = 0.99	No	Yes (U198)	No (v/c=1.66)
403	S. Redland Rd/S. Ferguson Rd	County	LOS = D	No	Yes (U198, U199)	No (LOS=F)
405	S. Beavercreek Rd/S. Maple Lane Rd	County	V/C = 0.99	No	Yes(U476, U477)	No (v/c=1.10)
406	S. Henrici Rd/OR 213	ODOT	V/C = 0.75	No	Yes (U210)	No (v/c=18.78)
408	South End Rd./OR 99E	ODOT	V/C = 0.75	No	Yes (U214)	No (v/c=0.99)
409	S. Leland Rd/OR 213	ODOT	V/C = 0.80	No	No	No (v/c=1.09)
411	NE Miley Rd/NE Airport Rd	County	LOS = D	No	Yes (U276, U277)	Yes
416	OR 99E/S. Barlow Rd	ODOT	V/C = 0.75	No	No	No (v/c=1.26)
418	S. Spangler Rd/OR 213	ODOT	V/C = 0.75	No	Yes (U270)	No (v/c=Err)
422	S. Union Mills Rd/S. Beavercreek Rd	ODOT	V/C = 0.75	No	Yes (U302)	No (v/c=1.10)

As seen in Table S 13, one intersection that does not meet standards under the low build scenario does meet standards under the full build scenario. The intersection of NE Miley Rd/NE Airport Road (411) is impacted by the widening of Airport Road and is signalized in the full build scenario. With these projects, operations at the intersection improve so that it operates above standards under the full build scenario.

Ten of the 11 intersections that do not meet standards under the low build scenario continue to not meet standards under the full build scenario.

Eight of these 10 intersections that do not meet standards under the full build scenario are impacted by capacity projects in the full build scenario. The majority of these projects involve reconstructing and widening rural roadways. As evidenced by the high volume-to-capacity ratios at many of the study intersections, particularly at S. Henrici Road/OR 213 (406) and S. Spanger Road/OR 213 (418), there is insufficient capacity at several intersections to meet increased travel demands projected for 2035 under the full build scenario. While there are several full build projects that add capacity to roadway segments, many of the study intersections are operating poorly. *Appendix 8* contains detailed traffic operations analysis results.



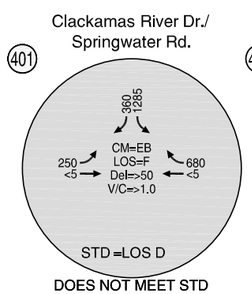
NOTE: THE FULL BUILD ANALYSIS WAS ONLY CONDUCTED ON THE INTERSECTIONS THAT DID NOT MEET STANDARDS IN THE LOW BUILD ANALYSIS

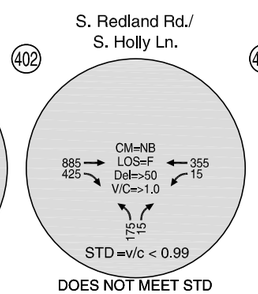
- ## - ODOT STUDY INTERSECTION
- (##) - COUNTY STUDY INTERSECTION
- - STOP SIGN
- - TRAFFIC SIGNAL
- - ROUNDABOUT
- ⇨ - LANE REMOVED
- → - LANE ADDED

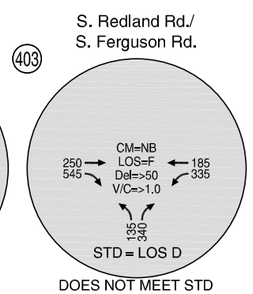
Full Build Lane Configuration and Traffic Control Devices Southwest County

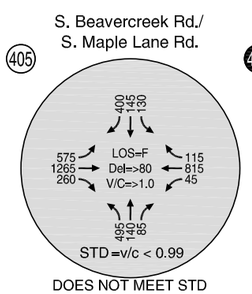
CLACKAMAS COUNTY Update
TRANSPORTATION SYSTEM PLAN

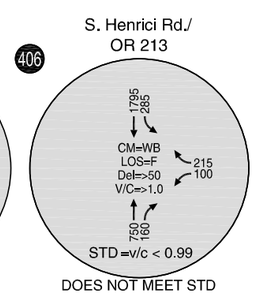
Figure S 39

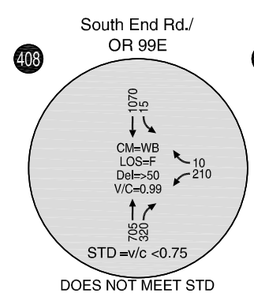


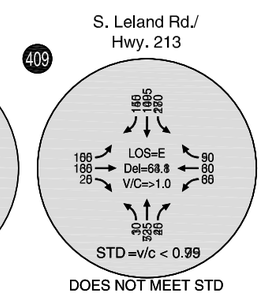


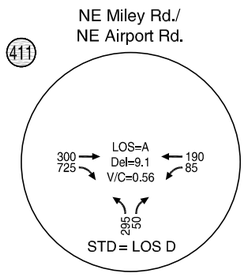


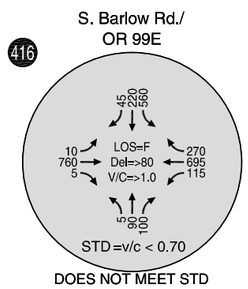


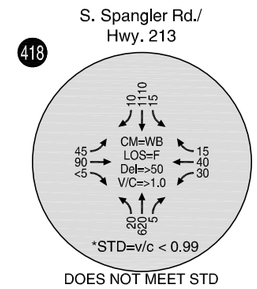


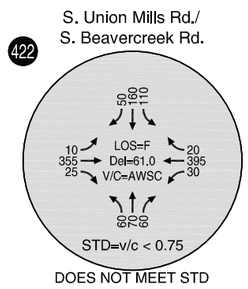












NOTE: THE FULL BUILD ANALYSIS WAS ONLY CONDUCTED ON THE INTERSECTIONS THAT DID NOT MEET STANDARDS IN THE LOW BUILD ANALYSIS

CM = CRITICAL MOVEMENT (UNSIGNALIZED)
LOS = INTERSECTION LEVEL OF SERVICE (SIGNALIZED)/CRITICAL MOVEMENT LEVEL OF SERVICE (UNSIGNALIZED)
Del = INTERSECTION AVERAGE CONTROL DELAY (SIGNALIZED)/CRITICAL MOVEMENT CONTROL DELAY (UNSIGNALIZED)
V/C = CRITICAL VOLUME-TO-CAPACITY RATIO
STD = OPERATIONAL STANDARD

Full Build Intersection Operations
PM Peak Hour
Southwest County

CLACKAMAS COUNTY Transportation System Plan Update

Figure S 40

Roadway Segment Analysis

The roadway segment operations analysis consists of considering the roadway segment volumes and approximate level of congestion based on a comparison of the volume to the segment capacity. *Section 3 Assumptions and Methods* provides additional details on the scope and approach to the analysis below.

Roadway Segment Volumes

The roadway segment volumes provide a sense of the demand for travel on the roadways. Figure S 41 illustrates the roadway link volumes from the weekday evening peak hour for the 2035 Full Build Scenario.

As is evident from Figure S 41, under the 2035 Full Build Scenario demand for travel continues to be highest along OR 213, OR 99E, S Beavercreek Road, S Redland Road, S Springwater Road, OR 170, and S Union Hill Road. These trends are consistent with the existing and 2035 Low Build scenarios.

Approximate Level of Congestion

The level of congestion experienced on roadway segments was estimated using the roadway segment volumes from the Metro model and the roadway segment capacity. The volume was compared to the capacity to calculate a volume-to-capacity ratio that is used to estimate level of congestion.

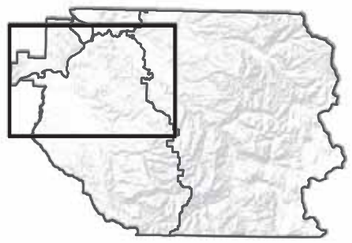
Figure S 42 illustrates the relative congestion during the 2035 Full Build weekday evening peak hour on roadways based on the estimated roadway segment volumes and capacity.

As can be seen in Figure S 42, under the 2035 Full Build Scenario many of the same segments experiencing congestion in the 2035 Low Build Scenario continue to experience some level of congestion in the 2035 Full Build Scenario. The primary difference is a lower degree of congestion on portions of OR 213, OR 99E, and S Beavercreek Road. Table S 14 lists the roadway segments that have volume-to-capacity ratios over 0.8 and describes the level of congestion as nearing congestion, some congestion, congested, or very congested.

Table S 14 2035 Full Build Roadway Segment Congestion in Southwest County

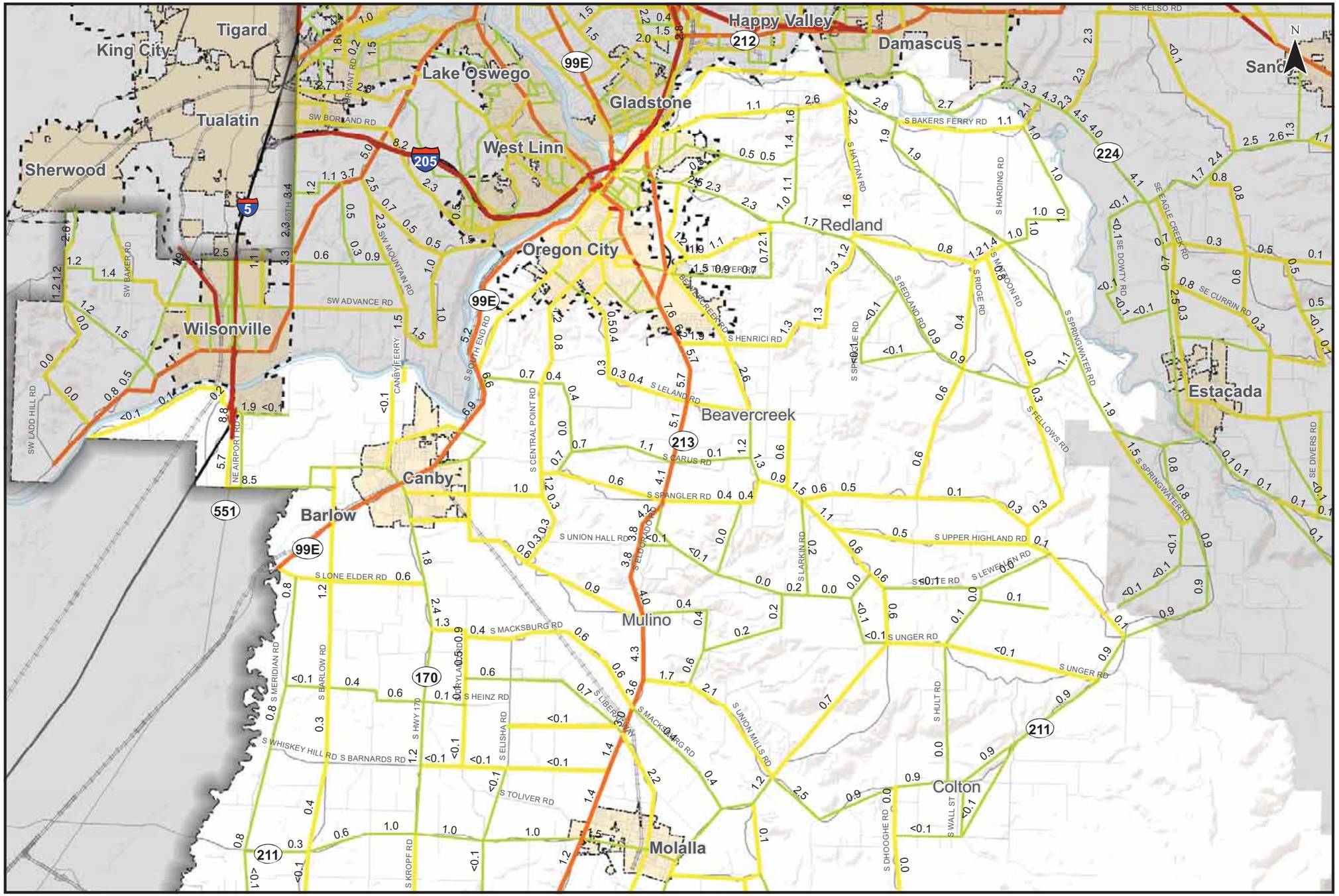
Roadway	Segment	Level of Congestion
OR 551	County Boundary to I-5	Very Congested
S Arndt Rd	OR 551 to S Barlow Rd	Very Congested
S Barlow Rd	OR 99E to S Arndt Rd	Very Congested
OR 213	S Carus Rd to Oregon City northern UGB Boundary	Nearing Congestion to Congested
S Knights Bridge	S Barlow Rd to N Holly St	Nearing Congestion to Congested
OR 99 E	North of S South End Rd	Some Congestion to Very Congested
S Central Point Rd	S Partflow Rd to Leland Rd	Nearing Congestion to Very Congested
S South End Rd	S Partflow Rd to north boundary of area	Very Congested
Beavercreek Rd	S Henrici Rd to S Thayer Rd	Nearing Congestion
S Hattan Rd	S Bakers Ferry Rd to North	Very Congested
S Bakers Ferry Rd	S Hattan Rd to S Springwater Rd	Nearing Congestion
S Ferguson Rd	S Walker Rd to S Redland Rd	Nearing Congestion to Some Congestion

CLACKAMAS COUNTY TRANSPORTATION SYSTEM PLAN Update



2035 Full Build Volumes

- Freeway
- Principal / Major Arterial
- Minor Arterial
- Oher
- #.# PM Weekday Traffic Volume in Thousands
- Incorporated Areas
- County Boundary
- UGB



0 1 2 3 4 Miles

Coordinate System:
NAD 1983 HARN StatePlane Oregon North FIPS 3601 Feet Intl
Data Source:
Cambridge Systematics, Clackamas County,
Metro Data Resouce Center

Evening Weekday Peak Hour Roadway Segment Volumes 2035 Full Build
Southwest County - Northern Portion

Figure
SN 41

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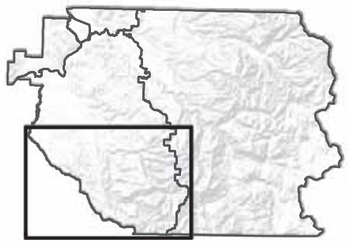
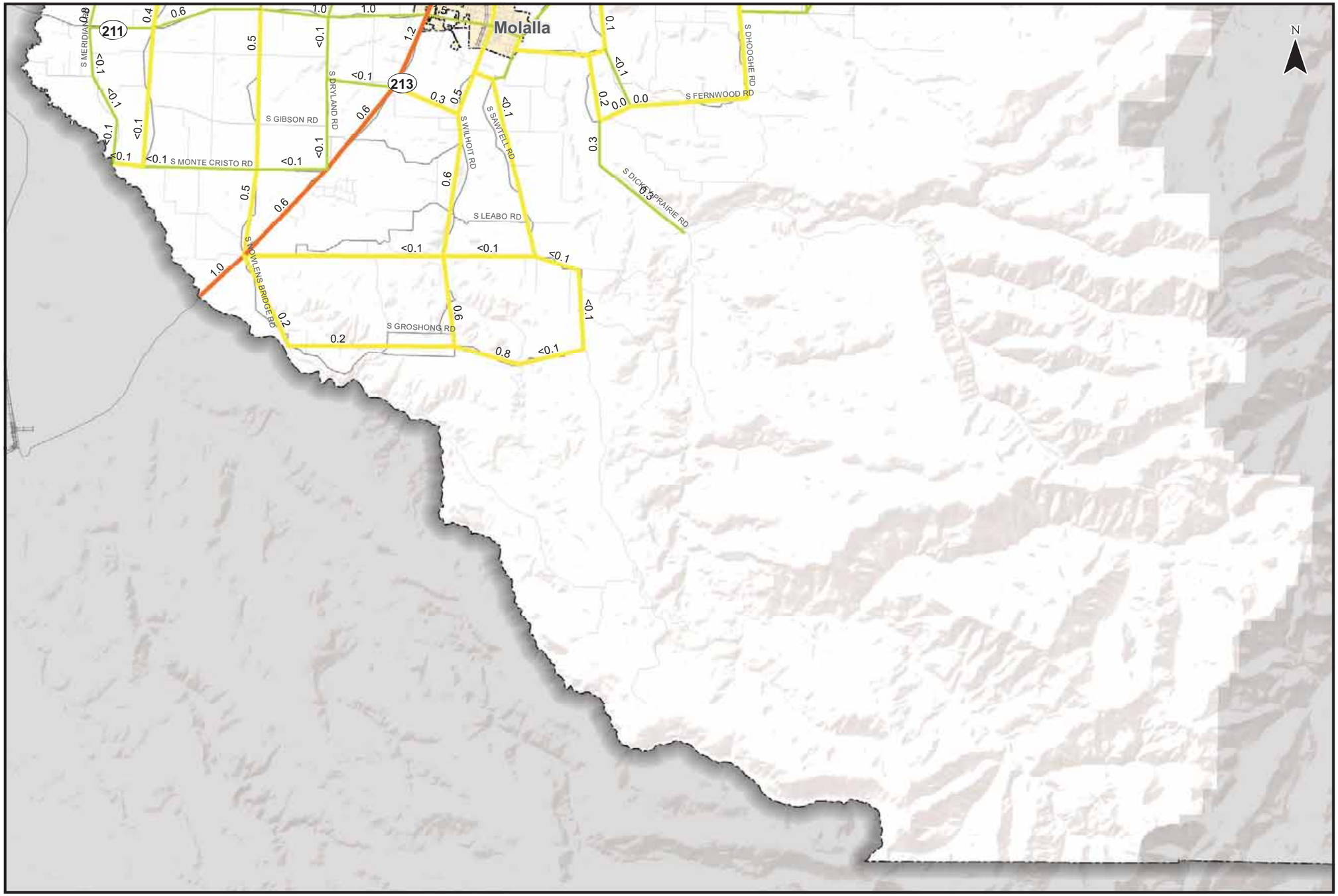
CLACKAMAS COUNTY TRANSPORTATION SYSTEM PLAN *Update*



2035 Full Build Volumes

- Freeway
- Principal / Major Arterial
- Minor Arterial
- Oher
- #.# PM Weekday Traffic Volume in Thousands
- Incorporated Areas
- County Boundary
- UGB



0 1 2 3 4 Miles

Coordinate System:
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Data Source:
Cambridge Systematics, Clackamas County,
Metro Data Resouce Center

Evening Weekday Peak Hour Roadway Segment Volumes 2035 Full Build
Southwest County - Southern Portion

Figure
SS 41

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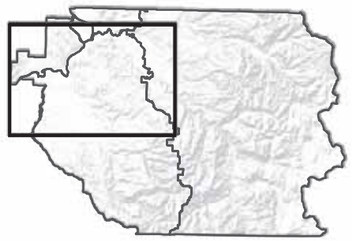
CLACKAMAS COUNTY TRANSPORTATION SYSTEM PLAN *Update*



Very Congested >1.10
- 1,000 Vehicles
- 5,000 Vehicles
- 10,000 Vehicles

Congested 1.0 - 1.1
- 1,000 Vehicles
- 5,000 Vehicles
- 10,000 Vehicles

Some Congestion 0.9 - 1.0
- 1,000 Vehicles
- 5,000 Vehicles
- 10,000 Vehicles

Nearing Congestion 0.8 - 0.9
- 1,000 Vehicles
- 5,000 Vehicles
- 10,000 Vehicles

Less Congested <0.8
- 1,000 Vehicles
- 5,000 Vehicles
- 10,000 Vehicles
- Incorporated Areas
- County Boundary
- UGB

0 1 2 3 4 Miles

Coordinate System:
NAD 1983 HARN StatePlane Oregon North FIPS 3601 Feet Intl
Data Source: Cambridge Systematics, Clackamas County, Metro Data Resouce Center

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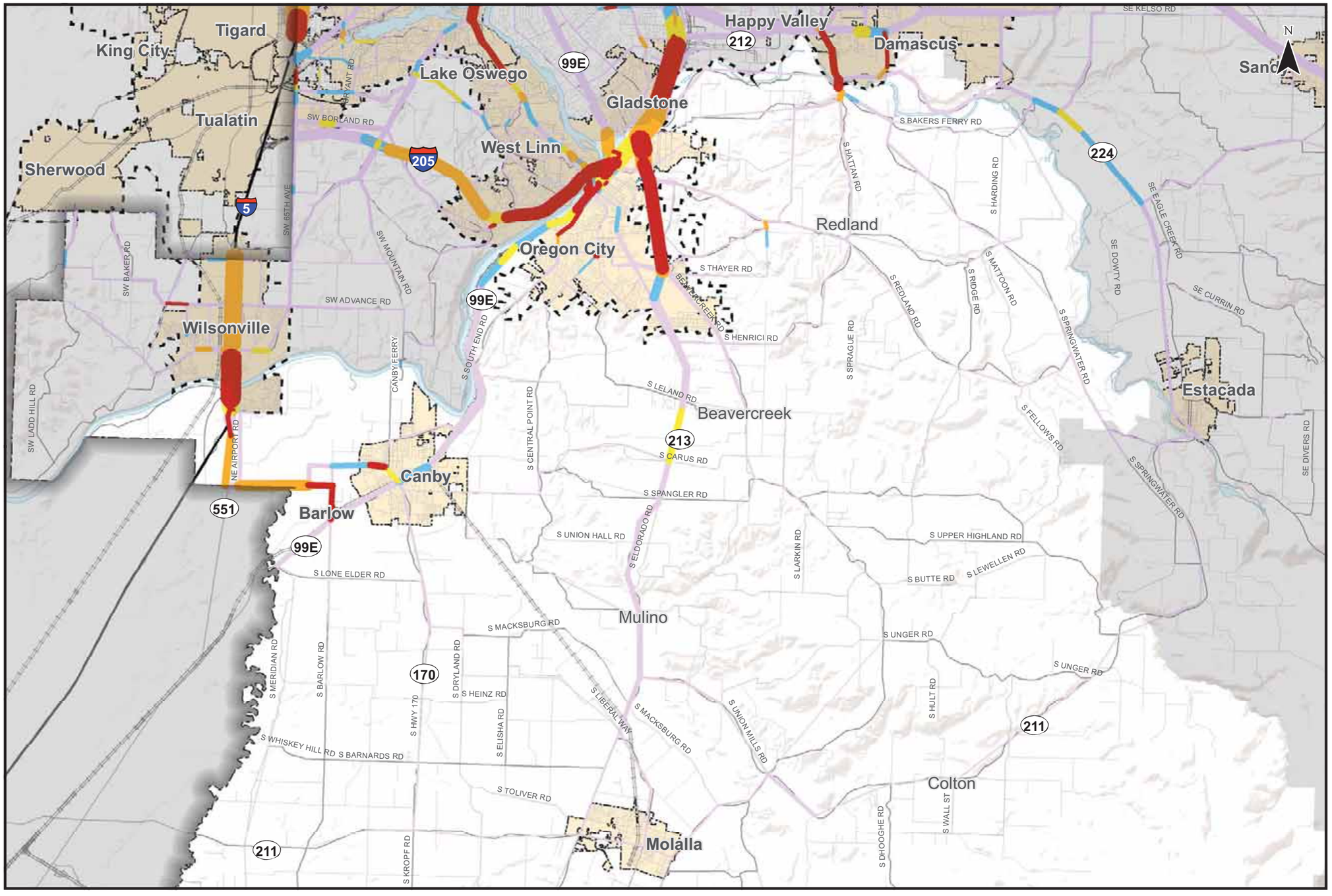
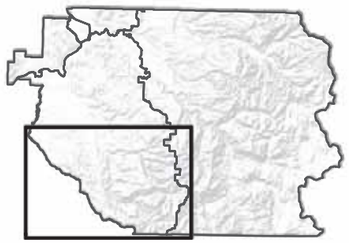


Evening Weekday Peak Hour Roadway Segment Congestion 2035 Full Build
Southwest County - Northern Portion

Figure
SN 42

CLACKAMAS COUNTY TRANSPORTATION SYSTEM PLAN *Update*



Very Congested >1.10
- 1,000 Vehicles
- 5,000 Vehicles
- 10,000 Vehicles

Congested 1.0 - 1.1
- 1,000 Vehicles
- 5,000 Vehicles
- 10,000 Vehicles

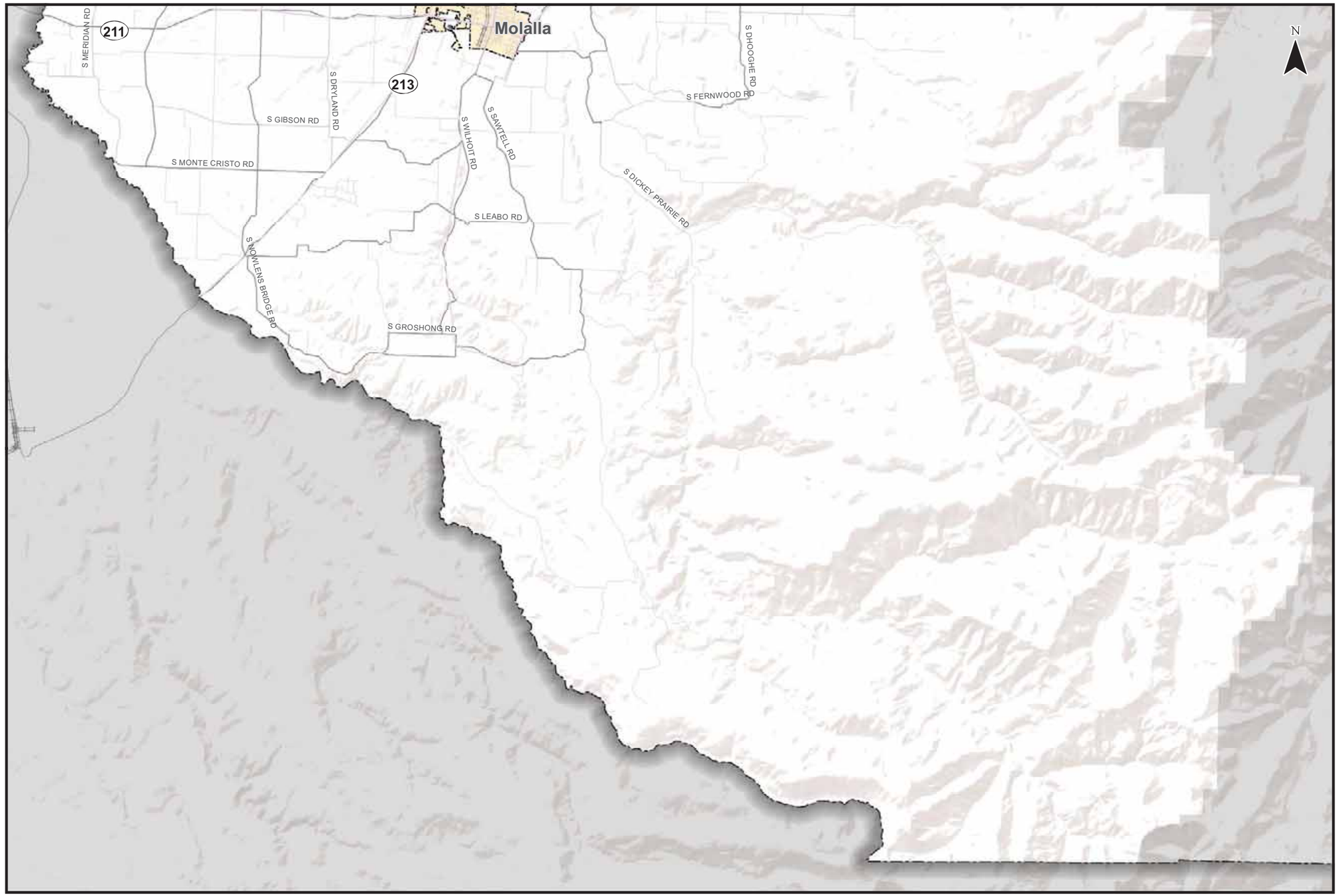
Some Congestion 0.9 - 1.0
- 1,000 Vehicles
- 5,000 Vehicles
- 10,000 Vehicles

Nearing Congestion 0.8 - 0.9
- 1,000 Vehicles
- 5,000 Vehicles
- 10,000 Vehicles

Less Congested <0.8
- 1,000 Vehicles
- 5,000 Vehicles
- 10,000 Vehicles
- Incorporated Areas
- County Boundary
- UGB

0 1 2 3 4 Miles

Coordinate System:
NAD 1983 HARN StatePlane Oregon North FIPS 3601 Feet Intl
Data Source: Cambridge Systematics, Clackamas County,
Metro Data Resouce Center



Evening Weekday Peak Hour Roadway Segment Congestion 2035 Full Build
Southwest County - Southern Portion

Figure
SS 42

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COMPARISON OF EXISTING, 2035 LOW BUILD, AND 2035 FULL BUILD ANALYSIS RESULTS

Traffic volumes are forecast to increase notably in Southwest County. There are very few transportation projects planned and financed under the low build scenario. The full build scenario includes several roadway projects, mainly reconstructing and widening rural roadways.

Intersection Operations Analysis

Table S 15 compares the intersection operation results for the existing, 2035 low build, and 2035 full build scenarios. The table also notes intersections that are impacted by low build and full build projects. As seen in the table, of the 10 study intersections that do not meet standards in the low build scenario, eight continue to not meet standards under the full build scenario. None of the intersections are directly impacted by low build capacity projects. Eight of the 10 intersections that do not meet standards under the low build scenario are impacted by full build capacity projects; of these, two meet standards under the full build scenario.

Table S 15 Comparison of Traffic Operations Analysis Results at Study Intersections in Southwest County

ID	Intersection	Jurisdiction	Performance Standard	Currently Meets Standard?	Low Build Project?	Meets Standard in 2035 Low Build?	Full Build Project?	Meets Standard in 2035 Full Build?
401	Clackamas River Dr/Springwater Rd	County	LOS =D	No	No	No	Yes	No
402	S. Redland Road/S. Holly Lane	County	V/C = 0.99	Yes	No	No	Yes	No
403	S. Redland Rd/S. Ferguson Rd	County	LOS = D	Yes	No	No	Yes	No
404	S. Redland Rd/S. Bradley Rd	County	LOS = D	Yes	No	Yes	-	-
405	S. Beavercreek Rd/S. Maplelane Rd	County	V/C = 0.99	Yes	No	No	Yes	No
406	S. Henrici Rd/OR 213	ODOT	V/C = 0.75	Yes	No	No	Yes	No
407	S. Henrici Rd/S. Beavercreek Rd	County	LOS = D	Yes	No	Yes	-	-
408	South End Rd./OR 99E	ODOT	V/C = 0.75	Yes	No	No	Yes	No
409	S. Leland Rd/OR 213	ODOT	V/C = 0.80	No	No	No	No	No
410	S. Leland Rd/S. Beavercreek Rd	County	LOS = D	Yes	No	Yes	-	-
411	NE Miley Rd/NE Airport Rd	County	LOS = D	Yes	No	No	Yes	Yes
412	Arndt Rd/NE Airport Rd	County	LOS = D	Yes	No	Yes	-	-
413	Knights Bridge Rd/S. Barlow Rd	County	LOS = D	Yes	No	Yes	-	-
414	Arndt Rd/Knights Bridge Rd	County	LOS = D	Yes	No	Yes	-	-
415	Arndt Rd/S. Barlow Rd	County	LOS = D	Yes	No	Yes	-	-
416	OR 99E/S. Barlow Rd	ODOT	V/C = 0.75	No	No	No	No	No
417	SE 13th Ave/S. Mulino Rd	County	LOS = D	Yes	No	Yes	-	-
418	S. Spangler Rd/OR 213	ODOT	V/C = 0.75	Yes	No	No	Yes	No
419	Mulino Rd/OR 213	ODOT	V/C = 0.80	Yes	No	Yes	-	-
420	S. Union Mills Rd/OR 213	ODOT	V/C = 0.75	Yes	No	Yes	-	-
421	S. Barnards Rd/OR 213	ODOT	V/C = 0.75	Yes	No	Yes	-	-
422	S. Union Mills Rd/S.	ODOT	V/C = 0.75	Yes	No	No	Yes	No

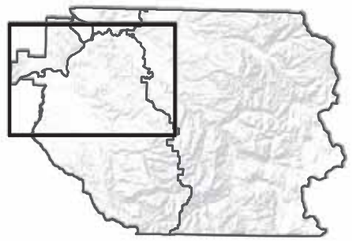
ID	Intersection	Jurisdiction	Performance Standard	Currently Meets Standard?	Low Build Project?	Meets Standard in 2035 Low Build?	Full Build Project?	Meets Standard in 2035 Full Build?
	Beavercreek Rd							
423	OR 211/Barlow Rd	ODOT	V/C = 0.75	Yes	No	Yes	-	-
424	OR 211/Canby Marquam	ODOT	V/C = 0.75	Yes	No	Yes	-	-

Roadway Segment Operations Comparison

Figure S 43 compares the approximate change in congestion between the 2035 Low Build Scenario and 2035 Full Build Scenario.

As shown in Figure S 43, implementing the full build projects decreases congestion (relative to low build scenario) on portions of OR 213, OR 99E, S Beavercreek Road, Arndt Road NE, OR 551, and S Redland Road. Congestion increases on a few relatively short segments of OR 170, OR 213, and OR 99E. The level of congestion on the vast majority of roadways does not change between the 2035 Low Build and 2035 Full Build scenarios.

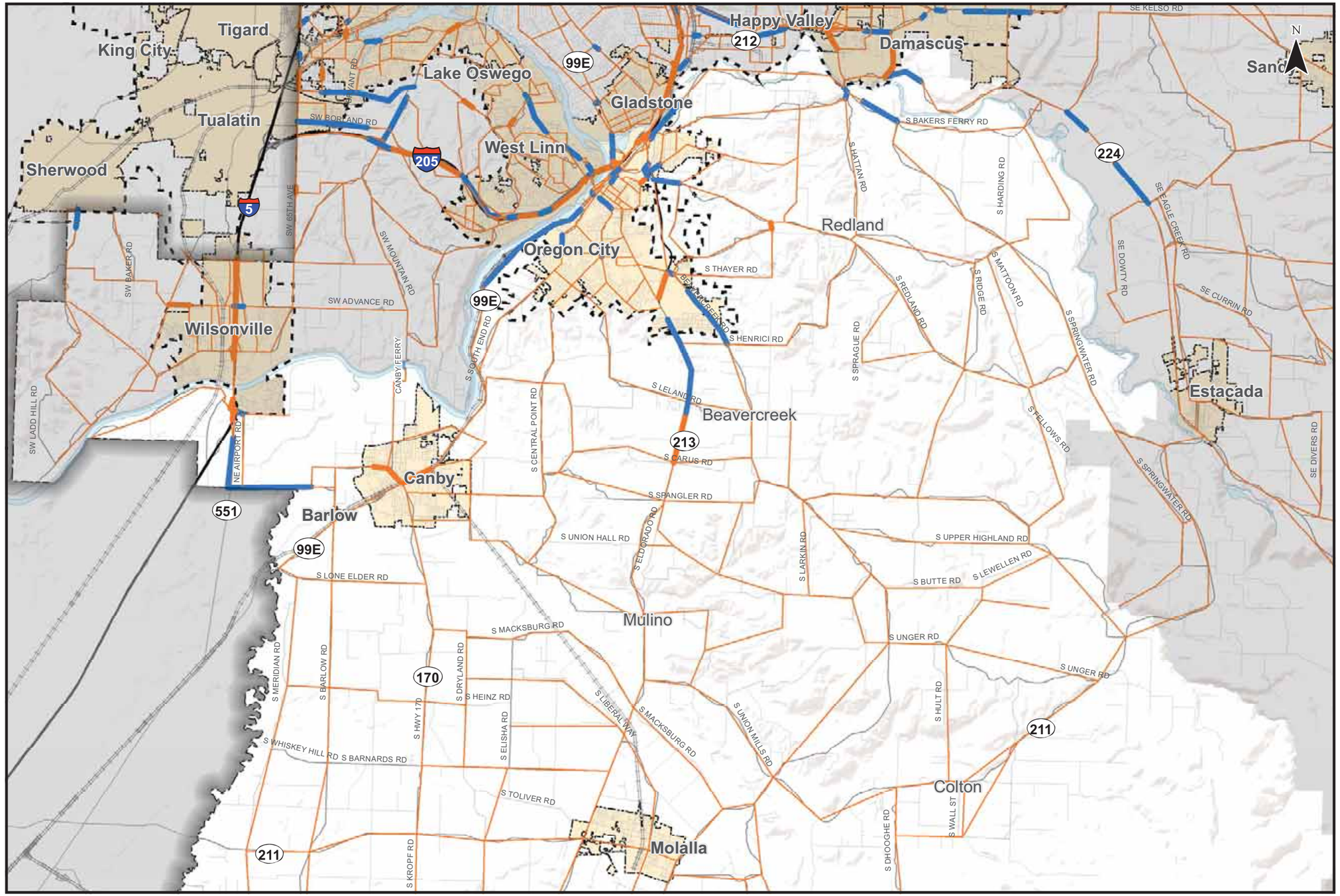
CLACKAMAS COUNTY TRANSPORTATION SYSTEM PLAN Update



Change in Congestion

Low to Full Build

- Congestion Increases
- Minimal Change
- Congestion Decreases
- Incorporated Areas
- County Boundary
- UGB



0 1 2 3 4 Miles

Coordinate System:
NAD 1983 HARN StatePlane Oregon North FIPS 3601 Feet Intl
Data Source:
Cambridge Systematics, Clackamas County,
Metro Data Resouce Center

Evening Weekday Peak Hour Roadway Segment Congestion Comparison of 2035 Low Build vs. 2035 Full Build Southwest County - Northern Portion

Figure
SN 43

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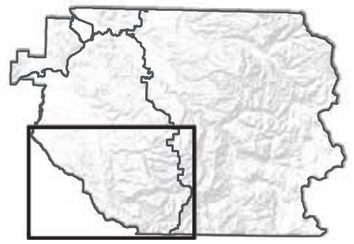
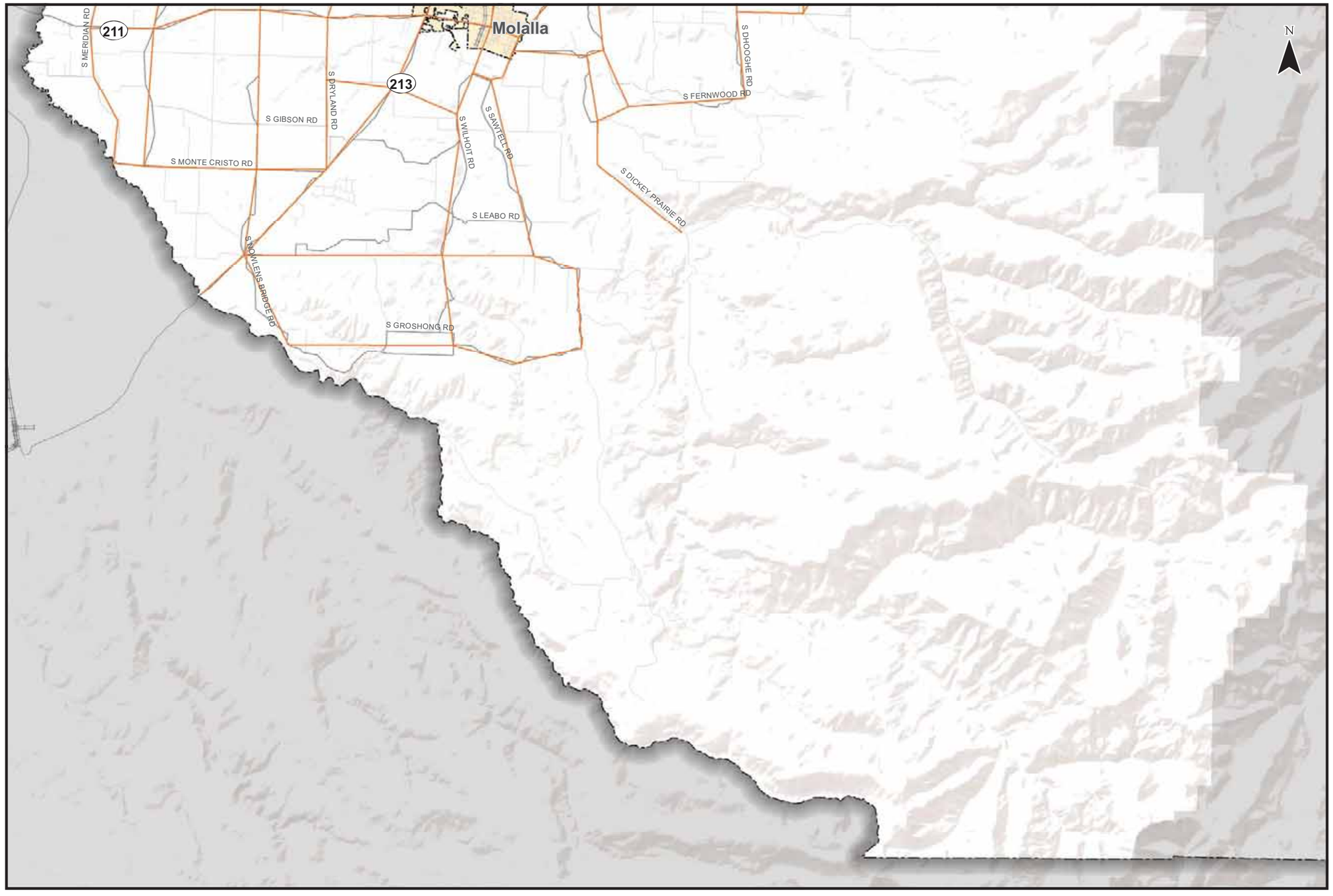
CLACKAMAS COUNTY TRANSPORTATION SYSTEM PLAN Update



Change in Congestion

Low to Full Build

- Congestion Increases
- Minimal Change
- Congestion Decreases
- Incorporated Areas
- County Boundary
- UGB



0 1 2 3 4 Miles

Coordinate System:
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Data Source:
Cambridge Systematics, Clackamas County,
Metro Data Resouce Center

Evening Weekday Peak Hour Roadway Segment Congestion Comparison of 2035 Low Build vs. 2035 Full Build Southwest County - Southern Portion

Figure
SS 43

H:\proj\file\11732 - Clackamas County TSP\gis\11x17 Maps\43 Evening Weekday Peak Hour Roadway Segment Congestion Comparison of 2035 Low Build vs.mxd